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AGRICULTURAL RECOVERY 2025: BALANCING EMERGENCY ACTION AND IRRIGATION REFORM

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Abstract
The 2025 floods have devastated Pakistan, particularly Punjab, destroying over 220,000 hectares of rice fields and damaging maize, livestock, and stored wheat stocks. With Punjab producing 77 percent of Pakistan's wheat, these losses have sparked an agricultural emergency that threatens rural livelihoods, food availability, and national economic stability. While proposals such as wheat imports, expanded subsidies, and market controls may offer short-term relief, they risk worsening fiscal pressures and creating long-term dependence.
This policy brief recommends a hybrid recovery strategy that combines immediate input support for farmers with structural investment in climate-resilient irrigation infrastructure, particularly, the gradual introduction of drip irrigation systems in flood-affected but high-potential districts. According to reports, it can save up to 70 percent of irrigation water and increase yields by 20–40 percent. Complementary measures, including seed distribution, canal rehabilitation, and digital subsidy tracking, can strengthen resilience and ensure transparent implementation. By anchoring recovery in sustainable irrigation and institutional reform, Pakistan can transform this crisis into an opportunity for long-term agricultural renewal, food security, and trade opportunity.

Context

Due to heavy monsoon rainspells since late June, cloudbursts, and recent water releases from overflowing dams of neighbouring countries, eastern Pakistan has faced record flooding, with some areas recording the worst flooding in over 40 years. These floods have caused immense deaths, widespread displacement, and destruction of infrastructure, farmland, crops, livestock, and food stocks across eastern Pakistan. But, more importantly these floods have triggered a nation-wide agricultural emergency. There have been many losses in crops, particularly for rice, and livestock across Punjab and neighboring provinces during the current Kharif season. Satellite-based analysis indicates that approximately 220,000 hectares of rice were flooded from August 1, 2025 to September 16, 2025[1]. Moreover, satellite-based analysis indicates that there has been a significant reduction in rice area in Punjab province as of September 5, 2025, compared to September 30, 2024, particularly over Sheikhupura and Faisalabad districts[1].

Flood damage to rice crops puts rural incomes at risk, as 60 percent of the population lives in rural areas[11]. Although rice is less significant than wheat in terms of domestic consumption, it serves as a major cash crop and is largely exported, especially Basmati rice from Punjab, so damage to these crops will further strain rural household incomes and disrupt local markets[3].

Maize is an important feed crop for livestock, with about 65 percent of maize produced used for poultry feed in Pakistan. Maize losses from the flooding will increase the future price of feed

and could have serious effects on poultry production[5, 6], and as a result can lead to loss of livestock. Livestock losses can have a serious impact on rural household incomes, impacting both direct earnings from the sale of animals and animal products, and benefits such as access to milk and meat for consumption and draught power and manure for farming[6].

Furthermore, food stocks, especially those from the recent 2024/25 Rabi wheat harvest, are crucial for maintaining household food security and overall availability. But they were likely impacted by the flooding. Wheat is Pakistan's staple food, covering 43.3 percent of the total planted agricultural area and comprising about 46 to 72 percent of the daily caloric intake. Pakistan is the eighth largest global wheat producer but not a major exporter because wheat is mostly consumed domestically[3, 6]. Flood damage to some storage facilities in Punjab has disrupted markets, causing sudden increases in wheat and flour prices by 40 percent in major cities, according to some estimates[7-10]. The impact of the flooding on the domestic food supply would most likely be a potential reduction for the upcoming 2025/26 Rabi wheat planting season, which starts in late September and early October. Many farmers lost vital agricultural inputs, including seeds and other supplies, and also considering the damage to irrigation infrastructure, farmers will likely need support to complete Rabi wheat planting. About 77 percent of Rabi wheat is grown in Punjab province, and about 70 percent of this wheat is grown under irrigation[11]. Unlike the 2022 floods in Pakistan, which mainly affected the provinces of Sindh and Balochistan, this raises huge concerns for Pakistan. A decrease in wheat yields can lead to shortage for the country, and therefore would raise a need to import these crops. In fact, Federal Minister of Pakistan Rana Tanveer Hussain has already announced that Pakistan may need to import $1.5 billion worth of wheat to fight shortages[13]. However, this shortage may not be immediately apparent, because surplus wheat from last season is currently in storage; nonetheless, if production does not recover, the country could face significant supply challenges in the near future. In such a situation, the country would also have to face record high inflations.

What's more, fields are still inundated in many areas, which will likely disrupt land preparation and planting activities. Lack of infrastructure and capital in the country also makes it harder to drain the water in time, forcing stakeholders to find other ways of dealing with the problem.

Policy Alternatives

Now, let's discuss a few policy alternatives and why they are not suitable for Pakistan specifically. Given the sudden decline in wheat output and growing fiscal pressures, a mix of short-term market interventions and targeted agricultural support measures will be considered.

According to Pakistan Flour Mills Association (PFMA) only immediate imports can prevent a food shortage in the near future. Industry leaders approximate a shortage of almost 1 to 1.5 million tons of wheat. They warn that without imports, next year's situation can be even more critical. And, Market controls add further strain: bread prices are fixed at Rs14, keeping wheat rates artificially low. Therefore, farmers have very little incentive to plant wheat and may shift to other crops, shrinking the supply even further. The government maintains reserves under food security programs, but millers argue this does not ease demand. They are calling for private imports to be allowed so that wheat can keep flowing into the market. All while the government continues to hold strategic stocks as a safeguard. For millers, the situation is urgent because without immediate action, flood damage, poor policies, and distorted markets can leave the country unable to meet flour demand[13]. Although the concern is genuine, large-scale private imports increase demand for U.S. dollars which will worsen Pakistan's already tight balance-of-payments position. The estimated $1.5 billion import plan[13] may strain reserves and add to the fiscal pressure. Also, import processes like tendering, shipping, customs clearance, and inland transport can take up to 6–10 weeks, meaning imported wheat may arrive after shortages have already affected domestic prices and planting cycles. Furthermore, If imported wheat enters the market at subsidized or lower prices, it can undercut domestic producers and discourage Rabi wheat planting for the following seasoning, deepening dependence on imports

next season, and thus trapping Pakistan into a vicious cycle.

To boost yields and make up for flood damage, the government is considering expanding input subsidies and voucher programs that provide farmers with discounted fertilizer, seeds, and irrigation fuel. The goal being to help affected farmers replant in time for the Rabi season and sustain national wheat output. Subsidies on urea and mechanization have already been increased under the 2025–26 budget to support food reserves and offset rising production costs[14], so this new policy can act as an extension to that. Although the intention is sound, such interventions have historically faced serious implementation flaws. Delays in input delivery often causes farmers to miss the sowing windows, not fulfilling the initial intended purpose. Similar past programs in Pakistan have also suffered from weak targeting and leakages, where benefits are captured by larger landholders rather than small or flood-affected farmers[15]. Moreover, these schemes place a heavy fiscal burden on an already strained budget and can reduce the amount of funds we can allocate for long-term resilience measures like irrigation repair and soil restoration. Furthermore, focusing solely on subsidies overlooks a critical issue: the severe damage to irrigation infrastructure caused by the floods. Additionally, while subsidies may help farmers replant, they do not inherently increase yield enough to compensate for the national wheat shortage.

To provide farmers with income security and ensure a steady domestic supply, the government could implement advance procurement or guaranteed offtake contracts for wheat. Under such a scheme, the state would commit to purchasing a fixed quantity of wheat at a predetermined price before harvest, protecting farmers from market volatility and encouraging them to keep planting wheat in the future despite flood-induced risks. This approach can stabilize rural incomes and reduce uncertainty in national food planning. However, such contracts are accompanied by major operational and fiscal challenges. Overestimating procurement targets may lead to excessive stockpiling, straining storage capacity and public finances; on the contrary, though, underestimation risks renewed shortages. Pakistan's public procurement agencies, like PASSCO and provincial food departments, already face issues of inefficiency, poor storage infrastructure, and delays in payment to farmers[14]. Moreover, guaranteed offtake can distort production incentives by encouraging wheat cultivation even in water-scarce or flood-prone areas, undermining diversification and long-term sustainability, and therefore resulting in a net loss rather than a net gain. Without careful forecasting and transparent implementation, advanced procurement is at risk of becoming another costly intervention with limited impact on real productivity gains.

To ensure sufficient supplies for human consumption, policymakers have considered temporarily restricting or banning the use of wheat in livestock and poultry feed, instead encouraging substitution with maize, rice bran, or other alternative feed sources. Such measures aim to prioritize food security amid the current production deficit and rising demands. Similar restrictions were briefly implemented in some provinces following the 2022 floods to stabilize flour availability[1]. While it seems rational, the policy is accompanied by several economic and operational risks. Restricting wheat use in feed directly raises input costs for the poultry and livestock sectors, which can cause higher meat and egg prices, intensifying food inflation. Moreover, enforcement across informal feed markets is very challenging because monitoring production and trade of feed ingredients is limited. And, substituting wheat with alternative feed ingredients is also not cost-neutral. Maize and bran prices may spike under new demand, transferring pressure to other supply chains rather than reducing pressure.

Another way to make up for the shortage is to release government-held wheat reserves into the market to moderate prices and stabilize supply. Agencies such as the Pakistan Agricultural Storage and Services Corporation (PASSCO) and provincial food departments maintain surplus stocks under food security mandates. Theoretically speaking, releasing a portion of these reserves can help make up for immediate shortages and help regulate prices in flour markets. However, reports following the 2025 floods suggest that some stored grain was damaged due to inundation and inadequate

storage facilities, reducing usable reserves[1]. Furthermore, overreliance on such releases risks depleting emergency reserves, leaving the country more vulnerable than ever if production does not recover. The process also faces issues of politicization and uneven distribution, where releases may favor certain regions or millers.

Policy Recommendation

Pakistan's response to the agricultural disruptions caused by the 2025 floods must balance immediate recovery with long-term resilience. Although short-term interventions such as wheat imports, seed subsidies, and input support can help stabilize supply, these measures alone cannot solve the deep vulnerabilities that leave our agriculture exposed to floods, droughts, and resource mismanagement.

This is a time when the country will be receiving millions of dollars in international aid, and it is important that these funds are used wisely, not just for immediate recovery but also for long term infrastructure that can resist such disasters in the future. So, the country requires a hybrid policy approach supporting farmers now in restoring production, while laying the foundation for a more efficient, water-secure, climate-resilient agricultural system based on international standards. At the heart of this hybrid policy should be the gradual but sustained introduction of drip irrigation, accompanied with targeted seed distribution, input assistance, and the repair and modernization of irrigation infrastructure.

Drip irrigation provides Pakistan the clearest opportunity to rebuild its agricultural capacity on stronger, more sustainable grounds. Field studies in rainfed areas of Punjab show that low-cost drip irrigation can save up to 86% of irrigation water and increase yields by 26-33% compared to furrow or flood irrigation for vegetables and fruits[16]. In sugarcane fields in Faisalabad, farmers using drip reported approximately 29.8% higher yields compared to conventional irrigation, while also reporting significant water and labour savings[17]. In other trials, drip systems delivered 50% or more water savings while increasing yield by over 20%, particularly for small-holder vegetables and orchard crops[16]. In crops like potato, sugarcane and citrus, yield increases under drip vs flood/furrow were reported to be ranged from 34% up to more than 100% in favourable circumstances[18].

These gains translate into rapid payback: one study reports that costs of low-cost drip sets (approximately Rs 50,000-150,000 per hectare) can be recovered in the second year of fruit or vegetable cropping[16]. Another source estimates installation costs of Rs 200,000-Rs 300,000 per acre for more full-scale systems in Punjab, with government subsidies of 60-75% helping reduce the burden on farmers[19]. According to private sector estimates from agricultural equipment suppliers, the total cost of installing drip irrigation systems can range between Rs 30,000 and 150,000 per acre, depending on existing on-farm infrastructure such as water source and pumping facilities (see Appendix E for more information). The Punjab government's existing subsidy scheme under the Punjab Irrigated Agriculture Productivity Improvement Project covers up to 60-75% of the upfront cost for drip irrigation systems[20].

At the same time, it is also worth mentioning that water use in agriculture in Pakistan is extremely inefficient. Around 93% of the country's water is used for agriculture, and more than 60% of that is lost during conveyance and at the farm level under flood/furrow systems[20]. Flood irrigation often requires double or more amounts of water compared to drip methods to achieve, in many cases, lower yields. Some regions report that applying drip instead of flood/furrow lowers water consumption by 30-50% while improving yields by 30-40%[20].

Based on these findings, a hybrid policy should begin by immediately identifying flood-affected but agriculturally promising districts such as Multan, Muzaffargarh, Dera Ghazi Khan and launching pilot drip-irrigation schemes covering for example 5-10% of their irrigated wheat areas in the first year. In Punjab, this amounts to tens of thousands of acres: even a 10% adoption in Punjab's wheat fields could save several billion cubic metres of water annually, while simultaneously raising yields by 25-40%[18]. Parallely, seed and fertilizer distribution must be scaled: certified high-germination wheat seed varieties, along with fertilizer subsidies, could help make up for yield losses by up to 20-30% in flood-affected areas.

Complementary to adoption of drip irrigation is the repair and rehabilitation of conveyance infrastructure. Canal desilting, field drainage improvement, lining of channels, and localized pumping can reduce the roughly 60% of the water loss occurring during conveyance and field application. Institutional strengthening will be crucial: extension services must be able to train farmers in drip system maintenance, fertigation, soil moisture monitoring; government departments should establish transparent digital tracking of subsidies and inputs to reduce corruption; and after-sales support such as spare parts, technical backup must be guaranteed, which has been a concern in multiple studies[17]. Under this design, even modest scaling over 2-3 years has phenomenal potential. For example, field trials show that water use efficiency under drip irrigation in fruits and vegetables can reach between 3.9-13.3 kg/m³, versus 1.3-5 kg/m³ under furrow systems[16]. For off-season vegetables grown under plastic tunnels, shifting from furrow to drip increased water productivity for capsicum by ~141%, cucumber by ~165%, hot peppers by ~109%, while yields rose by 20-30%, and net farm income increased 19-41%[21]. Ultimately, Pakistan's flood recovery efforts must do more than restore the status quo. Although seed distribution, fertilizer subsidies, and temporary imports will help, true food security depends on structural change. Anchoring recovery in drip irrigation, reinforced through infrastructure repair, input support, and institutional transparency offers the most credible and clear path. It can deliver yield boosts of 20-40% in targeted areas, water savings of 30-70%, and in majority of the cases a return on investment within 1-2 seasons. With proper scaling, Pakistan's farmlands can emerge from this crisis stronger, more productive, and more resilient to climate shocks, making it a blessing in disguise for the country.

Appendices

Appendix A: Estimated Impact of 2025 Floods on Major Crops

Crop	Estimated Flood-Affected Area (ha)	Share of National Output (%)	Key Provinces Impacted	Estimated Loss (tons)	Source
Rice	220,000	12.6	Punjab, Sindh	≈ 800,000	[1]
Maize	55,000	6.4	Punjab, KP	≈ 200,000	[4], [5]
Wheat (Storage Damage)	–	–	Punjab	≈ 30% of provincial stocks	[7], [8], [9]
Livestock	–	–	Punjab, Sindh	≈ 250,000 animals	[6]

Appendix B: Comparative Performance of Irrigation Systems in Pakistan

Irrigation Method	Average Water Savings (%)	Yield Increase (%)	Cost (PKR/acre)	Payback Period	Key References
Flood/Furrow	Baseline	–	–	–	–
Low-Cost Drip Systems	50–86	26–33	50,000–150,000 (per ha)	2 years	[16], [16]

Full-Scale Drip Systems	30–70	20–100	200,000–300,000	2–3 years	[17], [18], [19]
Private Sector Systems	—	—	30,000–150,000	—	Author's consultation (2025)

Appendix C: Cost-Sharing Framework for Drip Irrigation Subsidy

Stakeholder	Cost Share (%)	Description
Government of Punjab / Federal Grants	60–75	Subsidy on system installation under Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP).
Farmers / Cooperatives	15–30	Partial contribution through self-financing or cooperative pooling; ensures ownership and maintenance.
Donor / Development Partners / NGOs	10–15	Support for training, system monitoring, and performance evaluation.

Based on the Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP) framework[19] and consultation with private agricultural suppliers.

Appendix D: Projected Benefits of Scaling Drip Irrigation (Punjab)

Parameter	Conventional Irrigation	Drip Irrigation	% Improvement
Water Use Efficiency (kg/m³)	1.3–5.0	3.9–13.3	+160 to +200
Wheat Yield (tons/ha)	2.7–3.2	3.5–4.0	+25 to +35
Net Farm Income (Rs/acre)	70,000–85,000	90,000–120,000	+30 to +40
Water Savings (per year, 10% adoption)	—	5–6 billion m³	—
Payback Period	—	1–2 seasons	—

Appendix E: Summary of Expert Consultation

Consultation Date: September 2025

Respondent: Owner and Technical Lead, BioGreen Nature Tech (Pvt.) Ltd.

Summary:

The respondent highlighted that drip irrigation system costs in Punjab vary widely between Rs 30,000 and Rs 150,000 per acre depending on available farm infrastructure, particularly the presence of an existing water source and pumping facilities. Farmers with access to bore wells or canal outlets face significantly lower setup costs.

Appendix F: Acronyms and Abbreviations

Acronym	Full Form
PASSCO	Pakistan Agricultural Storage and Services Corporation
PFMA	Pakistan Flour Mills Association
PIPIP	Punjab Irrigated Agriculture Productivity Improvement Project
FAO	Food and Agriculture Organization
USDA	United States Department of Agriculture
FEWS NET	Famine Early Warning Systems Network

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