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# Gallup Pakistan Analysis of Punjab Development Statistics (50 Years)

## Agriculture

PRESS RELEASE

Gallup Pakistan Analysis of Punjab Development Statistics (50 Years)

# Punjab Agriculture Over Five Decades: Output Growth Driven by Irrigation Expansion, Input Intensification, and Yield Gains (1972–2021)

*Islamabad, February 27th, 2026*

Punjab's agricultural economy has undergone a profound transformation over the past half century. Drawing on official statistics spanning from 1971–72 to 2020–21, this analysis traces how Punjab transitioned from land-expansion-driven growth to a system increasingly defined by intensification, mechanization, chemical inputs, and institutional finance. The findings reflect long-term structural shifts rather than short-term fluctuations, offering a panoramic view of how Punjab sustained agricultural output under rising population pressure and environmental constraints.

## What is the Big Data Analysis Series by Gallup?

Gallup Pakistan's Big Data series was initiated by Bilal I. Gilani, Executive Director of Gallup Pakistan. As he explains: *"Pakistan does not suffer from a lack of data, but from limited accessibility and weak translation of numbers into understanding. Gallup Pakistan bridges this gap by analyzing large, often under-used datasets — from PSLM and Labour Force Surveys to Economic Surveys and National Census data — so these statistics can meaningfully inform policy and public discourse."*

## What data points this current edition covers:

This analysis is based exclusively on Agriculture Tables 1.1–1.22(b) from *Punjab Development Statistics for 50 Years (1972–2021)*, published by the Bureau of Statistics, Planning & Development Board, Government of the Punjab. The tables cover land utilization, rainfall, irrigation withdrawals, fertilizer and pesticide use, seed distribution, mechanization, agricultural credit, and crop-wise irrigation patterns across Punjab over five decades.

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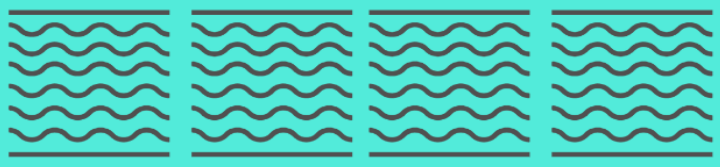
Punjab's agricultural growth over the past five decades has come primarily from intensifying land use rather than expanding cultivated area, with multiple cropping increasing sharply while net sown area remained largely unchanged.

## Rainfall Variability Reinforces Dependence on Irrigation

Rainfall patterns remained highly volatile, reinforcing Punjab's long-term dependence on irrigation and limiting the role of rain-fed agriculture in sustaining output growth.

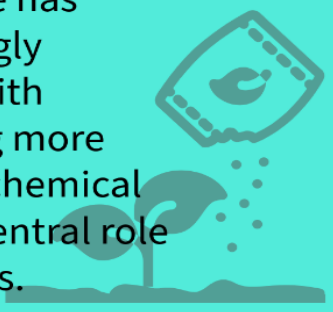
## Canal Withdrawals Reflect the Limits of Surface Water Expansion

Canal irrigation reached a plateau, prompting increasing reliance on groundwater and efficiency gains rather than expansion of surface water supplies.



## Fertilizer Use Signals a Shift Toward Chemical-Intensive Farming

Punjab agriculture has become increasingly input-intensive, with fertilizer use rising more than tenfold and chemical inputs playing a central role in sustaining yields.



## Improved Seeds and Pesticides Drive Yield-Focused Growth

The adoption of improved seeds expanded significantly, led overwhelmingly by wheat, strengthening productivity but also deepening dependence on purchased inputs.

*Mechanization transformed farm operations, with tractor numbers expanding rapidly and reshaping cultivation practices and labor use. Institutional agricultural credit grew exponentially, highlighting the increasing monetization of farming and the role of formal finance in supporting input-intensive agriculture. Irrigation coverage became near-universal for wheat and sugarcane, underscoring the centrality of assured water supply in Punjab's crop structure.*

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*Pakistan Bureau of Statistics (PBS), Labor Force Survey 2024–25.*

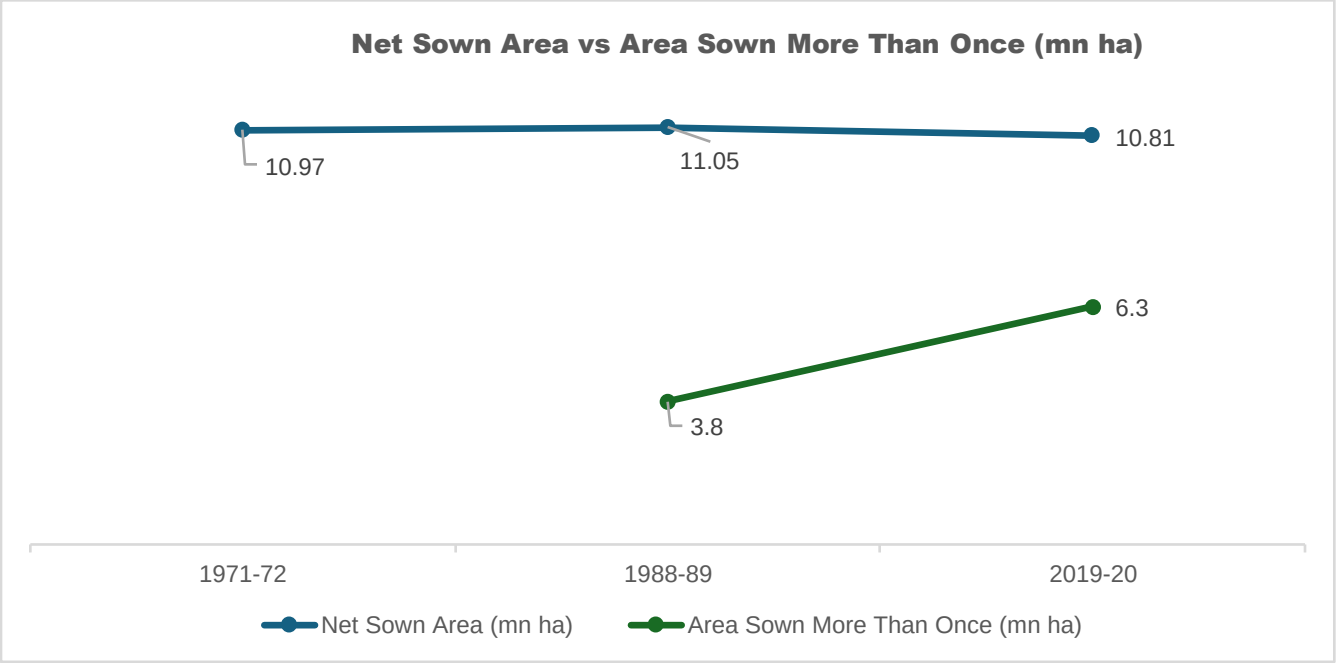
# Key Findings:

1. Punjab's agricultural growth over the past five decades has come primarily from intensifying land use rather than expanding cultivated area, with multiple cropping increasing sharply while net sown area remained largely unchanged.
2. Rainfall patterns remained highly volatile, reinforcing Punjab's long-term dependence on irrigation and limiting the role of rain-fed agriculture in sustaining output growth.
3. Canal irrigation reached a plateau, prompting increasing reliance on groundwater and efficiency gains rather than expansion of surface water supplies.
4. Punjab agriculture has become increasingly input-intensive, with fertilizer use rising more than tenfold and chemical inputs playing a central role in sustaining yields.
5. The adoption of improved seeds expanded significantly, led overwhelmingly by wheat, strengthening productivity but also deepening dependence on purchased inputs.
6. Pesticide use increased dramatically, reflecting intensified cropping systems and rising pest pressures across major crops.
7. Mechanization transformed farm operations, with tractor numbers expanding rapidly and reshaping cultivation practices and labor use.
8. Institutional agricultural credit grew exponentially, highlighting the increasing monetization of farming and the role of formal finance in supporting input-intensive agriculture.
9. Irrigation coverage became near-universal for wheat and sugarcane, underscoring the centrality of assured water supply in Punjab's crop structure.

## 1. Land Use Patterns Reveal Intensification Without Expansion

Over the past five decades, Punjab's agricultural land base has remained remarkably stable, underscoring the structural limits within which the province's farm sector has operated. Reported area consistently hovered around 17.5 million hectares, while the net sown area fluctuated narrowly between roughly 10.8 and 11.2 million hectares from the early 1970s through 2020. This stability indicates that Punjab's agricultural growth was not driven by the conversion of new land for cultivation, but rather by increasing the intensity with which existing land was used.

The most telling indicator of this shift is the steady rise in cropping intensity. Area sown more than once expanded substantially, from about 3.8 million hectares in the late 1980s to more than 6.3 million hectares by 2019–20. This expansion reflects the widespread adoption of double- and triple-cropping systems, made possible through irrigation, mechanization, and faster crop turnaround times. At the same time, uncultivated cultivable waste declined gradually, suggesting improved land management and reduced idle capacity. Together, these trends highlight a transition toward maximizing output per hectare rather than expanding the agricultural frontier.

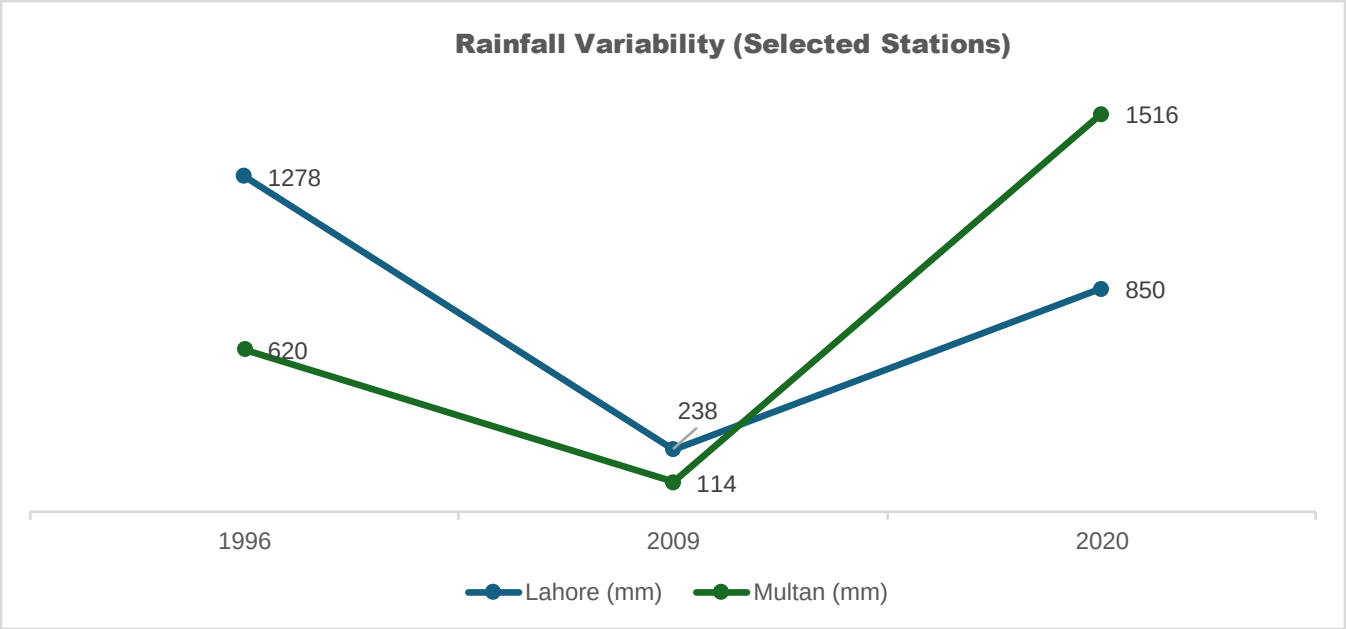



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

### 2. Rainfall Variability Reinforces Dependence on Irrigation

Rainfall patterns across Punjab over the past five decades reveal pronounced volatility rather than long-term improvement. Data from major stations such as Lahore, Multan, Faisalabad, and Sargodha show sharp year-to-year fluctuations, with some years receiving more than double the rainfall of others. For example, Lahore's annual rainfall ranged from under 250 millimeters in dry years to well over 1,200 millimeters during exceptionally wet periods, while Multan exhibited even greater variability.

This unpredictability severely constrained the reliability of rain-fed agriculture and reinforced Punjab's dependence on controlled irrigation systems. The absence of a consistent upward rainfall trend meant that farmers could not rely on climatic improvements to stabilize yields. Instead, risk management increasingly depended on irrigation infrastructure and groundwater extraction, shaping both crop choices and farming practices across the province.

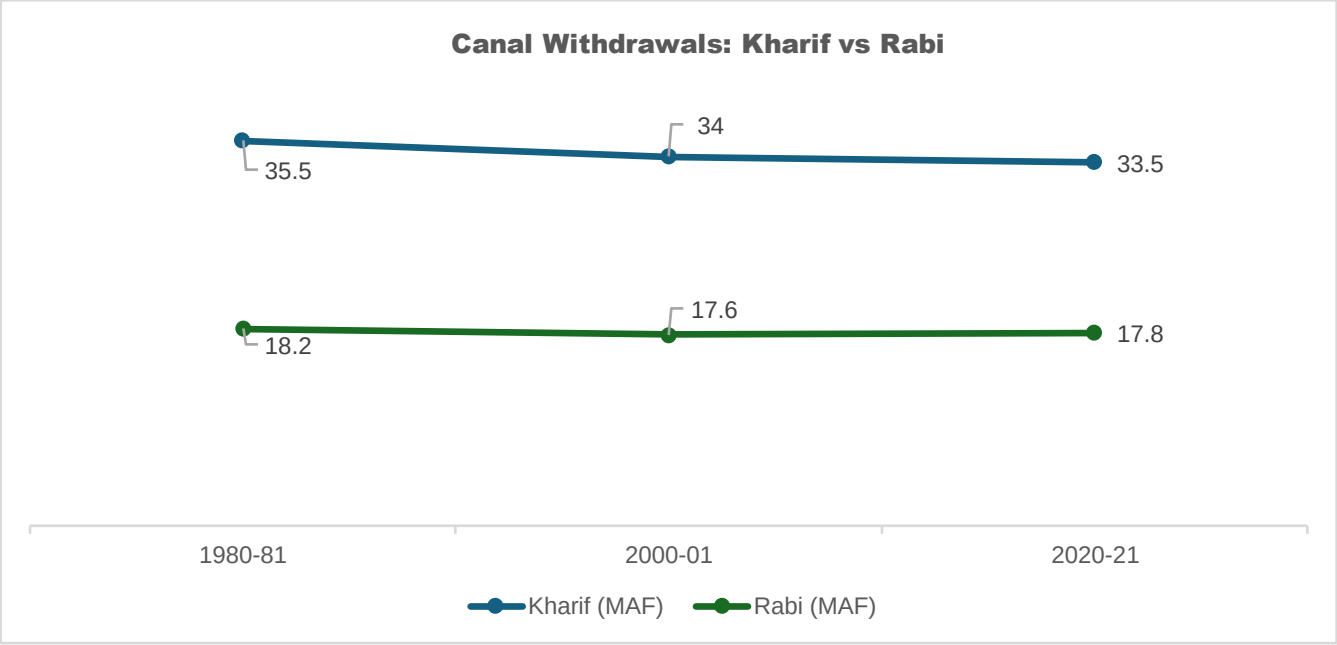



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

### 3. Canal Withdrawals Reflect the Limits of Surface Water Expansion

Canal withdrawal data reveal that Punjab reached the upper limits of surface water utilization relatively early in its agricultural development trajectory. Kharif canal withdrawals rose steadily through the 1970s and early 1980s, crossing 35 million acre feet at their peak, before gradually declining and stabilizing around 33–34 million acre feet by 2020–21. A similar pattern is visible in Rabi withdrawals, which settled near 17–18 million acre feet after periods of fluctuation.

This long-term stabilization suggests that canal irrigation expansion could not keep pace indefinitely with rising agricultural demand. As surface water supplies plateaued, farmers increasingly compensated through tubewell irrigation and groundwater pumping. The data therefore reflect a structural shift from canal-led expansion to a mixed system where groundwater became a critical buffer against water shortages, especially during dry years.

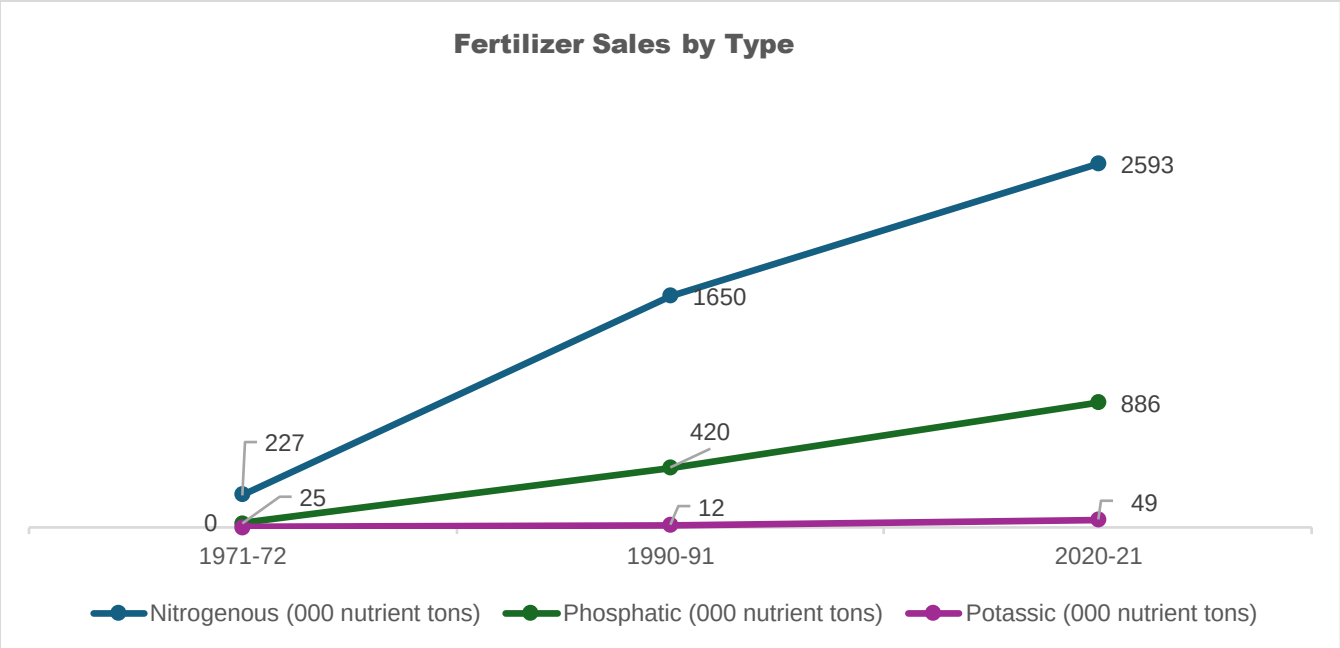



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

### 4. Fertilizer Use Signals a Shift Toward Chemical-Intensive Farming

The evolution of fertilizer use in Punjab provides one of the clearest indicators of agricultural intensification. In the early 1970s, fertilizer application was modest, with nitrogenous fertilizer consumption at just 227 thousand nutrient tons and phosphatic fertilizer use at 25 thousand nutrient tons. Over time, these figures rose dramatically, reaching 2,593 thousand nutrient tons for nitrogen and 886 thousand nutrient tons for phosphates by 2020–21.

This exponential increase reflects the widespread adoption of high-yielding crop varieties that require heavier nutrient inputs to achieve optimal yields. Potassic fertilizer use, negligible for decades, also gained importance in later years, signaling greater attention to balanced fertilization. While these trends supported higher output, they also introduced new challenges related to soil health, nutrient runoff, and rising input costs, making fertilizer management a central issue for sustainable agriculture in Punjab.

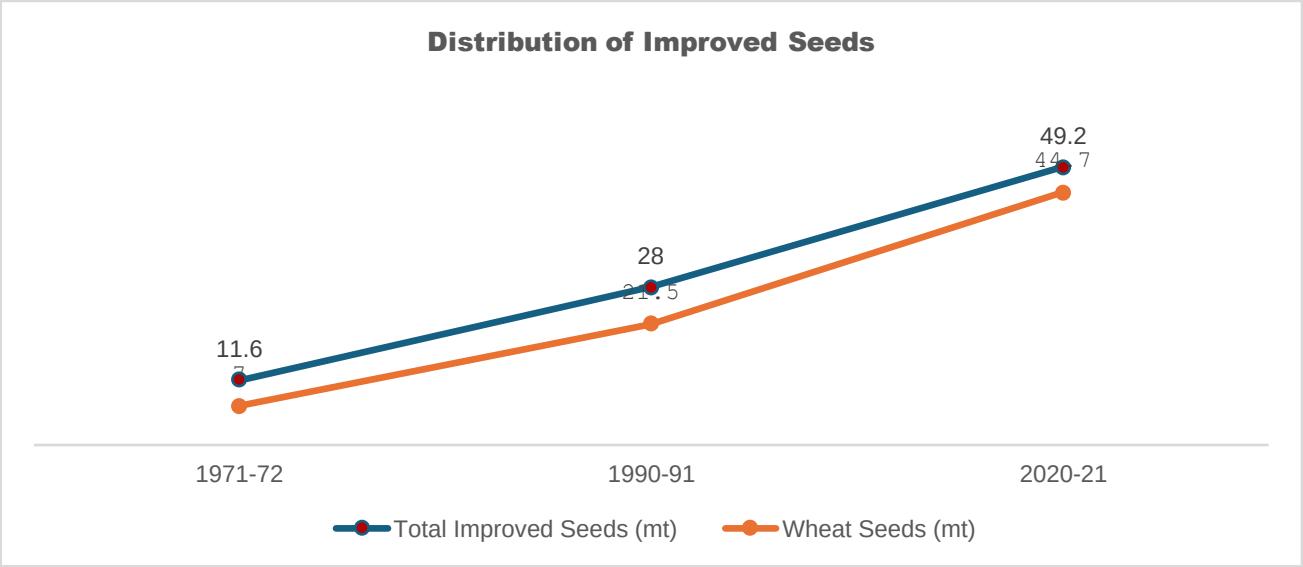



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

## 5. Improved Seeds and Pesticides Drive Yield-Focused Growth

Punjab's agricultural modernization was strongly driven by the diffusion of improved seeds. Total distribution of indigenous improved seeds rose more than fourfold, from about 11.6 thousand metric tons in 1971–72 to over 49 thousand metric tons by 2020–21. Wheat dominated this expansion, with seed distribution increasing from just over 7 thousand metric tons to nearly 45 thousand metric tons, reflecting wheat's central role in food security and farm incomes.

Parallel to seed adoption, pesticide use expanded sharply, highlighting the growing chemical intensity of crop protection. The area treated with pesticides increased from less than half a million hectares in the early 1970s to more than 28 million hectares by 2020–21. This surge reflects both the spread of monocropping systems and increasing pest resistance, making chemical control an integral—though increasingly costly—component of modern farming in Punjab.

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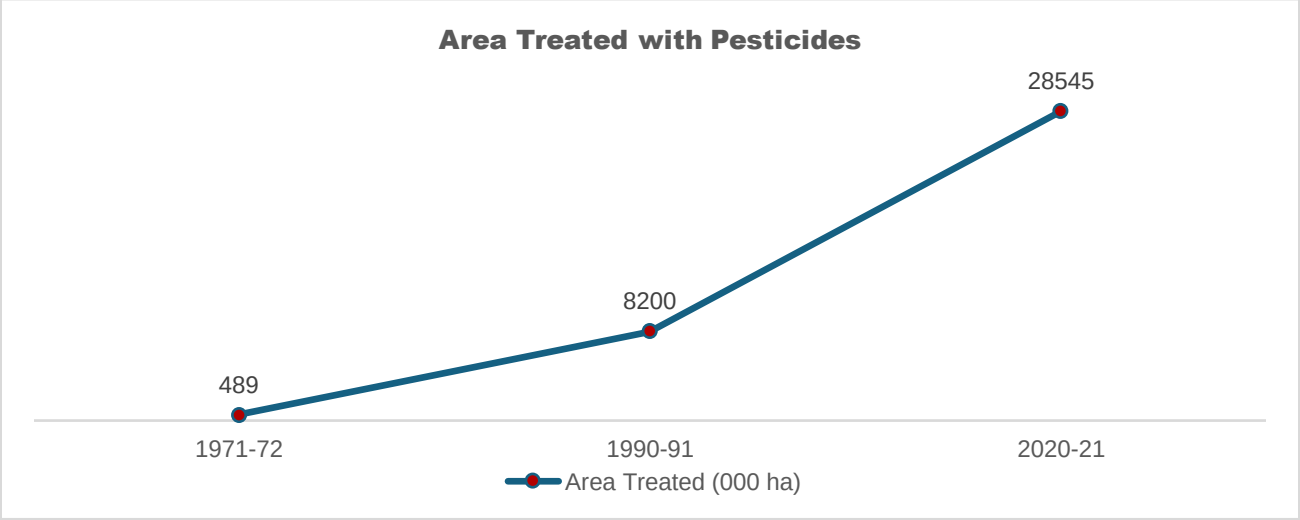
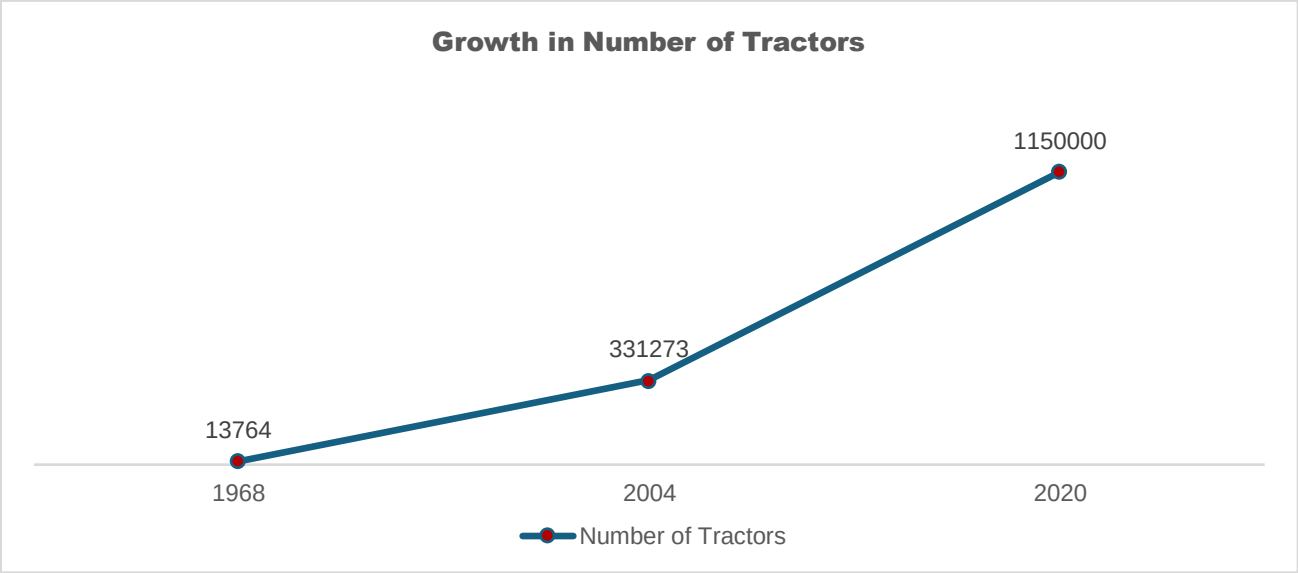



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

## 6. Mechanization Reshapes Farm Operations

Mechanization fundamentally altered the scale and efficiency of agricultural operations in Punjab. Tractor numbers grew from fewer than 14 thousand in 1968 to over 330 thousand by 2004, before accelerating further to more than 1.15 million by 2020. This growth enabled faster land preparation, timely sowing, and more efficient harvesting, particularly critical for multi-cropping systems.

The expansion of mechanization also translated into a dramatic increase in the physical area serviced by tractors. By 2004, tractors covered more than 8.4 million hectares, compared to just 1.3 million hectares in 1968. These changes reduced reliance on animal power and manual labor, reshaped rural labor markets, and increased capital intensity across Punjab's farm sector.

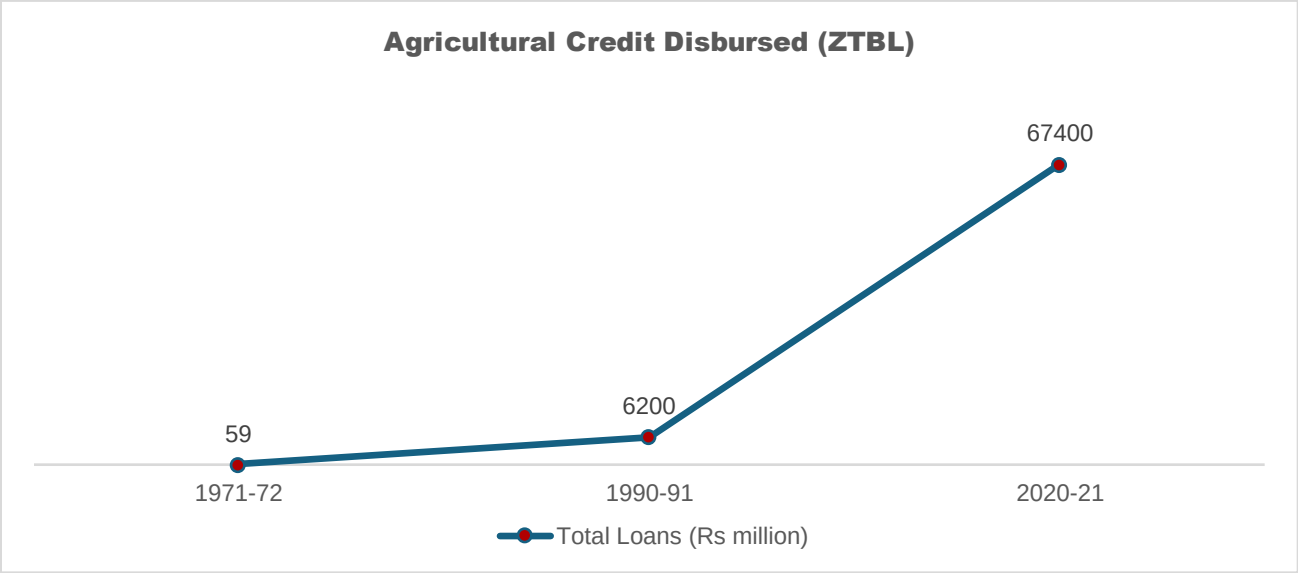



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

## 7. Agricultural Credit Expands at an Unprecedented Scale

Institutional finance emerged as a cornerstone of Punjab's agricultural transformation. Agricultural loan disbursements by Zarai Taraqiati Bank Limited rose from a modest Rs 59 million in 1971–72 to Rs 6.2 billion by the early 1990s, eventually reaching Rs 67.4 billion by 2020–21. This expansion mirrors the rising cash requirements of farming, driven by fertilizers, pesticides, machinery, and improved seeds.

Short-term loans accounted for the bulk of disbursements, indicating that farmers increasingly relied on formal credit to finance seasonal inputs rather than long-term capital alone. The broadening of credit access across farm sizes also suggests deeper integration of small and medium farmers into institutional finance, though it simultaneously increased exposure to debt-related risks.

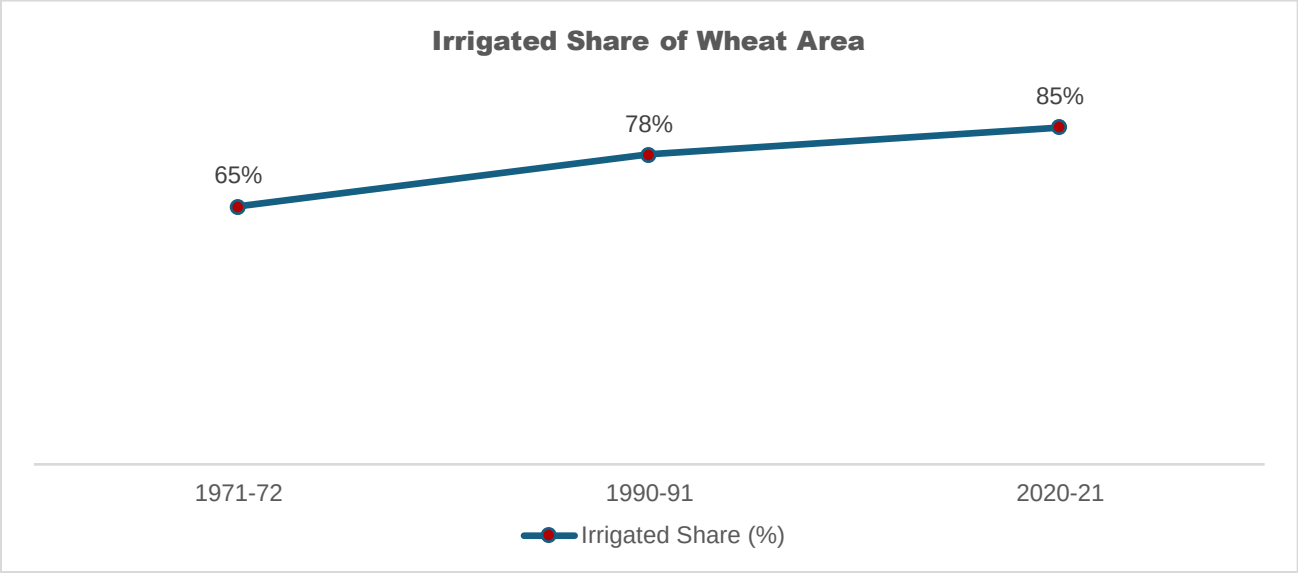



***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

## 8. Crop-Wise Irrigation Highlights Wheat's Centrality

Irrigation data by crop underscore wheat's dominant position in Punjab's agricultural economy. Over time, wheat not only expanded in absolute area but also achieved near-universal irrigation coverage, with more than 85 percent of wheat area irrigated by 2020–21. Sugarcane maintained consistently high irrigation coverage throughout the period, reflecting its water-intensive nature and commercial importance.

Other crops, such as maize and cotton, experienced gradual increases in irrigated area, though with greater variability. These patterns indicate strategic prioritization of staple and high-value crops within Punjab's constrained water environment, reinforcing the province's dependence on irrigation to sustain output growth.




***Source**: Bureau of Statistics, Planning & Development Board, Government of the Punjab — Punjab Development Statistics for 50 Years (1972–2021).*

## About the *Punjab Development Statistics for 50 Years (1972–2021)* Report

This press release is based on Punjab Development Statistics for 50 Years (1972–2021), a comprehensive statistical compendium published by the Bureau of Statistics, Planning & Development Board, Government of the Punjab.

The report consolidates five decades of official data across key sectors including agriculture, banking, industry, health, education, population, infrastructure, trade, energy, and public finance. Drawing from administrative records, censuses, and official statistical systems, it provides long-term time series data to support evidence-based policy analysis and development planning.

By presenting consistent historical indicators from 1972 to 2021, the publication enables trend analysis across sectors and offers a data-driven perspective on Punjab's structural transformation over half a century.

## Editor's Note

This fifty-year review of Punjab's agricultural data tells a story of resilience through intensification. With limited scope for expanding cultivated land, the province relied on irrigation, chemical inputs, mechanization, improved seeds, and institutional credit to sustain output growth. The transformation has been profound — but it has also made agriculture more capital-intensive, input-dependent, and environmentally exposed.

As Punjab looks ahead, the challenge is no longer expansion, but sustainability. Water constraints, soil health pressures, rising input costs, and climate volatility demand a new phase of innovation — one that balances productivity with resource conservation. Understanding how Punjab arrived here is essential to shaping how it moves forward.

**— Aisha Aamir**

***Assistant Manager Research, Gallup Pakistan***

**Wish to Contribute to Gallup Big Data Analysis?**

Gallup Pakistan is looking for collaboration with researchers to expand the Big Data Analysis project. If you have any ideas, please write to Bilal I Gilani, Project Director, Big Data Analysis at Gallup Pakistan.

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