



Reviving Agriculture Growth (Part I)

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The Importance of Agriculture to Pakistan

Agriculture forms the backbone of Pakistan's economy as it provides livelihoods to almost two-thirds of the population and is directly or indirectly responsible for about three-fourths of export earnings. However, Pakistan has not been able to fully exploit the rich potential of its agricultural resources which include a large contiguous irrigated area (43 m acres) and a vast reservoir of underground water. Estimates show that around \$200 billion of output could be generated from these resources compared to the \$70 billion currently generated. Despite such a potential, the country spends its scarce foreign exchange to import about \$10 billion worth of cotton, wheat, sugar, edible oil, milk powder, pulses.

Sector growth rates have been high in some periods but have slackened considerably in recent years. For example, agriculture growth rates averaged 5 percent during 1960-1989 and even touched 6 percent during 2004-06. Since 2007, however, they have only averaged 2 percent and this too only because of the rapid growth of non-crop sectors such as dairy, livestock and poultry. Indeed, in recent years, crop output has barely kept pace with

local consumption needs, leading to reliance on imports in many years.

Slackening agricultural growth exacerbates such challenges as inflation, poverty, employment, income distribution and food security. Inflation typically rises when domestic food production grows slowly. Imports are only a partial solution since rising imports quickly lead to unsustainable current account deficits and depreciation. Poverty is also impacted since food accounts for 40% of the budget of the bottom quintile of the population. Rural poverty is 28.2% while urban poverty is down to 10.9%. Additional cash income from Cotton, Milk and Livestock combined with higher yields and better returns on calibrated sales of staples and storage facilities would push up the incomes of the poor farm households, expand non-farm employment opportunities and lift a lot of them out of the poverty line.

Income distribution in rural areas is highly skewed as Top 1 percent of population own, operate and control 22 percent farm area while 90 percent of farm holders own 45 percent of the total farm area with holdings varying from less than 1 acre to maximum 12.5 acres.

The agriculture sector employs 37% of the total labor force while produces only 20% of national income signifying that there is a lot of disguised Unemployment or underemployment. As the use of modern technology and implements is extended to small farmers there would be a reallocation of surplus labor from farming to rural nonfarm, Argo processing, marketing, input supply, mechanics, and Operators, to urban areas and to the Gulf states.

Pakistan ran a deficit of \$3.6 billion on its food trade in FY22. This was due in part to extraordinary conditions such as floods, rising global commodity prices, and rapid exchange rate depreciation. But it was also due to structural problems in the agriculture sector which affect productivity and accentuate the food security challenge. Had average wheat yields grown at same rate as in the 1965-95 period, agricultural production in 2022 would have reached 40 million tons. This would have stabilized consumer prices and led to higher exports, leading to better food security in the process.

Experience shows that when agricultural growth rates have been high in Pakistan (say, around 5.0 percent), positive changes have been seen in poverty, income distribution and food security. The main challenge faced now is to increase agricultural growth rates. The high growth strategy outlined below can help guide Pakistan's future development in the presence of demographic, urbanization, technology, and climate change risks.

The correct metric for measuring the performance of agriculture sector is not the declining share of the sector in GDP but changes in total productivity from the existing factor endowments i.e., output per acre land, output per laborer employed and output per unit of water. To illustrate this point, in 1950 the agriculture sector accounted for more than 50% of GDP but it produced only 3 tons of wheat that was insufficient to feed the 30

million population at that time. 75 years later the population has multiplied seven-times, but wheat production has risen by nine times while the agriculture sector's share in GDP has declined to around 20%. Is the country better off today when the share is relatively low or was it better off when agriculture accounted for more than half of the national income? The share of agriculture in India is now down to 16 percent of GDP from 60 percent but it produces 323 million tons of foodgrains and exports \$ 50 billion worth of agricultural commodities. Per capita availability of food has risen by 11 percent in the last seven years—all this due to higher productivity in the agriculture sector as the land and water resources did not rise proportionately.

In the United States, the share of agriculture is less than 1 percent of GDP, but it not only feeds 334 million of its population but exports surplus commodities to the rest of the world. The higher the productivity the lower would be the sector's share in GDP as the surplus labor released from agriculture is used for other dynamic sectors of the economy accelerating overall growth.

The Challenge of Boosting Agricultural Productivity and Growth

The challenge of raising agricultural growth is mostly one of raising agricultural productivity. In particular, it involves raising the productivity of small farms operating on less than 12.5 acres of land. Such farms form 88 percent of the number of farms in Pakistan and account for 45 percent of total farm area. The difference in the highest yields achieved by progressive large farmers (owning more than 50 acres) is four times that of small farmers (with less than 12.5 acres). While large farms have continued to show productivity gains in the past two decades, the productivity performance of medium and small farms has deteriorated. As a result, the overall level of productivity growth in agriculture has been declining.

Productivity increase is inevitable for meeting the future challenges of urbanization, demography, and climate change. Agriculture consumes 93 percent of freshwater at present. As urban population rises some of this has to be diverted for drinking purposes at the same time meeting the full needs of agriculture. Similarly, some of the land would be utilized for growing urbanization. Increasing the number of labor force would find jobs in industry and services sectors in urban areas. In other words, the reallocation of labor away from agriculture that is relatively less productive than non-agriculture is the cornerstone of prosperity.

The composition and growth pattern of the agriculture sector has also evolved over time. Crops which were synonymous with agriculture now account for only one third of the total sectoral output while two thirds originate from livestock and dairy and only one third by major crops - wheat, rice, sugarcane, cotton and maize and minor crops, fruits and vegetables, pulses. This change has taken place because Livestock sub sector has been growing at 3.7 percent per year for the last three decades while crop sub sector by 2.3 percent. Increases in crop output have taken place because of greater use of inputs --seeds, fertilizer, and pesticides rather than due to technical or institutional changes. It is the latter called total factor productivity TFP that is indeed the major driver of growth in every sector of the economy. Unfortunately, TFP accounted for 44 percent output growth in the 1960s, 67 Percent in the 1980 and 37 percent in the 1990s.TFP now accounts for less than a fifth of the growth.

TPF growth has been contracting since 1998 with positive gains derived by the large farmers while a significant decline is recorded on the small and medium farms. A modest 10 percent increase in yields of wheat on an average would raise national output to 30 million tons that adequately meets the

domestic consumption. Even such a modest increase would obviate the need for imports, thus saving foreign exchange. After all, large progressive farmers do produce an average of 50 maunds in their land in the same agro-ecological zones.

The strategy proposed consists of six elements (a) Water Management (b) Research and Development (c) Agriculture Financing (d) Import Substitution and Export Expansion (e) Seed Improvement and (f) Mechanization, Technology and Advisory Services. A focus will also be needed on public policy interventions in commodities market which are creating distortions and on the promotion of innovative ideas and practices. The first three elements are discussed in the rest of this paper while the remaining elements will be covered in a second paper to follow.

A) Water Management

Pakistan draws 145-million-acre feet (MAF) from the Indus River Basin Irrigation System and 50 MAF from ground water. 93 percent of surface water is used for agriculture purposes and the rest for urban and industrial purposes. Of the 106 MAF of water that reaches canal heads only 41 MAF reaches crops, due to illegal diversion at heads and losses in water courses and fields. More than 50% of surface water is wasted during distribution and field application before reaching the crop root zone. Underground water is being overdrawn leading to rapid depletion of aquifers. Drought, floods, wastage, and depletion of aquifers are becoming stumbling blocks for agricultural growth.

A national water policy was approved in 2018. It included recommendations in key areas such as: reduction of 33 percent in river flows that are lost in conveyance, augmentation of water storage capacity by 10 MAF, increase of at least 30 percent in the efficiency of water use, expansion of drip and sprinkler irrigation,

implementation of a realistic water pricing policy, replacement and refurbishing of old irrigation infrastructure, real time monitoring of river flow through telemetry to check for unaccounted losses, higher public sector investment allocations to the water sector, and more capacity building of water related public sector organizations. Management of water resources requires the highest level of skill and knowledge and therefore the capacity building of all water related public sector organizations at federal and provincial levels were to be given high priority. Progress in implementation has been slow. The National Water Council, the highest decision making and coordinating body for water, has not met even once since 2018.

Lining of water courses, construction of small reservoirs on the farms, use of solarized tube wells, rainwater harvesting, and adoption of drip and sprinkler irrigation systems are other measures through which impediments for small farmers can be removed. The key constraint, however, remains the political economy of governance and management of irrigation system which has given rise to both inefficiencies and inequities.

The access of the average farmer to water is less than it could be due to limitations of the water allocation system. Access to canal water is determined by physical location along the canal and through the Warabandi water allocation system of administratively set rotations. Upstream farmers often access water illegally and flood their fields leaving insufficient water for those at the tail end of the watercourse. Making water use more efficient and equitable could save an additional 12MAF.

Water charges (known locally as abiana) are too low to cover the costs of repair and maintenance or to discourage wastage. At present, surface water charges are around one fourth of what farmers pay privately for ground water drawn from tube wells. Flat

water pricing or uniform water charges rather than usage based on volumetric measures discourage the adoption of high efficiency irrigation technologies and conservation of water. The abiana is not only low but only 60% of the assessed value is collected. The national average rate for abiana for cotton and for rice are the same though rice requires 60% more water than cotton. Irrigation charges do not reflect the crops' relative profitability. Water charges amounting to 6% of gross income are common in many Asian countries.

In the future, water availability is likely to become more erratic as climate change raises average temperature, Himalayan snowpacks diminish and rainfall variability increases. Pakistan has already witnessed heat waves, abnormal rainfalls, heavy floods. Arid and semi-arid agro-ecological zones such as Tharparkar, Cholistan, Thal, Southern Khyber Pakhtunkhwa, and Baluchistan, already severely affected areas, are likely to suffer even more. Water management is an area where net productivity payoffs to small and medium farmers remains high.

B) Research and Development

Past research focused primarily on modern inputs (seeds, fertilizer, pesticides) and on crops. In the future, research will have to focus much more on issues of sustainability such as integrated crop management, soil health, economical use of inputs and resources and the balancing of external input use with internal nutrient sources. More research is also called for on the prospects for livestock and fisheries. R&D is needed to develop technologies that can build tolerance to stress such as floods, drought, heat, cold temperatures and to strengthen resistance against pests and diseases particularly for small farms.

The current public research system labors under constraints of technical capacity, financing, management, coordination,

duplication, and lack of extension to farms. Budgetary allocations (at 0.1% of GDP) are usually only enough for personnel costs but not for new equipment purchase and pilot studies. These are usually financed through foreign aid. Opportunities for promotion, compensation and advancement are not linked with performance but are based on seniority, i.e., length of service, just like all other bureaucrats.

Investment in private agriculture research has been curtailed severely for a long time. Incentives such as tax credits should be given to private firms that are investing in R&D activities. A number of private sector companies have moved to this area recently, but they need sustained support for scaling up their operations at the farm level, particularly small farmers who are not able to afford their charges. Disseminating improved cultivars, hybrids, transgenics and other products and reducing yield variability and losses to stresses or costs of production are some of the interventions which the private sector R&D companies can successfully implement.

C) Agriculture Financing

State Bank of Pakistan (SBP) data for the first eight months of this fiscal year show that banking institutions have disbursed over Rs 1 trillion as agriculture credit (Target for FY23: Rs 1.8 trillion compared to Rs 33 billion in 1999-2000) to 3 million borrowers. Private commercial banks, microfinance banks and Islamic banks are now the main lenders while ZTBL which used to be a dominant player (72 percent) before 2000 has become marginalized (4 percent). Subsistence and small farmers account for 93 percent of total borrowers. This amount has been rising but still falls short of the demand and the coverage is limited to only one third of the farms. Other initiatives taken by SBP are Crop and Livestock Insurance schemes, Credit Guarantee Scheme for Small and Marginalized farms, PM's Kissan Package 2022. These schemes are still in their preliminary stages

and awareness campaigns have to be stepped up throughout the small farming community.

Contract farming has been successfully used to engage small farmers and increase their farm and labor productivity. Sugarcane, maize, tobacco, and potato crops are some examples of contract farming that assumes an extensive number of arrangements along the value chain linking small scale farmers to some type of market. This ensures stable and predictable earnings stream for farmers and assured quantity of quality supplies for the buyer/ processors. For provision of formal credit value chain contract financing schemes are being offered by banks guaranteed by buyers/processors. The buyer often provides credit inputs and technical advice. Risk allocation between producer and buyer is equitable. The producer has to provide the committed quantities of the commodity to acceptable standards while the buyer has to purchase the commodity at the agreed price. This offtake guarantee enables small farmers to make on-farm investments.

Warehouse receipt financing is another credit mechanism offered by the SBP. It is estimated that post-harvest losses due to lack of proper storage capacity are in the range of 15-18% for grains and around 25-40% for fruits and vegetables. A reduction in these losses would add around 10 percent to the availability of grains and around 20 percent to the volume of exports of fruits and vegetables. Lack of warehousing, storage facilities and cool chain facilities, lack of grading and standardization can be addressed by promoting warehousing receipt financing. These receipts can facilitate financing for inventory or products held in storage. "These receipts provide a secure system whereby stored commodities can serve as collateral, be sold, traded, or used for delivery against financial instruments. A transaction backed by a warehouse receipt allows a financier to shift risk from the borrower to the asset. Since the lender can sell the liquid collateral asset in case of

default, this type of lending lowers risk and reduces the typical cost of commodity transactions. Small farm-holders can therefore get access to bank loans through this mechanism. Since the lending costs for the financier are reduced, the mark-up rate for borrowers can also be reduced. As the banks discount the warehouse receipts and

provide ready cash to small farmers, the latter do not have to resort to desperate borrowing from middlemen (arhthis) who often force purchases at below market prices at harvest. An amount of Rs 1 billion has been disbursed to 377 borrowers and storage capacity has reached 94, 500 tons.

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