

# Lack of Agricultural modernization and population explosion

## Outline:

### 1- Introduction

Thesis statement: Pakistan has good agricultural land but farmers lack the resources needed to switch to modern technology. In order to meet the growing world population, the production of adequate food has become the primary and sustained challenge for agriculture all over the world.

### 2- Correlation between agricultural modernization and population explosion.

### 3- Reasons for lack of agricultural modernization

- a- waste of water
- b- Soil erosion
- c- Population explosion

### 4- How Population explosion impact agricultural sector negatively:

- a- Population explosion leads to higher food insecurity -
- b- Population explosion leads to more greenhouse gases emissions -
- c- Population explosion leads to a large scale environmental degradation -

### 5- How to modernize agriculture in Pakistan

- a- Adapt to climate change
- b- Increase agricultural resilience.
- c- Reallocate public funding
- d- Adapt to urbanization.

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## 6- Role of Government in Pakistan Agriculture

a) To encourage the development of a smoothly functioning market

b) To play an active role in reducing poverty and protecting the environment

c) Govt Government Spending should focus on public goods and market failures.

## 7- Conclusion.

With the rapid development of cities, the urbanization of the world has entered unprecedented progress, 55% of the world's population is urban, and the border population has been growing by about 7.5 billion since the early 1960s (FAO 2010). In Asia and Africa, urban population growth has reached 90%. (UN DESA, 2018). By 2050, 2.5 billion people are expected to live in urban areas. Unprecedented urban development is now taking place all over the world, and urban population accounts for more than half of the global population. Access to ~~open~~ adequate, safe, nutritious and cash regulated properties in urban areas poses specific food security and nutrition challenges. The actual distance between grain producing areas and consumers, the lack of transport options, the fluctuation of grain prices, the concentration of power in global grain trade, the impact of climate and the failure of the safety net of low-income urban residents, especially in time

of crisis, often limit the access to food (FAO, 2019). In order to meet the growing world population, the production of adequate food has become the primary and sustained challenge for agriculture all over the world. The share of agriculture in total production and employment is declining at different rates, and the challenges are different in different regions. The second challenge facing global agriculture is to develop new technologies, policies and institutions that will help to realize the full potential of agriculture as an engine of growth. Although agricultural investment and technological innovation are increasing productivity, it is disconcertingly low that output growth has slowed down. In order to reduce the loss and waste of grain in agricultural output, the goal of increasing production can be achieved. However, the degradation of natural resources, the loss of biodiversity and the spread of plant and animal diseases and pests across the border have hindered the necessary acceleration of productivity growth, and some of them have become resistant to antimicrobial agents. Developing a new set of technologies, incentives and policies to encourage small-scale farmers to attach importance to long term management of natural resources and improving the productivity and profitability

of small scale farmers are closely related to improving the management of natural resources in developing countries (FAO, 2017). Based on indigenous and traditional knowledge, the establishment of agroecology, agroforestry, climate intelligent agriculture and protective agriculture is a process of 'holistic' transformation. To solve the problem of climate change and aggravation of natural disasters affects all ecosystems and all aspects of human life, so it needs to be realized through the progress of new technologies, coupled with the sharp reduction of economic scope and the use of agricultural fossil fuels. It is also necessary to strengthen international exchanges and cooperation to comprehensively prevent emerging cross-border agricultural and food system threats, such as pests and diseases. Strengthen the innovation system based on the conservation of natural resources to improve productivity. However, there is a need to respond to growing demand, climate and soil changes, mainly the risk and pressure of human interference with agricultural production systems.

The agricultural sector is facing various problems even though its contribution to the national income is dominant. There are some of the problems that are the cause of agricultural backwardness

impede economic growth and development of the economy -

Rate of water wastage is very high in Pakistan. Archaic method of flood irrigation is being used due to which 50 to 60 percent water is wasted - New system like drip irrigation has been introduced at different parts of the country which saves not only water from wastage but also provides water to the plants according to their need -

Land is eroded through water and wind. Dry land is eroded by wind gust while barren land is eroded by water - Both of these problems exist in the province of Sindh. Trees and plants keep the land wet. There is acute shortage of forests and greenery in the province - A considerable area of land under cultivation is eroded every year, throwing land out of cultivation - No effective measures have so far been.

In a nation like Pakistan, where the security of one's food supply is critical for those living in poverty, it is imperative to take on the issue of increasing food production. Overpopulation has badly hampered the economic growth in the country. High population is responsible for a decline in the per capita income -

This leads to a decline in the purchasing power of the people. As the demand for goods ~~here~~ decreases then by 'Demand and Supply' law the investment in the country will also suffer. Such a stagnant economy will lead to closing of factories and businesses and in return add to joblessness and poverty. Even if the country somehow is successful in attracting foreign investment, still overpopulation will not allow these investments to have a positive effect on the country's economy - Greater population means more number of hungry souls to feed.

Population growth is rapidly accelerating, intensifying the pressure on food production. This, in turn, leads to higher food insecurity, more greenhouse gases emissions, and large scale environmental degradation. Food production, therefore, needs to adapt to accommodate a growing population and a changing climate.

Population explosion leads to higher food insecurity. According to UN, the world population is currently at 7.7 billion. This is expected to grow to 8.5 billion by 2030, 9.7 billion by 2050, and reach 11.2 billion people by the end of the century. Such a rapid growth is associated with rising demand for resources such as food and water, energy, and space, as well as education.

better sanitation, and better access to healthcare. However, contemporary agriculture is already facing several challenges to keep up with rising demand. From climate change to the degradation of soil health and the rapidly decreasing availability of arable land, the environmental impacts of food production are unsustainable. Current studies also highlight that population growth reduces the quality and quantity of natural resources through overexploitation, intensive farming, and land fragmentation.

Population explosion leads to more greenhouse gas emissions.

Agriculture emits an estimated 18.4% of greenhouse gases, placing it second behind the industrial energy sector (~73.2%) in terms of the highest emitting sectors of human activity. The association between population growth, food production, and  $\text{CO}_2$  emissions was further explored in a 2022 study by Rehman et al. The authors focused on Pakistan, a rapidly growing nation, to develop a regression model linking population growth, food production, and  $\text{CO}_2$  emissions. The error correction model found that better economic growth and energy utilization can lessen greenhouse gas



emissions

Population explosion leads to large scale environmental degradation - Food production and urban and rural population growth directly increase  $\text{CO}_2$  emissions ~~while~~ which leads to environmental degradation - Population growth contributes greatly to  $\text{CO}_2$  emissions, and identifying causal factors, geographic regions, or key factors that emit the most can help address green house gas emissions -

Policies worldwide have focused on limiting environmental impacts while improving agricultural productivity to address the growing impacts of population growth on agriculture. Notably, automated technologies, genetically modified resistance in crops, and the transition away from meat-based products may achieve both objectives without compromising food security to the detriment of biodiversity.

Much of Pakistan is semi-arid, making the country particularly vulnerable to climate-related shocks. The impact of alternative policies and investments in water shortage and distribution, including canal rehabilitation, maintenance, and drainage, to keep water flowing, protect against severe floods, and meeting the country's changing water and

energy needs must be explored

There must be increase in agriculture resilience. If Pakistan wants sustainable, consistent growth, it must fortify its agriculture sector against weather extremes including droughts, floods, heat, and cold, and against pests and diseases. This will require public investment and substantive policy reforms in agricultural research, extension, seed systems, and agricultural input markets to support farmers.

To fund such reforms, the Pakistani government must shift spending from the domestic procurement, storage, and distribution of wheat, which amounted to 24.84 billion PKR, in 2012/13. Savings can also be found by reducing subsidies to the fertilizer industry with that money redirected to research and extension efforts designed to improve soil and fertility management.

The rapid growth of Pakistan's urban areas means that demand for high-value perishable products such as fruits, vegetables, dairy and meat is rising. Maximizing this important opportunity for rural growers, too will require major infrastructure investments including more stable electricity services, reliable transport networks and

other building blocks of modern supply chains  
The proper role of Pakistan's government in the agriculture sector should be to encourage the development of a smoothly functioning market, through institutional and regulatory reform that facilitates market efficiency and private sector activities.

Improving conditions for the rural poor will require major investment and policy reforms at the national and provincial levels, including expanded, well targeted social safety nets; improved health and education service delivery; an expansion of hygiene and sanitation infrastructure in rural areas; and capacity strengthening for public service provision at the provincial and local levels.