DEPARTMENT OF AGRICULTURAL ECONOMICS, EXTENSION EDUCATION & RURAL SOCIOLOGY
COA (CSKHPKV, PALAMPUR)

CREDIT SEMINAR

PRESENTED BY:
PAVITTAR (A-2016-30-033)
M.SC. II Year
DETERMINANTS OF AGRICULTURAL GROWTH AND THEIR MEASUREMENT
The Indian economy has changed structurally over time with the anticipated decline in agriculture’s share in the gross domestic product (GDP).

Despite a fall in its share from 55.1 percent in 1950-1951 to 17.2 percent in 2016-2017, agriculture remains important for two major reasons.

First, the country has achieved self-sufficiency in food production at the macro level but is still a food-deficit country.
• It is challenged massively by the high prevalence of malnourished children and high incidence of rural poverty.
• The pressure on agriculture to produce more and raise farmers’ income is high.
• Second, the dependence of the rural workforce on agriculture for employment has not declined relative to the sector’s contribution to GDP.
• This has resulted in widening income disparity between agriculture and non-agriculture sectors.
The experiences of developed countries show that the transfer of labor force from agriculture to non-agriculture, particularly manufacturing, has promoted production growth in agriculture and thus higher income.

However, India’s manufacturing sector witnessed volatile growth and its share in GDP has almost remained constant at 15 percent in the last three decades.

Under these circumstances, higher agricultural growth is vital. It is a matter of concern for policy planners and research scholars in recent times.
• So, it is useful to analyze the determinants of agricultural growth and decomposing agricultural growth into the contribution of changes in area, yield, and crop composition.

• This form of analysis indicates the impedance of non-price factors underlying the various sources of growth.

• For example, an expansion of area often requires substantial investments in transportation, communications and other forms of social infrastructure to open up new areas and to facilitate specialization and exchange.
• Yield growth is also based largely on public investment in the generation and application of technology.

• Changes in crop composition occur due to shifts to more productive areas and to higher value commodities.

• Change in crop composition is, in part, an embodiment of technological change as lower production costs cause resources to shift to commodities benefiting from the new technologies.
• The productivity growth in agriculture is both a necessary and sufficient condition for the development of the sector as well as the economy.

• The use of modern inputs imposes the marginal productivity of the land, labor and capital. They also induced better utilization of basic inputs (irrigation, HYV seeds, modern agriculture machinery and equipments, fertilizers, etc.,) which gets reflected in increased cropping intensity.
Moreover, it would also capture the effect of proper timing, improved quality of labor, better farm management practices, greater utilization of resources, like land equipment, which leads to increased crop intensity, changes in cropping pattern in favor of high value added crops, etc.

The broader the coverage of resources, generally, the better is the productivity measure. The best measure is one that compares output with the combined use of all resources”. 
Agricultural growth in history

- In the early 1950s, half of India’s GDP came from the agricultural sector. By 1995, that contribution was halved to about 25 per cent. The significant contribution of agriculture sector to the GDP of the country in the initial period of planning period reflects the inadequate development of non-agriculture sector.

- Although, agriculture still contributes significantly to the growth in GDP of the country but has remained the slowest moving sector of Indian economy.

- During the pre-green revolution period, i.e. from independence to 1964-1965, the agricultural sector grew at an annual average of 2.7 per cent. This period saw a major policy thrust towards land reforms and the development of irrigation infrastructure.
In the post green revolution period from the mid-1960s to 1991, the agricultural sector grew at an average of 3.0 percent with 3.5 percent during 1980-1981 to 1990-1991. The green revolution period involved the adoption of modern technology and HYVs to the agriculture sector.

The agricultural sector’s growth decreased to 2.9 percent during 1992-93 which was further reduced to 2.5 percent during 1997-1998 to 2006-07.

The important reasons for the slowdown are: no major breakthrough in developing new high-yielding varieties during the 1990s, reduction in the public expenditure in agriculture sector and a decline in the environmental quality of land which reduced the marginal productivity of the modern inputs.
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Pre-green revolution period (PGR)
Early green revolution period (EGR)
Period of wider technology dissemination (WTD)
Period of diversification (DIV)
Post-reform period (PR)
Period of recovery (REC)
Objectives

- To explain the determinants of agricultural growth,

- To describe the different methods of measurements of agricultural growth.
Methodology
COLLECTION OF DATA

- The secondary data was used for accomplishing the objectives of the study which has been collected from various sources such as reports, journals, websites etc.
Determinants of agricultural growth
Determinants which influence agricultural growth:

| Institutional factors | • Agricultural credit  
|                       | • Land holdings       |
| Infrastructural factors | • Irrigated area       
|                        | • Farm mechanization   
|                        | • Electricity          
|                        | • Storage infrastructure |
|                        | • Transportation       
|                        | • Agriculture market   |
| Technological factors  | • HYVs/seed            
|                        | • Fertilizers          
|                        | • Pesticides           |
| Socio-economic factors | • Population           
|                        | • Poverty              
|                        | • Literacy             |
(a) Institutional factors

- Land Holdings
- Agricultural Credit
The average size of land holding has been continuously decreasing on account of increasing number of land holders. From an average of 2.28 hectares in 1970-71, it went down to 1.15 hectares in 2010-11.
In India, more than 82 per cent of the farmers belong to the small and marginal farmers category and these farmers have less than 2 hectares of land (GOI, 2011).

"Such tiny holdings by large majority of the farmers are neither viable nor sustainable for a country with billion plus mouths to feed and the continuous decline in the average size of land holdings also creates a serious problem (Kumar, 2010)."
• In addition to this, fragmentation of land holdings, lack of off-farm occupations and inheritance laws of an equal division of property among heirs, lead to the division of land into small blocks.

• However, these small and marginal farmers have the poor economic base. Consequently it has an adverse effect on the growth of agriculture sector.

• Thus, this high fragmentation of land restricted and hindered dissemination of modern technology in the agriculture.
Agricultural Credit

- Credit is the backbone for each sector of the economy. Credit is one of the vital prerequisite of the farmers, which facilitate them to meet the investment as well working capital requirements.

- Like other sectors, availability of credit for the agriculture sector must be easy, adequate, and timely. Despite of a large network of Rural Financial Institutions (RFIs), a large portion of the rural population is continuously neglected by the formal banking sector in India.

- In India due to long gestation period, lack of trained technical staff to identify the potential activity in this field, poor eligibility and security problems are some of the reasons behind insufficient credit flow to agriculture sector.
Types of agriculture credit in India

- **Short term credit** (for a period of less than 15 months to purchase seeds, fertilizers and wages etc)
- **Medium term credit** (for 15 months to 5 years to purchase machinery and scientific policy)
- **Long term credit** (for more than 5 years for change in cropping pattern)
Sources of agricultural credit

Institutional credit
- Co-operative
- Commercial
- RRBs

Private credit
- Money lenders
- Landlords
- Traders Commission agent
Gap between Demand and Supply of credit

Agricultural financing in India

- Nearly half of the farmers have no access to credit
- 27% have access to formal sources
- Those have no access; 88% are marginal farmers

Agricultural credit in India, Rs billion

<table>
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<th>Year</th>
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<th>Demand</th>
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<tr>
<td>2007-08</td>
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<td>7741</td>
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Infrastructural Determinants

Infrastructure is the cornerstone for any growth performance in agriculture sector.

Infrastructural facilities relate to various types of farm implements and machinery and other structures like tractors, pump sets, cold storage facilities, adequate supply of power, good rural-urban road network, efficient transportation, developed agricultural marketing and other technological advancement.

The availability of these inputs and their skillful utilization maximize the benefits of the farmers which in turn has a positive impact on the growth of agriculture sector. However, the presence of these facilities is highly inadequate in the country and there is large inter-state disparity in their use which has led to dismal agriculture performance in India.
Types of Infrastructural Determinants

- Irrigated Area
- Farm Mechanization
- Electricity
- Storage Infrastructure
- Transportation
- Agriculture Marketing
Irrigated Area

- According to Agricultural Census 2010-11, India’s total area under irrigation is 64.7 million hectares. Of this maximum 45% is shared by tube wells followed by Canals and wells.

- In India government play important role in development of irrigation sources like development of canals, construction of water storage structures etc.

- Many watershed management projects started from since 1980s. These projects are based on rainfall and runoff harvesting schemes that involve rehabilitating, building small check dams and tanks, and groundwater recharge structures.
Importance of increase the area under irrigation

- It is necessary to reduce the dependency on rainfall and stabilize the cropping pattern.
- Irrigation also allows farmers to grow more crops in one year on the same land.
- The constant availability of water for irrigation provides a sense of stability to the farmer, and also encourages him to practice newer farming methods and patterns to maximize the productivity.
- Bringing more land under cultivation.
- Higher productivity and growth on irrigated land.
- Reduces instability in output levels
Farm mechanization means the use of machines and technology in the agriculture sector. The use of tractor, tube-wells and plant protection measures are included in the farm mechanization. So in the farm mechanization the use of machinery is greater as compared to the labor.

Increasing the power supply to agriculture means that more tasks can be completed at the right time and greater areas can be farmed to produce greater quantities of crops while conserving natural resources.
Farm implements played active role in success of green revolution often forget mechanization

Mechanization enhances labor productivity and reduce human drudgery and also help in increases in cropping intensity.

Farm power usually increase productivity, and mechanization deals with more and more farm power. Government is encouraging this by providing credits and subsidies to farm machinery in India
Use of farm implements for larger and medium farmers is very useful because they save time, reduce labor employers, increase in work efficiency and relief for farmers.

On other hand for small and marginal farmers use of implements is costly. So small holding farmers think properly before buy the implements because cost of production is increase on small area.
Electricity

- Considering the importance of irrigation and its impact on growth and development of agriculture and allied activities, attention needs to be focused on the development of power sector in the country.

- Thus, water pumps are the greatest breakthrough in improving the irrigation crisis in India as about 1/5th of the total electricity production of the country is utilized in pumping groundwater for agriculture.

- Hence, electricity has played a major role towards maintaining food security in India by increasing the rate of agricultural production.
Lack of proper infrastructure like, post-harvest handling, transportation, storage and cold storage facilities, destroy about 25 and 40 per cent of our horticultural commodities, like fruits and vegetables which leads to price volatility of these crops particularly potato and onion.

agricultural produce are basically perishable in nature and lack of rural infrastructure like power, roads and transportations, marketing infrastructure and inadequate processing and post-harvest technologies force the farmers to sell their produce below the cost of its production.

Therefore, the development of cold storage along with road and marketing facilities are precondition to the proper growth of agriculture in the state.
Importance of storage infrastructure

- Scientific storage of produce from the vagaries of weather, rodents, insects and pests. They prevent quality and quantity losses.
- Regulating price levels by regulating the supply of goods in the markets. More goods from the buffer are released when supplies are less and less is released when supplies are more in the markets.
- Offering market intelligence in the form of price, supply and demand information so that market users may develop selling and buying strategies.
The development of any region is quite impossible without the provision of good physical infrastructure. Therefore it is appropriately said that infrastructure is the backbone and basic requisite for the economic development of a region.

In this regard; proper connectivity and transport links are considered to be most critical for delivery of services, transaction of commerce, and connection with growth centers around the country.

Rural infrastructure like road connectivity and transport facilities is one of the most crucial mechanism, which has a close link with the reduced transportation cost and market expansion, and thus overall improved agricultural productivity and competitiveness in the economy.
Agriculture Marketing

- Marketing is the key instrument in the development of the agriculture sector. Agriculture marketing includes the movement of agricultural produce from farms where it is produced to the consumers or manufacturers.
- It also includes the marketing of production inputs like fertilizers, pesticides and other agricultural chemicals, livestock feed, farm machinery, tools and equipment and services to the farmers.
- The basic feature of agricultural efficient marketing system is not only to provide the opportunities to purchase the consumer goods but also to provide incentives to the farmers to produce more.
• It should also encourage true competition among the traders and abolish the exploitation of farmers’ particularly small and marginal farmers.

• The absence of rural road connectivity and other infrastructure, combined with improper management, lack of market intelligence has resulted in a system that is unfavorable to the farmers.

• The adverse impact of all these is more pronounced in the case of small and marginal farmers who constitute about 82 per cent of the entire farming community.
- The marketing infrastructure deserves special attention in case of horticultural crops like fruits and vegetables.
- Because due to perishable nature of horticulture produce, farmers sell their produce immediately after harvest which until reaches the final consumers passes through the various types of intermediaries.
- This large chain of intermediaries results into high marketing costs which in turn makes the profit margins of small farm growers thin.
Technological Determinants

- HYV Seeds
- Fertilizers
- Pesticides/Chemicals
HYV Seeds

Under the new agricultural approach special concentration has been made on the development and adoption of high-yielding varieties of seeds.

Importance of HYV seeds:-
1. Genetically enhanced seeds
2. To increases growth speed
3. Resistant to disease

In the Indian conditions it has been seen that approximately 45.0% increase in the crop production is associated to the increase in yield which is in turn is a direct function of the application of HYV seeds.
Fertilizers/Pesticides

- Fertilizers are given extra importance, as they are the ones that help plants in the initial stages of growth. Fertilizers are materials of synthetic or natural origin which are applied to the plant tissues or soil for supplying plant nutrients crucial to plant growth.
- Although fertilizers applications may be necessary to bring new lands under cultivation, its major influence acts through the yield-increasing component.
- Pesticides are the mixture of substances which helps in preventing, destroying or controlling the pests of unwanted species on plants.
• Crop losses in the country due to various pests range from 10 to 30 percent each year depending upon the severity of pest attack.

• Pesticides play an important role in sustaining agricultural production of the country by protecting crops from pest attacks and by keeping the pest population under control.

• Availability of safe and efficacious pesticides and their judicious use by the farming community is critical to a sustained increase in agricultural production and productivity.
Socio-Economic Determinants

- Population
- Literacy Rate
- Poverty
Population

- The majority of people in India live in rural areas, which are experiencing rapid population growth and declining per capita farm sizes.
- Therefore, the influence of population growth on agriculture will have a large impact on the ability of smallholder farmers to feed themselves, their families and urban population.
- Demand is directly proportional to population, more is demand more is need of agricultural (supplies food, fiber, medicines, spices, etc). More need of agriculture produce leads to growth of agriculture market and farms.
Literacy rate

- Education creates awareness among the people to take advantage from the changing market situations and plays an important role in the socio-economic development of a country.
- It changes people’s attitude to accept new and modern technologies without which development is impossible in modern era.
In the agrarian society, education plays a key role in accepting new practices of farming like use of inputs (fertilizers, HYV seeds, uses of insecticides and pesticides) technologies and machinery. This increase production and productivities of crops.

Literacy level change people’s life style and their daily needs. People are giving more focus on quality and nutritious food (eg. organic) rather than traditional food. They are shifting to modern foods (pasta pizza, oatmeal, etc) and end up changing agricultural demand and production.
Poverty

- Due to low purchasing power of the farmers, they are unable to purchase adequate and appropriate amount of agricultural inputs at the time of cultivation. Which causes low productivity of food grains.
- People are unable to meet their minimum basic needs because of the poverty. Which adversely affect their consumption pattern and the standard of living.
- When purchasing power of people is high they spend more on food, clothing and other daily needs. This finally affects agriculture production and sale of agricultural products.
The effect of various identified inputs and other factors to in the level of agricultural output has been estimated on the basis of following Cobb – Douglas production function. The algebraic form of the function used in the analysis is as follows:

\[ Y = a \left( x_1^{b_1} x_2^{b_2} x_3^{b_3} x_4^{b_4} x_5^{b_5} x_6^{b_6} x_7^{b_7}\right) + \mu \]
Where, \( Y = \text{GDP Agricultural} \)
- \( x_1 = \text{Long term total institutional credit to agriculture (Rs.)} \)
- \( x_2 = \text{Irrigation} \)
- \( x_3 = \text{Electricity consumption in Agriculture (in K.W.H.)} \)
- \( x_4 = \text{Length of roads maintained by PWD (in kilometer)} \)
- \( x_5 = \text{Public Investment in agriculture (Rs.)} \)
- \( x_6 = \text{Fertilizer (N+P+K) consumption (kg per hectare)} \)
- \( x_7 = \text{Consumption of Pesticides (M.T.)} \)
- \( \mu = \text{Error term} \)
- $x_5 =$ Public Investment in agriculture (Rs.)
- $x_6 =$ Fertilizer (N+P+K) consumption (kg per hectare)
- $x_7 =$ consumption of Pesticides (M.T.)
Conclusion

- There are various institutional, infrastructural, technological and socio-economic factors that directly or indirectly affect the agricultural development in Country.

- The size of land holdings and the institutional credit are the main institutional factors whereas the net sown area, irrigation, transportation, electric power and storage capacity are the main infrastructural factors that influence the pace of agricultural growth.

- The important technological factors are the high quality seeds, fertilizers and pesticides which are instrumental in improving the status of agriculture sector in the country. The literacy rate, population growth and poverty ratio in the country are the main socio-economic factors which needs attention for the sake of fast growth rate in the agriculture sector.
In order to increase agriculture growth the integration of various policies is demand of the hour.

There is telling need of correlation of agriculture development institutes and farmers.

More focus is needed on Agriculture development projects, Public Private Partnership, Agricultural Marketing Information Network, and other various factors that influence the agricultural growth.
THANK YOU