EDUPHORE IAS
WEEKLY CURRENT AFFAIRS

Topic of the week: "CAPITAL FORMATION IN AGRICULTURE"

Agriculture a crucial sector for the Indian economy:

- Primary source of employment for the rural masses, growth has important **implications for poverty reduction in the rural areas.**
- It is at the **core of socio-economic development of the country.**
- It accounts for around 13% of GDP and about two-third of the population is dependent on the sector.
- Although its contribution to the overall Gross Domestic Product (GDP) has come down from 30% in the early 1990s to less than 13% in 2014-15, however, **its employment share still has been recorded around 45.7% during the same year.**
- **Growth of other sectors and overall economy hinges on the performance of agriculture through its backward and forward linkages**.
- It is not only a **source of livelihood and food security for a large population** of India but also has a special significance for low income, poor and vulnerable sections.

> The experience from BRICS countries indicates that a **one percentage growth in agriculture is at least two to three times more effective in reducing poverty** than the same growth emanating from non-agriculture sectors

Capital formation in Agriculture

- Investment means acquiring a physical assets that result in creation of a stream of incremental income over a period of time.
- Capital formation through investment in agriculture helps in improving the stock of equipment, tools and productivity of natural resources which enables farmers to use their resources (land, Labour etc.) more productively.
- Creation of capital goods is thus necessary for raising productivity and realising long term growth potential.
- Investment grossly defined as capital formation is one of the basic requirement for the growth of any sector.

> The term capital connotes those 'assets' which are used as inputs in the process of production to generate further goods and services.
>
> - Tangible capital in agriculture refers to productive physical assets like tractor, irrigation pump- sets, farmhouse buildings, warehouses etc.
> - Intangible capital in agriculture refers to investment made in health, education and training of farm workers.

Trends in Capital Formation in Agriculture

- **Gross Capital Formation (GCF) in agriculture as a percentage of agriculture GDP is the true measure of growing capital formation in comparison to growth of output in agriculture sector**.

Ratio of Agri-GCF to Agri-GDP	
1950s	**5.1**
1960s	**6.4**
1970s	**9**
1980s	**8**
1990s	**6.5**
2000-2006	**7.9**
2002-07	**13.9**
2007-12	**18.5**

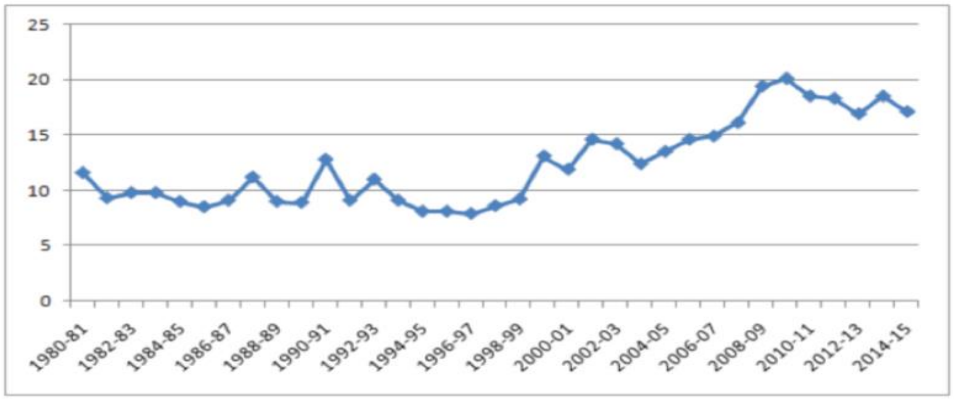

Figure 2.1: Gross Capital Formation Agriculture as a (%) of GDP Agriculture
Note: Figures up to 2010-11 are at 2004-05 prices and 2011-12 onwards at 2011-12 prices
Source: CSO.

GCF in agriculture and allied sector as a percentage of agri-GDP averaged around 7% during the early 1950s that augmented to around 10% in the mid 1970s after which it followed a declining trend until the end of 1990s when it came down to around 8%.

1980s

- The declining trend in the public sector GCFA since early 1980s is attributed to several factors:
    - Neglect of agriculture
    - Rising subsidies and
    - Drying up of resources with the government
    - Growing opposition to big dams and so on

- A dramatic fall in the world rice price during 1980s upset the economics of major rice dominated irrigation systems.
- This perhaps dissuaded the international funding agencies to lend for major irrigation schemes to this reduced funding, as also to the building up of food grain stocks (30 mt in 1986), domestic investment in public irrigation (or public GCFA) also seems to have gone down.
- Apart from these factors, growing opposition to big dams from environmental groups gave a final blow to investments in major irrigation during this time.
- Ashok Gulati concludes that **if India had not neglected the public sector GCFA during 1980s and early 1990s, the growth in GDPA during 1990s would have been above 4% pa**. And this could have placed India comfortably on an overall growth path of more than 7% pa.

1990s

- During this period (end of 1990s) not only public investment declined it set a waning path for the private investment as well.
- **Reversal in trend:** A reversal in the declining trend was achieved from early 2000s through the efforts of government schemes and programmes resulting in higher GCF contributed by both public as well as private investment.
- **10th and 11th Plan**: The percentage of GCF increased to 13.9% of agri-GDP during the 10th Plan (2002-07). It further increased to 18.5% of agri-GDP during the Eleventh Plan (2007-12).
- There has been some decline in GCF in the initial years of Twelfth Plan. Thus, as a percentage of agri-GDP, the GCF in agriculture has more than doubled during the last decade.
- Consequence of increase in agriculture investment: Revival of agriculture growth from less than 3% in the 9th and 10th Plan to above 4% growth during the 11th Plan. However, recent decline is once again a cause of concern as it might slow down the growth process of agriculture sector.

Why the slow down in the 90's?

- The policy approach to agriculture, particularly in the 1990s, has been more **to secure increased production through subsidies in inputs such as power, water and fertilizer, rather than through building new capital assets in irrigation and power.**
- This has **reduced the pace and pattern of technological change** in agriculture and effected TFP (total factor productivity) adversely. The equity, efficiency, and sustainability of the current approach thus becomes debatable.
- The **subsidies also do not improve income distribution and the demand for labour**.
- The boost in output from subsidy-stimulated use of fertilizers, pesticides and water may partly be coming at the expense of deterioration in the aquifers and soil – an environmentally unsustainable approach that may partly explain the rising costs and slowing growth and productivity in agriculture, notably in Punjab and Haryana. Moreover, the deteriorating state finances have meant that **subsidies have, in effect :-**
    - **crowded-out public agricultural investment in irrigation and roads** and expenditure on technological upgrading,
    - limited maintenance of canals and roads, and
    - contributed to the low quality of rural power.
- These problems are particularly severe in the poorer states. Although private investment in agriculture has grown, this is hardly a substitute for lower public investment and deteriorating quality of public services, in some cases involving macroeconomic inefficiencies (such as private investment in diesel generating sets).
- At the same time, power capacity is under-utilised because of poor distribution and maintenance, and excessive use of capital on the farms encouraged by subsidies.
- The fiscal problems of the central and state governments suggest that the subsidies cannot continue to grow, and the stock of rural productive assets and technological basis for growth will be limited by the past pattern of spending, unless low cost options are pursued, which have a higher capital-output ratio.

Capital formation and agriculture growth

- A direct relationship between capital formation and growth has been established with various studies.
- **However, while the GCF as a percentage of agri-GDP has improved substantially, there has not been a commensurate improvement in the rate of growth of the agriculture sector.**
- Following reason is attributed to this inverse trend:
    - **Expenditure on subsidies crowds out public investment in agriculture research, irrigation, rural roads and power.**
    - According to Chand and Kumar (2004), the investment option is much better than subsidies for sustaining long-term growth in agricultural production and also to reduce poverty faster.
    - **The fertilizer subsidy has clearly distorted its consumption pattern,** as there are clear indications that it has led to an imbalanced use of N, P and K in states like Punjab and Haryana and has also contributed to deteriorating soil conditions.
    - **Lower public investment due to more emphasis on provision of subsidy will only further deteriorate the quality of public services** like uninterrupted power supply, in some cases involving macroeconomic inefficiencies such as private investment in diesel generating sets.
    - This leads to under-utilization of power capacity due to poor distribution and maintenance.

Public Capital Formation

- The conventional definition of public GCFA as given in the SNA on **major, medium and minor irrigation schemes and plantations in the forestry sector**
- Ashok Gulati also includes a part of investment in power sector that goes to agriculture and investments made in the 'agriculture and allied activities' as defined in the budgetary heads of the government accounts.
- Ashok Gulati also argues that investments in manufacturing and other industries use with agriculture for supply of agricultural inputs, processing, warehousing, rural development programmes, MP local area development schemes, transport (roads) and railways etc. should also be included while calculating public investment in agriculture. But enough information is not available to segregate.
- Investment by the public sector in fishery negligible.
- When one talks of **declining public sector investment in agriculture** and its likely consequences on agricultural growth, one is basically **referring to the decline in investments in irrigation and that too mainly in major and medium irrigation schemes.** This is because investments in minor irrigation come largely through the private household sector, and there are no signs of its deceleration.

Role of Public Capital formation

1. **Inducement effect** on private investment.
    - There have been many empirical studies favoring the positive and promotional impact of public investment on its private counterpart.
    - The studies of Krishnamurthy (1985) and Chakarvarty (1987) estimated this elasticity to be 0.60 and 0.62 respectively.
2. **Creation of public goods**
3. **Equity**: While the public capital formation in agriculture goes toward large and medium irrigation, private capital is invested on well irrigation. Of these two the former is community based and equitably distributed than the private capital which is mainly individual based.
4. **Regional balance**: Similarly, private capital flows as they are guided by profit maximisation, tend to concentrate in better endowed regions leading to regional inequalities.
    - Agriculturally more developed states like A.P. and T.N. have shown an increase in private capital formation along with the public capital formation.
    - On the other hand, there is no such correspondence in the case of agriculturally backward states like Rajasthan and Kerala. This indicates that private investment is not coming forward even to the extent of inducement effect, let alone substituting the public investment.
5. Important areas like **forestry** are totally left out by private sector
6. **Environmentally unfriendly investments in the private domain** such as increasing investments in ground water exploitation with least concern for its development and investments in fisheries, disturbs the ecological balance but also aggravate inequity.
7. **Core investment**: Role of private sector is rather limited in case of core investments such as infrastructure development eg roads, electrification, communication, cold storage facilities, etc. All these are interlinked. Private investment only follows or induced by the availability of the road.
8. **No substitute to public investment**: While corporate sector can play a vital role in creating the core infrastructure, the entry of corporate sector into agriculture in such a big way is not feasible in the present socio-economic context.
    - Public capital formation leads to increased social welfare while private capital formation leads to individual welfare. As long as we have economic dualism in the society they cannot be substitutes.
9. Unless agriculture sector receives a major boost in terms of productive investments such as irrigation and infrastructure development, it would be highly unlikely to achieve the targeted growth rates in the long run. No such massive investments can be expected from the private sector.

Indian agriculture still continues to be small farmer dominant. As long as enough alternative sources of income (employment) are not available, this large majority of people will tend to join the ranks of unemployed and under-employed. And liberalization does not seem to result in creation of such massive employment in the near future.

- The small farmers not in a position to make productive investments in agriculture. This is more so in arid and semi-arid regions for example Rajasthan .
- The only way to protect them is through productive public investment. Irrigation should continue to be the major thrust area of public investment.

Indian agri small farmers dominated not ready for such a takeover. Even if free entry is allowed to corporate sector, its entry will be limited to potential areas leaving the less endowed regions to their own fate. This has happened even in western agriculture where the subsistence agriculture terrains are protected (subsidised) by the state as it is not lucrative for the corporate sector. Therefore, the role of corporate sector in Indian agriculture in promoting capital formation in agriculture is rather limited in the present context. It cannot substitute public capital formation, especially in terms of its impacts.

Share of various sources in gross fixed capital formation in agriculture and total Economy, 2016-17

Sector	*Capital Investment Rs. crore*	*Capital investment as % of GVA*	*Share in total Gross Capital Formation in Sector %*		
			Private Corporate	*Public Sector*	*Households*
Agriculture	331561	13.3	2.4	19.4	78.2
Non- Agri	4020937	35.4	46.4	25.5	28.0
Economy	4352498	31.4	43.1	25.1	31.8

Source: National Accounts Statistics 2018.

Private(Household) investment in Agriculture

- Private sector investment in agriculture comprises investments in the **household sector and corporate sector – both organised and unorganised.**
- **Organised segment** contains big firms primarily in the plantation sector, and their estimates of capital formation are available in their accounting books.

- The **unorganised sector** are basically private cooperatives like sugar, milk, poultry, etc, and other very small and cottage agricultural enterprises (like dairy, agricultural implements, etc) (and not industries). Information on their contribution to capital formation in agriculture is diverse and diffused. They lack systematic information.
- Within the private sector, the overwhelming share is that of the household sector, which may partially include the share of unorganised corporate sector and private cooperatives as well.
- Households fixed capital formation in agriculture is categorized into following eight components:
    i. Land reclamation
    ii. Building and other land improvements
    iii. Orchards and plantations
    iv. Wells
    v. Other irrigation sources
    vi. Agricultural implements, machinery and transport equipment etc,
    vii. Farm houses, barns and animal sheds
    viii. Other capital expenditure
- **Agricultural implements, machinery and transport equipment constitutes the most important item of fixed capital formation in agriculture**

Public-Private share in CF

- While public investment in agriculture is critical and important, in actual terms, it forms less than 15% of the total investment in agriculture while more than 85% comes from the private sector.
- In the early 1980s, the share of the public sector and private sector (including household sector) in gross capital formation in agriculture was roughly equal, but by the early 2000s, the share of the private sector was four times larger than the share of the public sector.
- Moreover, the private sector responds much better and faster to the incentive structures in agriculture. Hence, along with bringing in greater public investment in agriculture, there is a need for bringing in reforms in the incentive structure as well.
- Apart from public GCFA, **private sector GCFA is considered to be influenced by the availability of institutional credit as well as the terms of trade between agricultural and the non-agricultural sector**

Factors influencing Capital formation in Indian agriculture

1. **Budgetary allocation**
2. **Marginal efficiency of capital**: It is not merely the size of GFCFA but its efficient use that may be taken into account while discussing the growth in GFCFA. It is quite likely that the same amount of capital with improved efficiency may lead to higher GDP.
    - Despite a decline in real capital formation in absolute terms, efficiency in its use has improved in the eighties relative to the period of 1970's.
    - Efficient use of capital in agriculture is encouraged by policy measures particularly in the state of Rajasthan which is marked by a negative growth in capital formation.
3. **Technology and TOT**: Favorable terms of trade for agriculture would mean a price rise for agricultural commodities, increased profitability and a high propensity of farmers for investment and adoption of new technology may be enhanced. There is, therefore, an inter-relationship between favorable terms of trade and technology adoption by farmers.
4. **Institutional Credit and Role of Credit Institutions**: As two-thirds of capital formation in the private sector is through bank credit, the role of banks is important in meeting the private sector's long-term investment credit demand.
    - However, the current estimates suggest that long-term credit is not just declining but also it constitutes less than a quarter of total agricultural credit. The policy thrust, therefore, has to be on incentivizing banks through adequate budgetary support. Similarly, reviving public sector investment is critical due to its multiplier effect on the overall GCF in the sector.

- Thus, there is a need to formulate a long-term perspective plan for rural infrastructure that focuses on infrastructural projects that have the highest total impact and strongest linkages. The convergence of resources of centre and state governments is also important, as it would avoid duplication or concentration of activities in particular areas.

Research & Development

- Efficiency is driven by strong and vibrant R&D by public or private sector.
- **Public sector R&D** in the country is showing a fatigue and suffering from **resource constraint, disciplinary fragmentations, and lack of drive and inspiration.**
- **Private sector investment in agri R&D is also low due to nature of IPR regime in the country**.
- This is resulting in a rising gap between domestic and global agricultural innovations.
- There is a need to facilitate easy access to our farmers to global technology, high quality seed and germ-plasm and other knowledge products.

Biotechnology

- Application of biotechnology in agriculture through genetic breakthrough and genetic enhancement, is playing an important role in shaping future of agriculture.
- The countries which have embraced genetically modified and genetically engineered technology are gaining advantage in terms of productivity and cost.
- **Trends in productivity of soybean and maize in India and the countries which have adopted biotech crops present a stark example of competitive advantage gained by the latter over India through agri biotechnology.**
- **India will face very tough competition from biotech crops, which are leading to higher yield and lower average cost, if the country does not upgrade technology in such crops.**
- Investments to GDP ratio in agriculture at 13.3% is very low. The composition of total investments in agriculture show that 78.2% of it is from households while public investments constitutes 19.4% share.
- Private corporate sector accounts for less than 2.5% of investments in agriculture sector.
- Regulatory restrictions on marketing and absence of business friendly environment in agriculture acts as a deterrent for corporate investments in agriculture production and marketing. This is said to be an important reason for slow change in agriculture, dominance of traditional marketing channels and weak linkage between pre and post-harvest agriculture. Another disquiet feature of investments in agriculture sector is that between public investments show a decline of 0.4% during 2011-12 and 2016-17.
- **Changes in APMC Act and provisions for Contract farming are expected to attract much needed modern private sector investments into agricultural marketing as well as agricultural production. This will also reduce the need for government intervention and support for agriculture.**

Capital Formation in Agriculture & Capital Formation for Agriculture

- Capital formation needs to be seen from two separate viewpoints, i.e., point of capital formation in agriculture and point of capital formation for agriculture.
- The estimates for capital formation as compiled by the CSO include only the capital formation in the agriculture sector by the public and private sectors.
- However, in order to have a comprehensive measure of capital formation in the sector, there is a need for a broader data series that includes capital formation in activities such as production of fertilizers and pesticides, development of agricultural markets, rural roads and communications, agricultural education, research and development of agricultural technology, rural electrification, etc., which form part of capital formation for agriculture as opposed to capital formation in agriculture.
- Policies will need to take into account the complementarities between capital formation in agriculture and for agriculture to provide proper direction to investment in the sector.