The 19th C.D. Deshmukh Memorial Lecture
Delivered by Dr P. K. Mishra,
Principal Secretary to Prime Minister

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"Transforming Smallholder Agriculture in India in the 21st Century: Challenges and Strategies"

Shri Shaktikanta Das, Governor, Reserve Bank of India; RBI family and distinguished guests,

It is an honour for me to be invited to deliver the 19th C.D. Deshmukh Memorial Lecture organized by the Reserve Bank of India.

Preliminaries

It is difficult to encapsulate the crucial role C.D. Deshmukh played in shaping our **financial system**, **governance structure** and **institutional development**.

Commencing his career in the Indian Civil Service (ICS) – he was a member of the ICS for 21 years – he was associated with the Reserve Bank of India for a decade. He was Governor of RBI at the time of India's independence.

He presided over the transformation of the Reserve Bank of India from a private shareholders' bank to a public institution. He was associated with several **institutional initiatives**: long-term credit to industry, provision of rural credit, a mechanism to provide agricultural credit, and so on.

He also played an important role in the Bretton Woods Conference in 1944, which led to the establishment of the international financial institutions.

C.D. Deshmukh had a role in the formation of the Planning Commission, and served as its Member when it was set up in 1950.

He was also associated with research institutions such as the Institute of Economic Growth, and the Indian Statistical Institute. He was **India's Finance Minister** during 1951-57.

It is appropriate that the Reserve Bank of India organizes a prestigious memorial lecture in the name of C.D. Deshmukh who has played a **foundational role in shaping India's financial**, **economic**, and **educational institutions**.

The focus of my lecture today is on **smallholder agriculture**. It may appear somewhat **incongruous**, because at the Reserve Bank of India it is more common to talk about **growth, inflation, monetary policy**, bank credit and other macro-economic aspects.

The title of smallholder agriculture – and not even agriculture sector as a whole – may sound strange. But, it is an aspect that is fundamental to our strategy for economic growth and equity.

A Rationale

I would like to argue that the issue of smallholder agriculture needs to be addressed in order to realise our goal of a **Viksit Bharat** or a developed India by 2047. This is based on the following observations/assumptions:

First, for being a developed country, we need to have not only a higher rate of economic growth, but a growth that is **inclusive**, **equitable** and **sustainable**.

Second, even though India and several other countries have had **higher rates of economic growth** in recent years, the agriculture sector has a relatively lower rate of growth. Hence, the overall growth has n**ot been equitable**.

Third, in several Asian countries, with economic growth there is increase in agricultural GDP in **absolute terms**. But, the **share of agricultural GDP** in the total GDP has sharply declined. Further, the percentage of workers in agriculture in the total workforce has **not commensurately declined**. This has implications not only for equitable per capita income among workers in agriculture and non-agriculture sectors, but also the **employment situation**.

Fourth, agricultural growth has an important role to play in **reducing poverty**, particularly in rural areas.

Fifth, another aspect is the age-old debate on **inverse relationship between farm size** and **productivity**. Several studies find that small farmers are **more efficient** than large farmers in terms of **productivity**. This finding questions the notion of economy of scale in certain situations.

It is for these reasons that we need to address issues of smallholder agriculture.

Trends of Agricultural Growth and number of Small Holders

India's agriculture sector has grown during the last five decades witnessing substantial transformation. The **Green Revolution** of the 1960s, **agricultural research** and **policy initiatives** have resulted in a five-fold increase in food production and doubling of per capita production of food in the country.

From an uncomfortable state of **acute shortage of food**, widespread **hunger** and **heavy import dependence**, the country has emerged as a **net exporter** and **surplus producer** of many agricultural commodities.

India's agriculture has demonstrated significant performance in terms of output growth and sectoral income. From the mid-1980s to 2003-04, the growth rate in agricultural income – measured by Gross Value Added (GVA) at constant prices – remained below 3 percent. This rate increased to 3.5 percent during 2004-05 to 2013-14, and further accelerated to 4.1 percent during 2014-15 to 2022-23.

Particularly notable is the 7-year period from 2016-17 to 2022-23, during which agriculture achieved an **unprecedented annual growth** rate of 5 percent, a record in post-independence India. During this period livestock and fisheries accounted for respectively 5.8 percent and 9 percent growth.[1]

India maintains a comfortable stock of food grains which allows distribution of **free food grains** to **two-thirds of the population** and also export to support the **global food supply chain**. This steady growth in agriculture sector contributed to the national economy, underscoring the sector's crucial role in India's development.

Over the past five decades, India's agriculture sector has witnessed a structural transformation characterized by shifts in the **share of gross domestic product** and **workforce**. Its share in Gross Domestic Product (GDP) has markedly declined from 42 percent in 1970-71 to 18 percent in 2023-24, whereas in the workforce the figures are respectively 70 percent and 46 percent.

Further, the **agrarian structure** has also changed significantly, with a trend towards increasing fragmentation of land holdings. The number of holdings increased from 71 million in 1970-71 to 146 million in 2015-16. During this period the proportion of small holdings (less than or equal to 2 hectares) increased from 70 percent to 86

[1] Chand (2024)

percent of the total number of holdings, resulting in a **decline in average land holding** size from 2.8 hectares to **1.08 hectares**.

The provisional figures for the year 2021-22 indicate that the number of operational holdings increased to 168 million, out of which 88 percent are small-holdings. The average size of operational holdings is slightly less than one hectare.

These trends in the agriculture sector are likely to continue in the near future. According to the Vision 2050 prepared by the Indian Council of Agricultural Research (ICAR)[2], by 2050 the sector's contribution to GDP is projected to **decrease to about 7 percent**. Concurrently, its share in the workforce is expected to decline to 27 percent.

These changes highlight the **complex nature** of India's agriculture transformation and the difficulties in transferring labour to other sectors of the economy.

The combination of reduced share of agriculture in economic growth with no corresponding decline in employment share and shrinking land holdings indicate a future in which there can be challenges in **viability**, **sustainability** and **inclusiveness**.

Global Scenario

Globally[3] there are more than 608 million farms out of which small-holdings of less than 2 hectares contribute 84 percent. Out of these, 87 percent of small-holding farms are located in Asia. During the five decades after 1970, farm size in US and Canada increased from 157 and 187 hectares respectively to 178 and 331 hectares. Denmark, France, Netherlands have seen a tripling of farm size since the early 1970s.

In contrast, the concentration of small-holdings has remained very high in Asia, with an average farm size in Japan, which is a developed country, of around 3 hectares, whereas for Korea and China remaining below 1.2 hectares. Farm size in India, as I mentioned earlier, has declined to 1.08 hectares.

Changes in the structure of land holdings in **Asia did not follow the trend** witnessed in the advanced western countries.

[2] National Institute of Agricultural Economics and Policy Research, Indian Council of Agricultural Research (2015)
[3] FAOSTAT 2024

A Theoretical Perspective

In the development literature it is postulated that as an economy develops, it undergoes **structural transformation**. The share of agriculture in the economy's output declines and commensurately, the share of employment, as the economy moves from low income towards middle and higher income.

British economist W. Arthur Lewis (1954) described economic development as a growth process of **relocating resources** from agriculture, characterised by low productivity and traditional technology, to modern industrial sector with high productivity.

In his seminal paper "Development with Unlimited Supplies of Labour" (1954) Arthur Lewis addressed the mechanism of transferring surplus labour from traditional activity to modern capitalist sector under conditions of unlimited supply of labour. According to this model, wages in the modern capitalist sector are not determined by productivity of labour but by opportunity cost.

A '**traditional'** sector comprises **peasants, artisans** and **domestic servants**. The workforce increases with increased population. It is further augmented by entry of women into the labour force. With all this, it can provide the capitalist sector with 'unlimited supplies' of labour at a wage somewhat above the subsistence level.

As the economy grows, the **surplus labour** is **exhausted** and **wage rate rises**. The economy transforms from a dual to a **single integrated labour market**. The real wages rise with increase in productivity. This is the scenario according to the conventional growth models.

This approach focuses on a policy widely used by many developing countries to support industrialisation.

Ramesh Chand in his 2024 article argues that some assumptions of the Lewis model of development do not hold in the post-Green Revolution period. First, the Green Revolution shows that **technology** can play a significant role in modernising agriculture and in **generation of surplus** as visualised in the industry. Second, the assumption of **unlimited supply of labour** in agriculture holds no more.

His research also brings out some more interesting aspects. As the experiences of the last few decades of developing countries as well as fast-developing countries show, the **process of shifting workforce** out of agriculture is **very slow** and **not**

smooth. The share of agriculture in GDP is found to follow much faster decline while the share of employment falls at a much slower rate.

For example, during the three decades between 1991-2021, per capita GDP (measured in 2015 US $) increased by more than 10 times in China, 4.8 times in Vietnam, 3.4 times in India and 2.4 times in Indonesia. However, **this did not result in convergence of labour productivity** (Gross Value Added per worker) in agriculture and non-agriculture sectors.

The **highest disparity** in per worker productivity or income between agriculture and non-agriculture is witnessed **in China**. An agricultural worker in China generates one-fourth of the income generated by non-agricultural worker. India and Vietnam are close to China, while Indonesia shows lower disparity.[4]

The above experiences show that faster growth in non-agricultural – including industrial – sector did not lead to commensurate shift in workforce from agriculture.

"As a result, the share of agriculture in employment remained stubbornly higher than its share in output or income of the economy – three times in China, 2.5 times in India and Vietnam and more than 2 times in Indonesia."[5]

The IR (Inverse Relationship) Phenomenon

The relationship between farm size and productivity has been intensely debated in India during the last five decades. There is a vast literature on the subject. Renowned economists such as Amartya Sen (1962), A.M. Khusro (1964), U Patnaik (1972), T.N. Srinivasan (1972), Pranab Bardhan (1973), R.A. Berry and W.R. Cline (1979), Michael Lipton (1991), H.P. Binswanger *et al* (1995), and others have written on the subject of inverse relationship (IR) between farm size and productivity. **Several studies** show that crop productivity per unit of land is higher for small farms than large farms. **A few studies** in the 1980s indicated that the inverse relationship weakened and even disappeared when soil quality variable was included in their analysis.

While analysing **farm level data** – based on cost of cultivation surveys – during **my research** relating to agricultural risk, insurance and income in the early 1990s, I also found that farm size – both in terms of land area **per household** and **per person** – had a negative relationship with the value of output per hectare. The negative

[4] Chand (2024)
[5] Ibid

relationship with farm size was in existence also for **variable cost** and **income per hectare**.[6]

The primary focus of my research **was not** on the farm size and productivity relationship. The econometric model incorporated this aspect as an explanatory variable in order to separate the effect of IR phenomenon from that of crop insurance.

In the literature, a number of reasons have been put forward to explain the existence of the inverse relationship. They relate to (a) land-use intensity, (b) soil fertility, (c) irrigation and (d) labour intensity. Small farmers may use land more intensively in the sense that they keep land less unutilised than large farmers and, in some cases, doing more double cropping than the latter.

Another explanation is that large farmers have, **on average**, land of lower soil fertility than small farmers. **A third** explanation is that the inverse relationship results from an inverse relation between farm size and the proportion of farm area irrigated.

Ramesh Chand and others in their 2011 paper revisited the debate on farm size and agricultural productivity. They have estimated productivity and inputs used in all the crops grown by the farmers, and used those estimates to compare performance of the entire system of land-based activities across farm size categories. Their results indicate that land productivity – per hectare value of crop output – was inversely related to farm size.

A very comprehensive and exhaustive study on the IR phenomenon can be found in Chapter 2 of **Michael Lipton's 2009 book**, *Land Reforms in Developing Countries: Property Rights and Property Wrongs*.

Despite strong advantages in land productivity, small-holders earn a low level of income from agriculture on a per capita basis primarily due to very adverse land-man ratio. So, the issue is how a small-holder can generate enough income to take care of the livelihood needs of her family?

Increasing Income of Small-holders

Some analysts, citing examples of developed countries, suggest increase in farm size on consideration such as non-viability of small-holders and to derive economies of scale. If we do so beyond a given size, it could affect productivity of the agriculture sector.

[6] Mishra (1996)

On the other hand, the evidence of farm size and productivity discussed earlier points towards a policy to reduce **land inequity** to improve productivity – reducing size of large farms. Indeed, this provided the rationale for land ceiling legislations in the past. This has had limited success.

If it is not feasible to increase the land-man ratio, either through more equal distribution or shifting of a sizeable number of small-holders out of agriculture, what could be the way forward?

Before we suggest a way forward, it is worthwhile to look at some recent trends of India's agriculture sector and challenges for small-holders.

Some Trends in India's Agriculture Sector

As I mentioned earlier, India has achieved higher rate of agricultural growth in recent times. The **higher rate of agricultural growth** during the last two decades has been a result of **diversification towards horticulture, livestock** and **fisheries**. This was driven by **rising demand** for fruits, vegetables, dairy, eggs, meat, and fish as brought out by the latest Household Consumption Expenditure Survey data by National Sample Survey Office (NSSO).

Another aspect is that **non-farm income** plays a significant role in financial stability of a farm household. The "Situation Assessment of Agricultural Households and Land Holdings in Rural India 2019" by the Ministry of Statistics and Programme Implementation, Government of India, released in 2021 brings out interesting results. It contains **average monthly income from different sources** – crop and livestock; wages and salaries; and, non-farm business – of farm households with size classes of land. **Marginal farmers** (0.40 to 1.00 hectare) derive **one-third** of their income from agriculture (crop and livestock farming) and two-third from salaries, wages and non-farm business. **Small farmers** get a **half of their income** from crop and livestock. Farmers with **less land holdings** have **one-fourth or less** income from crop and livestock.

The share of non-agriculture sources in the **total household income** of farmers is increasing – **68 percent farm households** earn more income from non-agricultural sources than from crops and livestock production.

A study of Palanpur village, Moradabad district of Uttar Pradesh, over a period of seven decades from 1950s to recent years is documented in a book, *How Lives Change: Palanpur, India and Development Economics*. It shows, *inter alia*, that the

non-farm income of the households in Palanpur increased from 13.23 percent in 1957-58 to 46.36 percent in 2008-09. Thus, both **macro**- and **micro- level** evidence reveal the rising contribution of non-agricultural sources in the income of farm households, particularly small-holders.

Challenges for Small-holders

- Limited access to credit and dependence on informal sources of credit.
- Limited market access and lack of bargaining power. An FAO study shows that small-holder farmer receives only 25 percent of the final retail price for his produce, with intermediaries capturing a significant share of the value.
- A majority of small-holders will face poverty, particularly transient poverty, due to fluctuations in income.
- With low income their access to education and health may be limited.
- In the context of climate change and geopolitical tensions, small-holders can be more vulnerable.

Government efforts to help Small-holders

During the last several decades, governments – both at the Central and State levels – have taken initiatives to assist small farmers so as to enable them to improve their economic and livelihood situations. Autonomous organisations such as SFDA (Small Farmers Development Agency) and MFAL (Marginal Farmers and Agricultural Labour Development Agency) had been set up. Several schemes focused on small-holders.

As we have analysed earlier, there is a need to have a strategy to transform small-holders to become more viable in the sense of having income commensurate with or similar to those in the non-agriculture sector.

Suggestions for the Future

The following measures already in existence may have to be tailored to the needs of small-holders:

- Focus on horticulture, livestock and fisheries.
- Non-farm activities in rural areas.

- Use of technology in agriculture, particularly focusing on small-holders.

- Digital public infrastructure for agriculture as an open-source, open-standard and interoperable system would facilitate improving farmers access to market, prices, technologies, inputs, services and information.

- Developing climate-resilient crop varieties and agronomic practices.

- Storage to reduce post-harvest losses and enable farmers to store their produce and sell it at better prices.

- Contract farming arrangements to provide small-holder farmers with assured markets and stable prices.

- Direct farmer-consumer platforms such as farmers market and e-commerce platforms.

- Accelerate the pace of rural industrialisation. The idea is to create employment opportunities for rural youth in ancillary industries relating to inputs, equipment, machines and services.

- Credit and insurance.

- Farmer Producer Organisations (FPOs), Cooperatives and Self-Help Groups (SHGs) are vital in improving the lives of small-holders.

In short, the following broad approaches are relevant:

(a) Diversification towards more profitable crops, livestock and fisheries.

(b) New activities such as production of crops which can be utilised for biofuels production, and distributed generation of solar power on farms can yield higher income.

(c) Use of technology in agriculture is being facilitated. What is necessary is to develop and disseminate technology focusing on small-holders. Even start-ups can be encouraged.

(d) More focus on non-farm activities in rural areas.

It would be worthwhile to study the strategies and approaches followed by Asian countries such as China, Japan, and Korea that have a large number of small-holders.

Concluding Remarks

India's agriculture is dominated by small-holders and will continue to be so in the near future. There are 168 million operational holdings out of which small holdings of less than 2 hectares contribute to 88 percent.

During the five decades after 1970, farm size in US and Canada have increased from 157 and 187 hectares respectively to 178 and 331 hectares. Denmark, France, Netherlands have seen a tripling of farm size since the early 1970s.

In contrast, the concentration of small-holdings has remained very high in Asia, with an average farm size in Japan, which is a developed country, of around 3 hectares. In Korea and China remaining below 1.2 hectares. The farm size in India is about 1 hectare. Thus, changes in the structure of land holdings in Asia did not follow the trend witnessed in the advanced western countries.

The conventional postulate of shifting workforce from agriculture to non-agriculture will not hold fully. The movement will be slow as compared to its share in the GDP.

Agriculture's share in the GDP has markedly declined from 42 percent in 1970-71 to 18 percent in 2023-24, whereas in the workforce the figures are respectively 70 percent and 46 percent. A study shows that by 2050 the sector's contribution to GDP is projected to decrease to about 7 percent, whereas its share in the workforce is expected to remain at about 27 percent.

For a more inclusive, equitable and sustainable economic growth, it is necessary to have a higher share of income by farm households. The disparity in per worker productivity or income between agriculture and non-agriculture is witnessed even in countries such as China, Vietnam and Indonesia as in India.

Several studies show that crop productivity per unit of land is higher for small farms than large farms. There is an inverse relationship between farm size and productivity.

Despite strong advantages in land productivity, small-holders earn a low level of income from agriculture on a per capita basis primarily due to very adverse land-man ratio. So, the issue is how a small-holder can generate enough income to take care

of the livelihood needs of her family? Small farmers face several challenges relating to access to credit, marketing, education and technology.

During the last decade, governments – both at the Central and State levels – have taken initiatives to assist small farmers, including small and marginal farmers.

Several measures such as crop diversification, use of technology, climate resilient crop varieties, storage to reduce post-harvest losses, direct farmer-consumer platforms, rural industrialisation and setting up of Farmer Producer Organisations have been attempted.

Our analysis reveals that there is a need to have greater focus on small-holders and formulate a strategy to increase their income. The following broad approaches are relevant:

- Diversification towards more profitable crops, livestock and fisheries.
- New activities such as production of crops for biofuels and distributed generation of solar power on farms can yield higher income.
- Use of technology especially focusing on small farms.
- More focus on non-farm activities in rural areas.

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