

GLOBAL AGRICULTURAL DEVELOPMENT



History of Agricultural Development Ideas



- Divided roughly into three period
 - ▣ The Economic Growth-and-Modernization Era (the 1950s-1960s)
 - ▣ The Growth-with-Equity Era (the 1970s)
 - ▣ Macroeconomic and Institutional Reform (1980s and 1990s)

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Most Western development economists of the 1950s did not view agriculture as an important contributor to economic growth
- Little concerns about tropical agriculture/ rural life
- Development = structural transformation of the economy
- The decline in agriculture's relative share of the national product and of the labor force
- Agriculture = 'black box'

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)



- Albert Hirschman: “The Strategy of Economic Development” (1958)
- The concept of “linkages”: agriculture also has the income-generating activities that could be re-invested, but would lead to less rapid economic growth than investment in the industrial sector

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Passive roles of agricultural sector
 - ▣ Providing labor, capital, foreign exchange, and food to a growing industrial sector
 - ▣ Supplying markets for domestically produced industrial goods

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Influences of development practice
 - ▣ Western agricultural advisers assumed that they could directly transfer agricultural technology and models of agricultural extension from high-income to low-income countries
 - ▣ Tech. + Community development programs + Food aids
→ to help the rural poor
 - ▣ “U.S. Marshallian Plan”: rebuilding postwar Western Europe

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)



- Diffusion model of agricultural development
 - Farmers could substantially increase their agricultural productivity by allocating existing resources more efficiently/ by adopting agricultural practices and technologies from developing countries

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

□ Failures

- Many agricultural extension programs failed to achieve rapid increases in agricultural outputs in many countries
- Why?
 - Structural barriers: concentrated political power and asset ownership, low levels of investment in agricultural researches , policies that taxed and undervalued agriculture
 - Farmers were “marginal thinkers” and not irrational in comparing different agricultural techniques: Farmers were “efficient (with the existing technology), but poor”

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

□ Successes?

- New model: ‘investment in agricultural research and human capital’
- IRRI (*International Rice Research Institute*) and The CYMMIT (*International Maize and Wheat Improvement Center*) success in developing high-yielding varieties of rice and wheat → rapidly adopted in Asia during the 1960s and 1970s, “The Green Revolution”

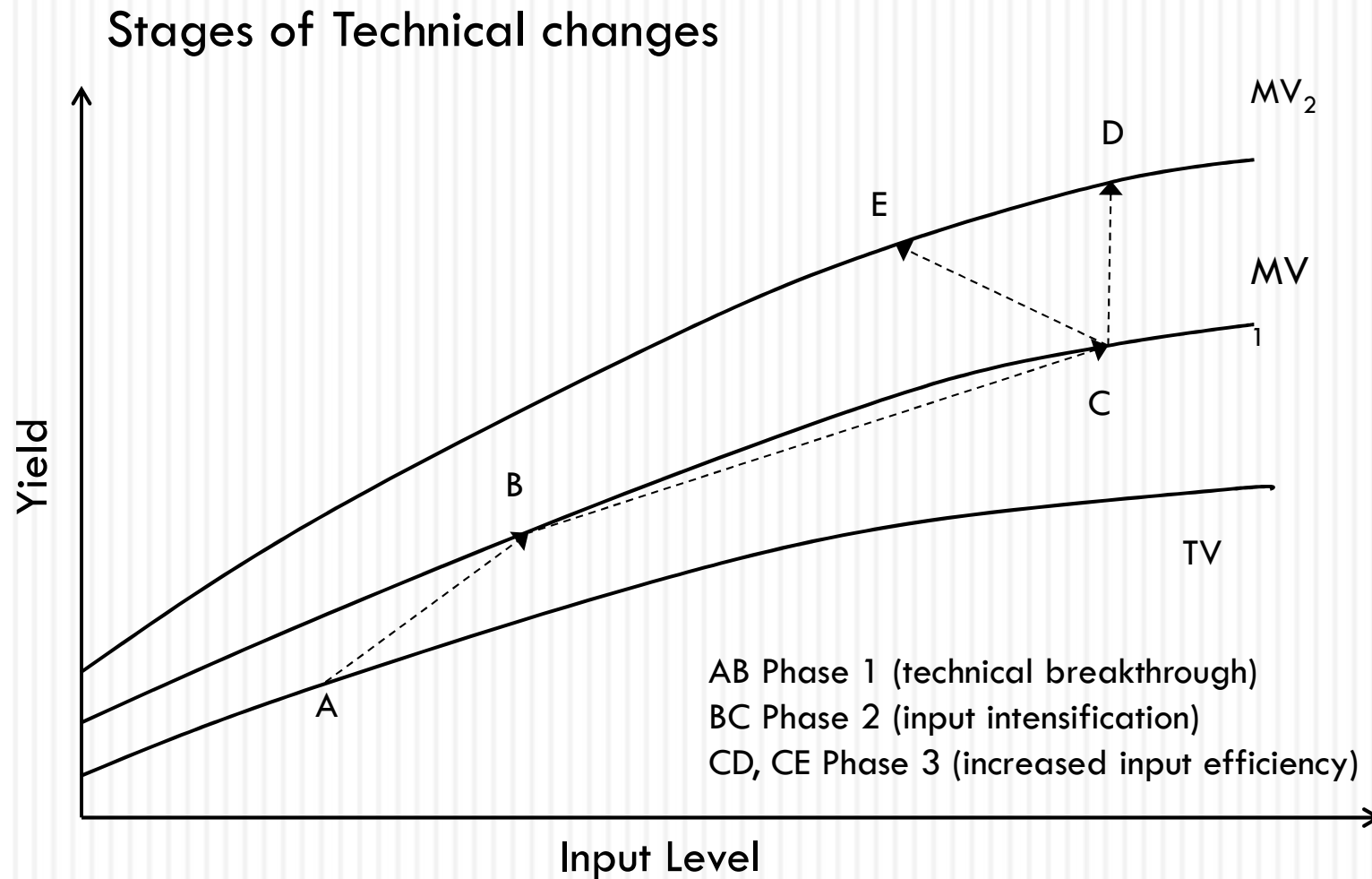
I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Green revolution
 - ▣ Intensification of agricultural production based on high-yielding cereal varieties & mechanization
 - ▣ Offer the opportunity to provide productive employment for the growing rural labor force
 - ▣ Solve the “Ricardian food bottleneck” problems: Chronic food shortages drive up wages and, thus, reducing investment in industry

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Green revolution
 - ▣ Rapid diffusion of modern varieties (MVs) throughout the irrigated areas of Asia
 - ▣ Varietal changes
 - Type A: when the original MVs developed by IRRI/ CIMMYT first replaced traditional varieties (TVs) → leading to sharp jump in productivity
 - Type B: newer MVs replaces older MVs → allowing productivity to sustain or extend over period

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)



I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Green revolution
 - ▣ Critics:
 - ▣ MVs: needs complementary inputs, esp. fertilizers
 - ▣ benefited mainly landlords and larger farmers and tenants, while 'impoverished small farmers' by inducing lower grain price and land losses
 - ▣ Still faced the structural barriers: export taxes for agricultural products/ industrial protection
 - ▣ Conventional wisdom that agri.was unresponsive to price incentives, taxes were used to finance state-led industrialization

Models of Agricultural Development

1. **Frontier Model**

- Expansion of area cultivated or grazed → Increase in agricultural production
- Pioneer settlement, 'opening up of the new continents'
 - ▣ North America, South America, Australia during the 18th-19th Centuries
- Establishment of new villages, opening up of forest/jungle land to cultivation
 - ▣ The Alps villages in Europe, the Chinese settlement of the lands south of the Yangtze
 - ▣ Shifting cultivation or nomadic grazing

Models of Agricultural Development

2. Conservation Model

- Advance in crop and livestock husbandry
- Associated with the English agricultural revolution
 - ▣ More intensive crop-rotation system → Increasingly complex land- and labor- intensive cropping systems
 - ▣ Arable land was allocated between permanent crop land and permanent pasture
 - ▣ More intensive use of new forage and green manure crops
 - ▣ Labor-intensive capital formation in the form of drainage, irrigation, and other physical facilities

Models of Agricultural Development

2. Conservation Model

□ Examples

- The wet-rice culture systems in East and Southeast Asia
- China in the late 1950s and early 1960s
- Crop-livestock production in Europe during the 18th-19th Centuries

□ Sustaining rate of growth in agricultural production around 1% per year over long period

□ However, still not compatible with rates of growth in the demands for agricultural outputs

Models of Agricultural Development

3. Urban-Industrial Impact Model

- Driving force: “*Rapid urban and industrial development*” → the more effective performance of the input and product markets linking the agricultural and nonagricultural sectors in regions
- Expanding demand for farm products, supplying the industrial inputs needed
- More improvement in agricultural productivity

Models of Agricultural Development

5. Induced innovation model

- To increase 'High-Payoff Input'
- **Technical innovation**
 - ▣ Induced mechanical and biological innovation
- **Institutional innovation**
 - ▣ The capacity of public and private sector research institutions to produce new technical knowledge
 - ▣ The capacity of the industrial sector to develop produce, and market new technical inputs
 - ▣ The capacity of farmers to acquire new knowledge and use new inputs effectively

□ Question:

- ▣ what determines the patterns of agricultural technology development (e.g. whether a country develops labor-intensive or capital-intensive technology)?
- ▣ Hayami & Ruttan: “Induced Innovation Model”
 - Ans. “Relative factor price”



■ Hayami & Ruttan: “Induced Innovation Model”

- Two types of economy
- 1. Those with inelastic supply of land (Japan, Taiwan)
 - “Land-saving” technology → “biological and chemical technology”
 - High-yielding crop varieties to facilitate substitution of fertilizers for land
- 2. Those with inelastic supply of labor (US, Canada, Australia)
 - “Labor-saving” technology → “Mechanical technology”
 - The substitution of animal and mechanical power for labor

The Industrialized World: Japan

- **From Meiji Restoration (1868-1912) to the 1960s:**

- Japan: the first non-Western nation to successfully industrialize
- Feudal : Traditionally low productivity economy → Westernization in the Meiji reforms
- Some two hundred peasant uprisings & four samurai revolts

I. The Economic Growth-and-Modernization Era (the 1950s-1960s)

- Radical Political Economy & Dependency Theory
 - ▣ Lack of solid micro foundation
 - ▣ Lack of attention to the biological/locational specificity of agricultural production
 - ▣ Inadequate attention to the need for technical change

- Former critiques: “Trickle-Down effects”



- Former critiques: “Trickle-Down effects”



TRICKLE DOWN THEORY EXPLAINED

'TRICKLE DOWN'

II. The Growth-With-Equity Era (the 1970s)

- Robert McNamara: the 1973 World Bank Annual Meeting
- Development failings of the 1950s and the 1960s
 - ▣ Slower overall growth rates
 - ▣ Food supplies per capita rose little or not at all, and related well-being of the poor could not be enhanced
 - ▣ Employment growth rate seemed to lag the population growth
 - ▣ Small concentration of growth and basic services in the urban areas

II. The Growth-With-Equity Era (the 1970s)



- Income gaps between the rich and the poor was widening; and contributed to social turmoil in many countries (Pakistan, Nigeria and Iran)
- Western development economists: give greater attention to employment and the distribution of real income

II. The Growth-With-Equity Era (the 1970s)

- Trends of development programs:
- Because majority of the poor in most developing countries were living in the rural areas; Agricultural productivity
- “Integrated Rural Development”: (IRD improving health, education, sanitation, and other social services
- Constraints: The projects were proved to be very complex and difficult to implement

II. The Growth-With-Equity Era (the 1970s)

- Trends of development programs:
- “Basic needs approach;”:
 - ▣ ILO, World Bank
 - ▣ Projects should give priority to increase the welfare of the basic poor directly
 - ▣ Nutrition, Housing, Education

II. The Growth-With-Equity Era (the 1970s)

- Trends of development programs:
- “Basic needs approach;”:
 - ▣ Constraints:
 - improvement in short-run, but could not satisfy rapidly growing populations
 - Unemployment
 - ▣ Donors moved away to the more growth-oriented strategies in the early 1980s
 - ▣ Interests between growth & income distribution relationship

II. The Growth-With-Equity Era (the 1970s)

- Other thoughts:

- ▣ From 'employment-output tradeoffs' → "Employment-oriented strategy"

- Mellor (1967)

- Growth linkage of the new grain variety

- "New high-yielding grain variety" → raise the income of the food grain producers → generate increased demand for a wide variety of labor-intensive products (dairy products, fruit, agricultural inputs,...)

II. The Growth-With-Equity Era (the 1970s)

□ Other thoughts:

■ Smallholders vs. plantation production

Arguments

- Small farms had higher potential employment and land productivity
- Smallholders stimulate more the demands for industrial products and speeding transformation of the economy

■ Market-oriented production

- Improving better infrastructure & information system

■ Farming system research/ Farm management

III. Macroeconomic and Institutional Reform Era (1980s and 1990s)

- End of the Cold War:
 - ▣ Economic restructuring throughout the world: IMF, World Bank, Bilateral donors
 - ▣ Unleashed economic growth in many countries (SEAs),
 - ▣ More outward-oriented strategies > Import substitution strategies
 - Reduction in global and regional trade barriers: NAFTA, ASEAN, GATT → WTO
 - stimulated rapid agricultural and agribusiness growth
 - ▣ but many were still being left behind in poverty (Africa)

III. Macroeconomic and Institutional Reform Era (1980s and 1990s)

- Market liberalization: “get prices right!!”
- Openness vs. Risks
 - ▣ More vulnerable economy:
 - Currency devaluation/ Crisis (SEAs in the late 1990s) → recession
 - ▣ High vs. low food-price trade-offs (production incentives vs. basic needs school)
- Framework of “Food policy analysis” (in the context of open-economy)
 - Form a bridge between two approaches: linked by food prices

III. Macroeconomic and Institutional Reform Era (1980s and 1990s)

- How small farmers can benefit from trade (international demands)?
 - ▣ “Reforms in supply side”
 - ▣ Breaking structural constraints (lack of technology, roads, vehicles)
 - ▣ Responsive agricultural institutions

III. Macroeconomic and Institutional Reform Era (1980s and 1990s)

- Growth of private sectors
- Large firms in industrialized countries: “Contracting”
- New Institutional Economics: Path dependency > Dependency Theories
- Reducing “One-size-fits-all” policies → needed to be tailored
- Good governance, decentralization, democracy, rules of law, NGOs
- Food insecurity & poverty, environmental sustainability

- **In this rapidly globalizing world, possibly the most fundamental problem facing us all is the continuing prevalence of poverty in so many countries while only a minority of industrialized countries enjoy wealth.**
- **The World Bank estimates that more than half of the world's poor live in rural areas, the majority of them subsistence farmers.**
- **“More than half a century of persistent efforts by the World Bank and others have not altered the stubborn reality of rural poverty, and the gap between the rich and poor is widening.**
- **Most of the world's poorest people still live in rural areas and this will continue in the foreseeable future”**
- **(World Bank, 2002)**

Can success in agricultural transformation make a major contribution to solving this problem, and if so, how?

If it does, in what ways does it matter, and how can such transformation be brought about?

How critical is the role of agriculture in economic development?

Among development economists, there are two polar views regarding the centrality of agriculture's role in building the wealth of a nation

TWO POLAR VIEWS

Pro-agriculture view:

- The five potential contributions of agriculture to the structural transformation of an economy: food, fiber, raw materials, labor, and financial surplus (including foreign exchange)
- To invest in agriculture is essential to generate a surplus for industrialization and jumpstart the process of industrialization in its early stages, during which, by definition, the industrial sector is small.
- This view did not, however, explicitly claim that rural poverty would be significantly reduced in the process

TWO POLAR VIEWS

Anti-agriculture view:

- The “squeeze agriculture” development strategy
- Economies can bypass this process of agricultural development and instead invest in building an industrial base (while extracting agricultural surplus for industrial investment).
- Agriculture could be exploited, but it was not necessary to invest in the sector for it to contribute to economic growth.
- Many believe “resources devoted to slow growing agriculture as wasted” (Timmer, July 2005).
- The entire import-substitution industrialization (ISI) strategy, popular among developing countries in the 1950s, is predicated on the belief that investing in agriculture is a bad strategy

TWO POLAR VIEWS

Anti-agriculture view:

- The early development economists (Rosenstein-Rodan, 1943 ; Lewis, 1954 ; Hirschman, 1958 ; Fei and Ranis, 1964) treated agriculture as a passive sector with weak links to non-agriculture, a resource reservoir from which to extract labor and other resources to invest in industry, considered to be the leading sector.

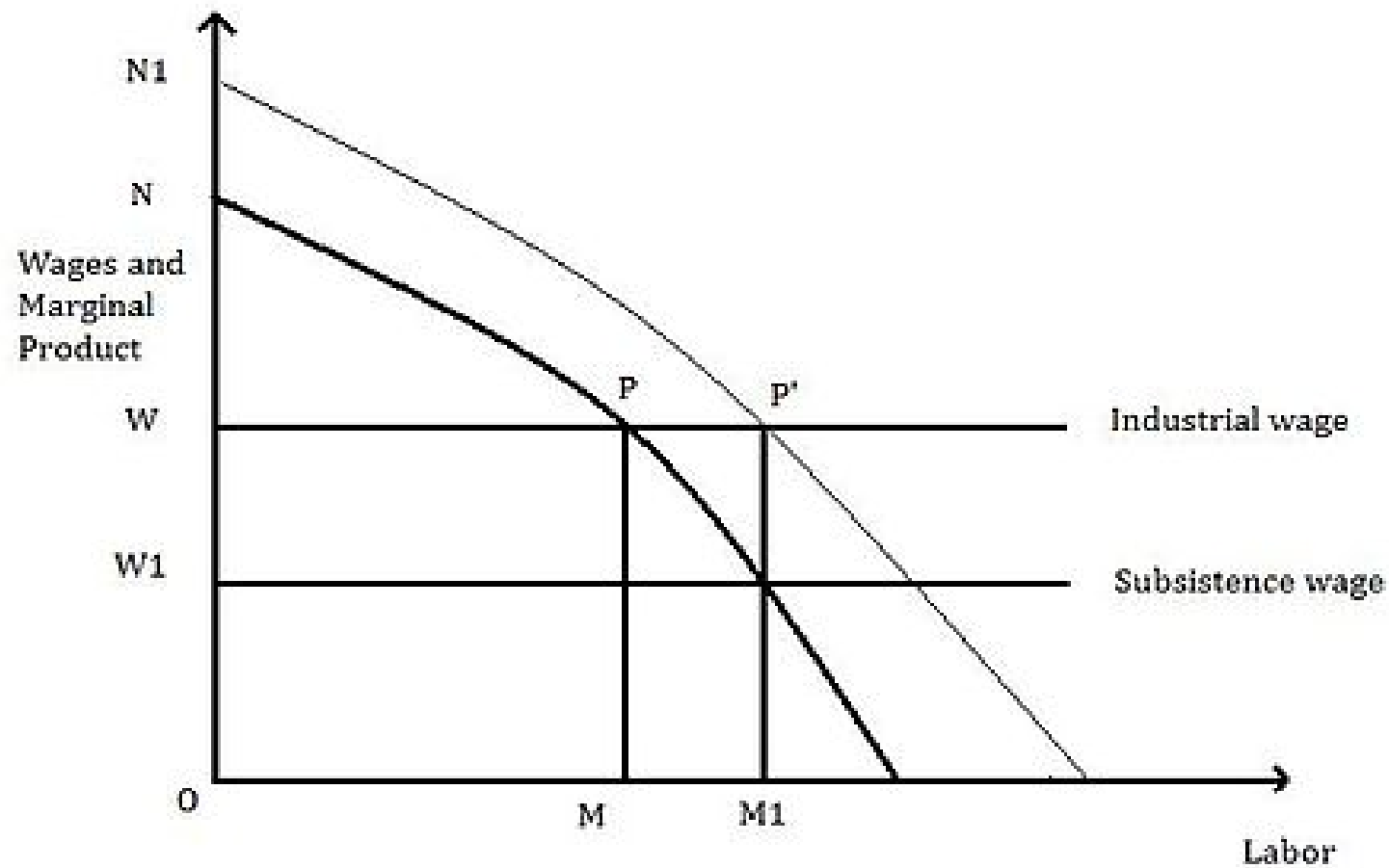
TWO POLAR VIEWS

Lewis' Dual Sector Model:

- In the Lewis model, expansion of a two-sector economy is fueled by unlimited supplies of rural labor.
- Expansion of the capitalist sector would continue until capitalist and rural wages were equal.
- When the capitalist sector expands, it extracts or draws labour from the subsistence sector
- Assumption: the supply of unskilled labour to the capitalist sector is unlimited and the marginal product of an additional farmer is assumed to be zero but the additional labour also drives down marginal productivity and wages in the manufacturing sector

TWO POLAR VIEWS

Lewis' Dual Sector Model:



TWO POLAR VIEWS

Both agreed that the sector was necessary to generate the surplus needed by industry in its early stages but disagreed on the importance of agricultural investments to generate such surplus.

CASE STUDIES

- England, the first country to experience both agricultural and industrial revolutions [in the 18th and 19th centuries],
- Japan, the first non-Western country to industrialize [since the Meiji Restoration in 1868 until the 1960s]
- The United States, a major industrialized country today with abundant rural labor (CARL) in the early stages of its industrialization [from the mid-19th to the 20th century].

UK

- Before the agricultural revolution, increases in output required increases in area or a reduction in fallow.
- the core of the revolution was “ an increase in cereal yields per acre that is the amount of grain that could be produced from a given area and sown with a particular crop” (Overton, 1998).
- Increases in output were brought about by increases in productivity instead of area expansion.

UK

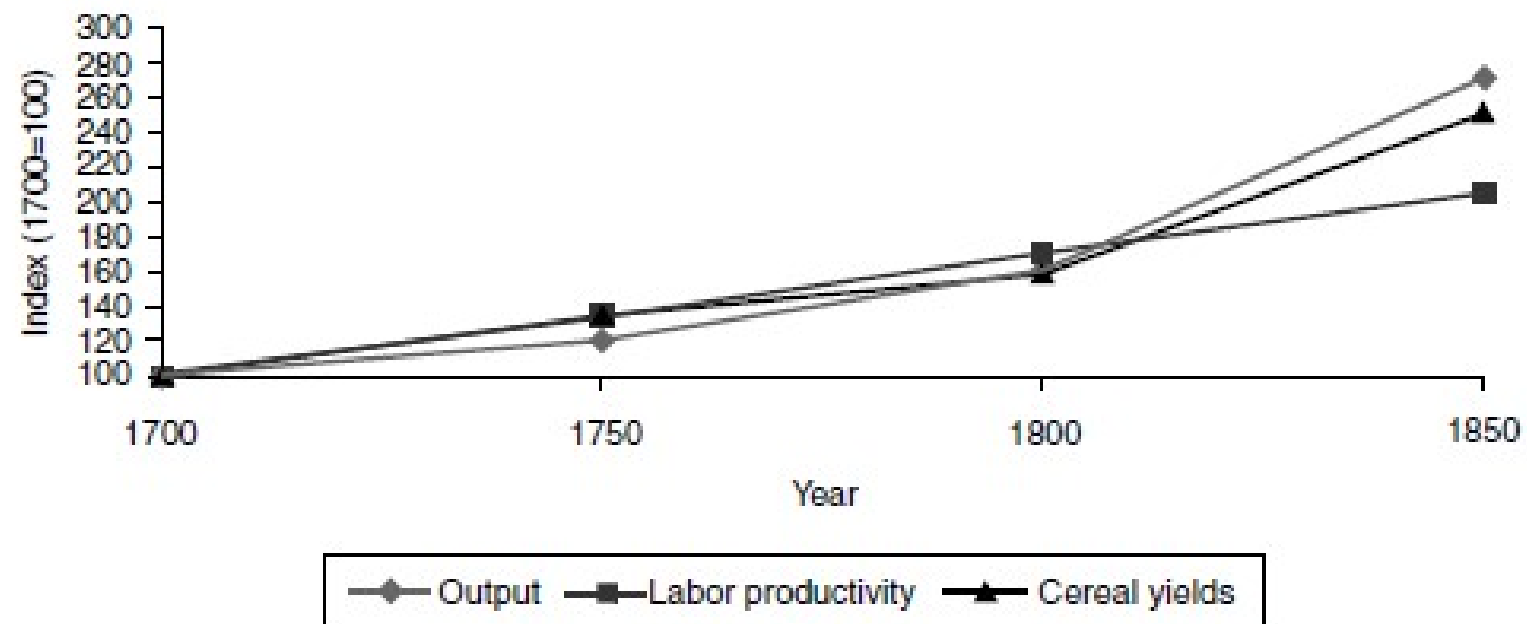
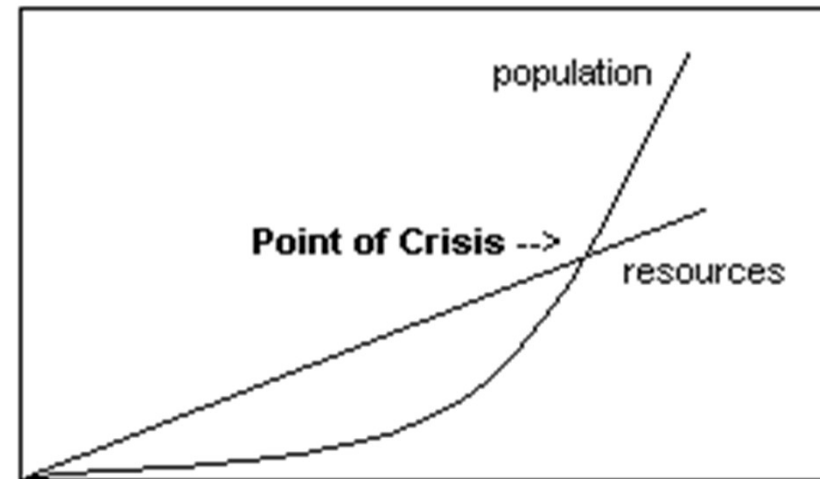


Figure 1.1. Sustained productivity and production increases in English agriculture (1700–1850).

Source: Overton (1998: table 3.11).

UK

- It escaped the dire consequences of the Malthusian Law of Population, whereby population grows at a geometric rate while food supply grows at an arithmetic rate.
- According to Thomas R. Malthus (1766–1834) the excess of population growth over food supply is brought back into balance by a higher death rate, inflicted upon humanity through various calamities – for example, war, famine, and disease – unleashed as the pressure for food intensifies



Malthus' Basic Theory

UK

Two main concepts of the revolution.

The narrow concept: The main changes identified by the “cows and ploughs” concept were

- (a) The introduction of nutritious fodder crops, in particular turnip and clover, and the adoption of a four-course rotation system of wheat–turnips–barley or oats–clover or rye-grass (the so-called Norfolk four-course rotation);
- (b) The reduction of bare fallows due to the four-course rotation system;
- (c) The use of mechanical seed drills instead of broadcasting seed and the increasing use of agricultural machinery – for example, threshers and reapers;
- (d) The marling of light soils and the draining of heavy clay soils;
- (e) The improvement of livestock breeds.

UK

Two main concepts of the revolution.

The broader concept: The institutional changes referred to in the broader concept of the agricultural revolution include

- (a) The removal of common property rights as more and more commons became private property through enclosure mandated by successive acts of Parliament (this process accelerated between 1790 and 1820) and the consolidation of small farms into large farms
- (b) The geographical expansion of markets as different methods of transport improved, with improvements in systems of market information and the development of the daily mail (1840), and as the medieval system of industrial/commercial regulations was being dismantled in favor of competition;
- (c) The prevalence of a tripartite landlord–tenant farmer–laborer structure of a commercialized agriculture within which the landlord–tenant farmer relationship had responsibilities clearly delineated and which imparted security of tenure (even if there was no legal sanction);
- (d) A fluidity between country and town people, namely the landed gentry and the urban business community, which benefited estate management through the infusion of both capital and business ideas
- (e) The institution of agricultural societies.

UK

- There was a steady decline in the share of the population and workforce that was entirely dependent on agriculture for a living

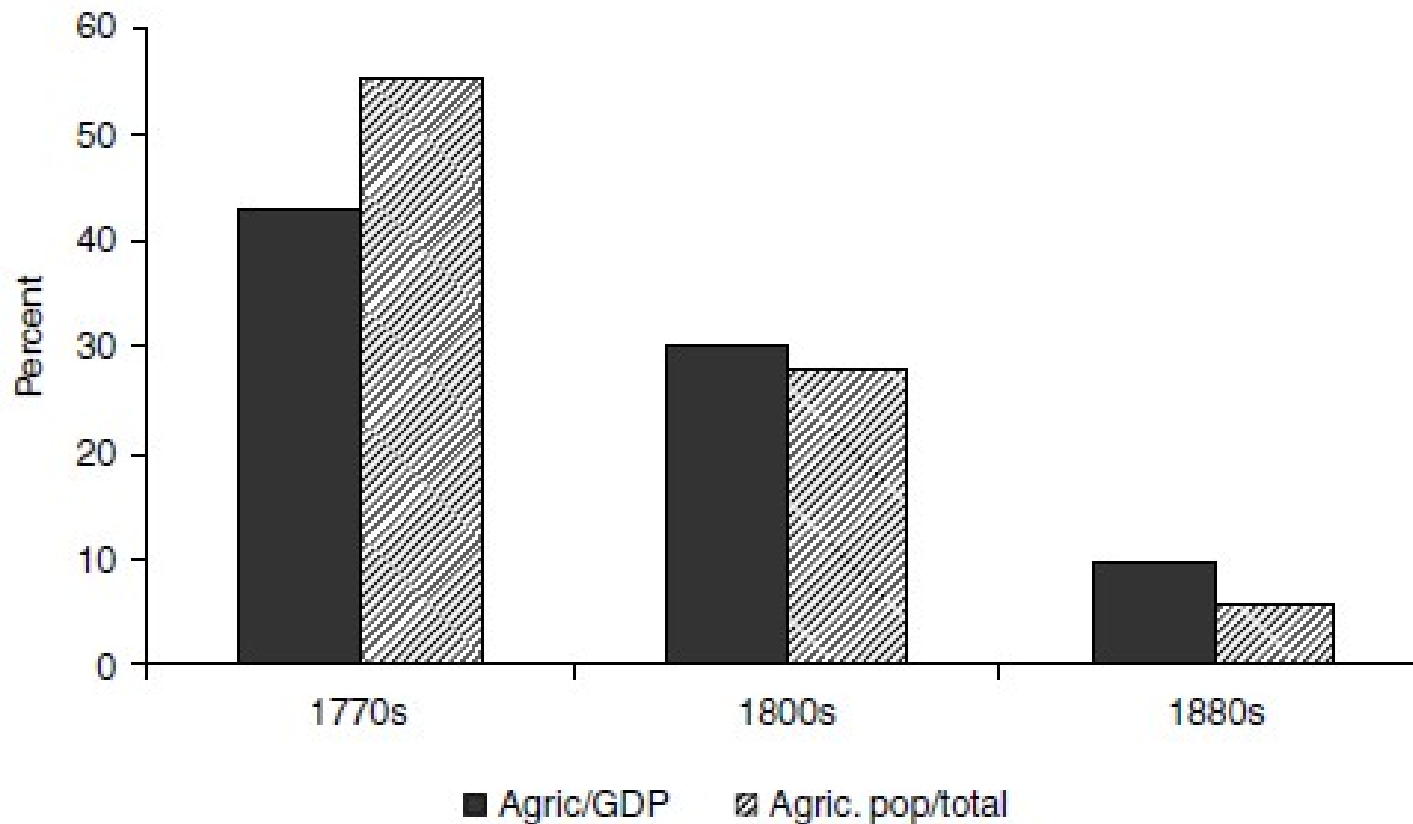


Figure 1.2. Selected key structural changes in England (1700–1880).

Sources: Agriculture: Chambers and Mingay (1966); agricultural population: Mingay (1996).

UK

- In particular, agricultural productivity growth
 - (a) fed an increasing labor force,
 - (b) generated financial resources for non-agricultural investment,
 - (c) expanded rural purchasing power for industrial commodities.
- England's experience thus refutes the polar anti-agriculture claim that a country can bypass agricultural development and still achieve industrialization

UK

- From agricultural wage data alone, we can see that the rural poor suffered real wage decreases for a long time, at least until the mid-19th century.
- In the 18th century, most labor was not mobile. So the beneficiaries of increased industrial demand for labor in the 18th century and the earlier decades of the 19th century were mainly in the Midlands and the north, and around London.



Figure 1.3. Wheat prices, agricultural money, and real wages, 10-year averages (1700–49 = 100). The corn laws were repealed in 1846.

Source: Overton (1998: table 3.1).

UK

The poorer agricultural classes also lost through the enclosure movement, as the consolidation and expansion of large farms came at the expense of small farms (a small farm is 100 acres or fewer). By the 1850s, small farms were a minority.

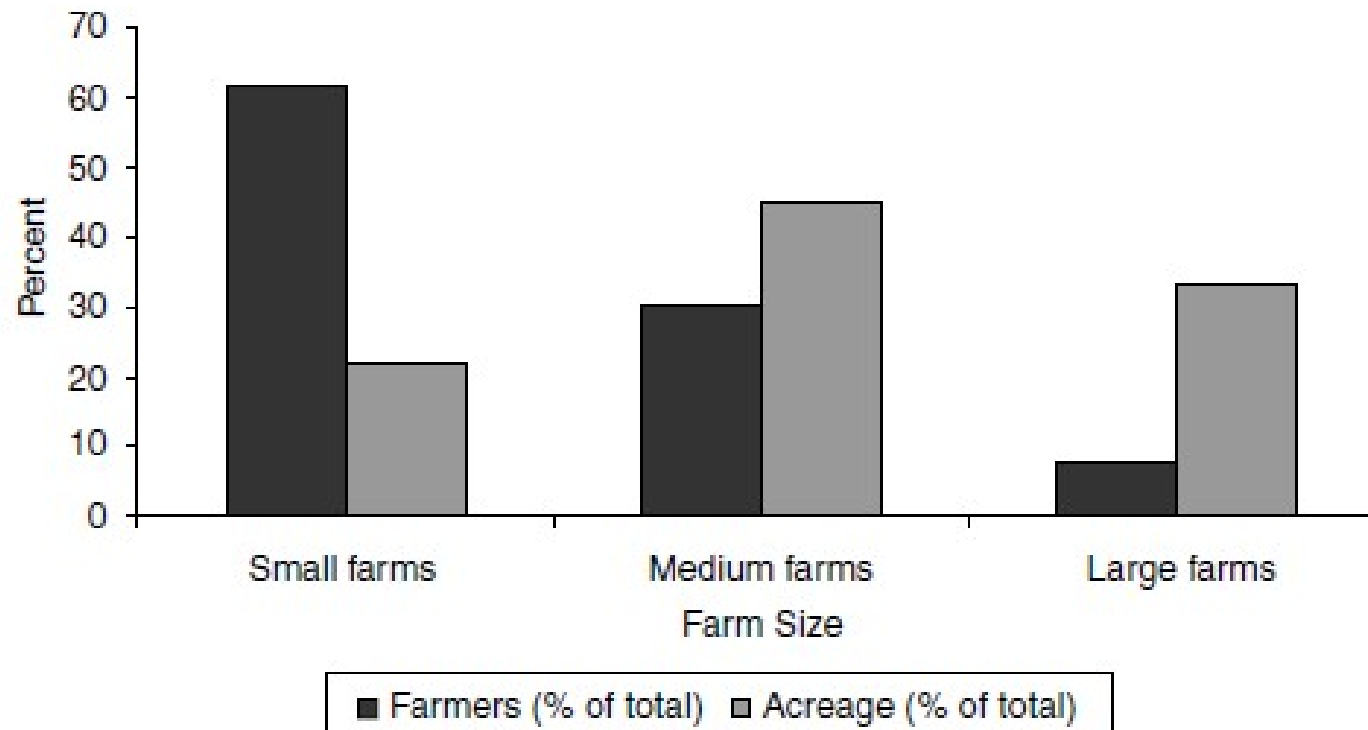


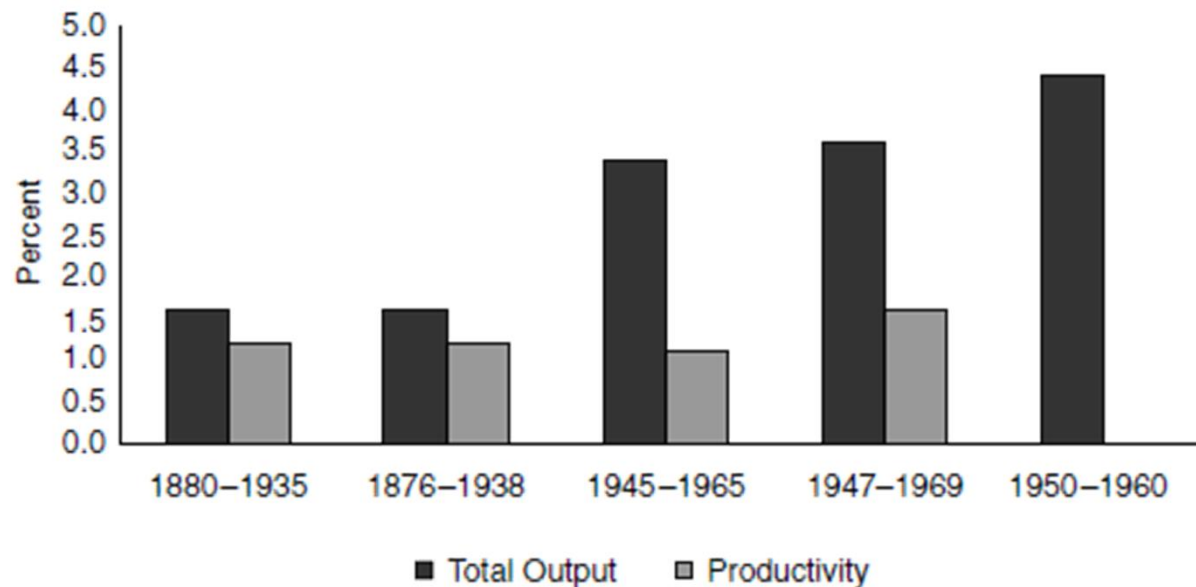
Figure 1.4. Distribution of farmers and agricultural land by farm size (1851).
Source: Chambers and Mingay (1966).

UK

- The laboring class would benefit from such integration but only in the long term (around the mid-19th century) when agriculture had become fully commercialized.
- There was increased agricultural investment, which gradually included the purchase of industrially manufactured farm implements.
- The expansion of export and re-export trades generated much wealth, which was reinvested in agricultural land by the successful merchant class.
- Industrial expansion reduced surplus agricultural labor by the mid-19th century, leading to a sustained though slow improvement in wages and the living conditions of laborers - the increasing integration of agriculture and the rural economy into the expanding industrial sector – for example, increasing employment opportunities in textile mills and the expanding railway, road, and canal systems.
- A virtuous circle of agricultural and industrial integration and expansion had set in.

JAPAN

- Japan was the first non-Western nation to successfully industrialize.
- Before 1868, prior to the Meiji Restoration, Japan was feudal under Tokugawa rule for some three hundred years with a traditional low productivity economy. Under Meiji rule (up to 1912) was a sharp departure from the nearly three hundred years of stagnation and serfdom during the Tokugawa period (1603–1867).



Annual average growth rates during the pre-war period (1880–1935, 1876–1938) were roughly half of those of the post-war period (1945–65, 1947–69).

Figure 1.5. Japan: selected agricultural growth rates (percent, per year, 1880–1969).

Sources: Yamada, Saburo and Yujiro Hayami (1979); Tomich, Thomas P., Peter Kilby, and Bruce, F. Johnston (1995).

JAPAN

Broad Concept:

- *Land Tax Reform*
 - The land tax was levied in cash on the real value of the land which was measured by its productivity.
 - The tax rate which was fixed was lowered from 3 percent to 2.5 percent of the assessed base in 1876 and it promoted incentives to increase farm investment and productivity and to commercialize agriculture
 - Predictable tax rates were levied on individual parcels of land instead of on villages as entities and agriculture was already dominated by small-scale farmers by then
- *Public Investment*
 - Government invested heavily in transportation and communication which enabled proven techniques developed by small farmers to spread throughout Japan
 - Irrigation expanded; water control and drainage improved.
 - Researchers at the experiment stations directed the extension activities of farmers' associations.

JAPAN

Narrow Concept:

- The fundamental institutional and infrastructural reforms implemented by the Meiji rulers created supportive incentive for adopting yield-increasing agricultural techniques.
- The government also promoted yield-increasing agricultural innovations. It sought Western advice (e.g., from the German scientist Justus Liebig) on plant nutrition.
- Research stations experimented with improving rice varieties by pure line selection and then artificial cross-breeding of high-yield, fertilizer-responsive rice varieties which had fostered a “fertilizer-responsive rice culture” over time.
- The use of chemical fertilizers began to spread as early as 1880.

JAPAN

- Agriculture's rising productivity and surplus financed investments in manufacturing and other non-farm sectors, such as transport.
- The land tax was an important vehicle for transferring resources for investment in non-agriculture. From 1883 to 1887, agriculture paid taxes equal to 20 percent of net national product, while non-agriculture's share was only 2 percent. This agricultural tax contributed 80 percent of the tax revenues in 1888–92 and around 40 percent between 1918 and 1922.
- Deposits from farmers and from big landlords in cooperatives and other institutions) were also important contributors to non-farm growth, as they financed the launching of many small-scale factories.
- These rural non-farm companies (in the light industry (e.g., food processing, textiles)) were a major source of employment and income for farmers and accounted for nearly 70 percent of total manufacturing output during 1878-1900.

JAPAN

- Cotton textiles became the most important industry.
- In response to the militarist ambitions of the government, heavy industry – for example, chemicals, metals, and machinery – was developed.
- In the 1930s, Japan (unlike many other countries) experienced rapid growth, at 5 percent per year.
- In pre-war Japan, the land/labor ratio in agriculture rose because expanding labor demand for non-agriculture absorbed surplus agricultural labor.

JAPAN

The post-war period

- When the Allied occupation ended in 1952, per capita GNP was only USD 188. Although it was poor like many other developing countries, Japan was distinguished from those countries by certain features, including significant infrastructural and institutional investments in agriculture, a highly literate and skilled labor force, and substantial managerial and engineering skills.
- From 1959 to the early 1970s, agriculture grew at around 4 percent per year, while the Japanese economy grew at an average annual rate of 10.8 percent.

JAPAN

- During the Meiji era, incomes of farm families increased due to increased productivity, mainly in grain and sericulture.
- It is estimated that Japan's real income increased by as much as 65 percent as a result of Japan's entering world trade, with agricultural exports being major.
- **Post-war Land reform:**
 - Landlords who did not live in the countryside could not own land. Those who did live in the countryside could rent out (except for landlords on the island of Hokkaido) a maximum of one chobu (roughly a hectare). The maximum landlords could retain was four chobu .
 - Reform greatly increased purchasing power among most of the rural population, as former tenants, now owners, did not have to make large rental payments.

JAPAN

- In 1960, the share of agriculture in GDP, which was 14 percent, declined to 3 percent in 1985. Farm–urban labor migration was already high.
- Despite the rapid integration of farm labor in the non-agriculture labor markets, the income differential between farm and non-farm households widened, increasing pressure for protectionism to boost farm incomes.
- By the 1960s, agriculture policy became primarily an income support rather than a production-promoting policy. [The Agricultural Basic Law of 1961 enshrined the restrictions and price support policies that protect agriculture].
- By 2001, the share of agriculture dwindled to 1 percent of the GDP, but the cost of its protection remained high.

JAPAN

- Japan's experience supports but qualifies the pro-agriculture view.
- After the land reform and after the industrial takeoff, the demand for and wages of rural labor were raised
- Japan's meteoric rise as an industrial power from around the late 1950s to the 1970s is a refutation of the view that a country can do without high-productivity agriculture on the road to industrialization.

DEVELOPING WORLD

Two scenarios

1. Sustained high output and productivity growth in agriculture coexisting with persistent high rates of rural poverty and mediocre overall economic growth, or
2. Stagnant low-productivity agriculture co-existing with high rates of overall economic growth and low(er) rates of rural poverty

DEVELOPING WORLD

*Agricultural development, overall growth, and rural poverty reduction:
which combinations do we find over decades of development?*

	Economy doing well, widespread rural poverty decreasing	Economy not doing well, rural poverty widespread
Agriculture doing well, sustained output and productivity growth	Pro-Ag 1	Anti-Ag 1
Agriculture not doing well, stagnant output and productivity growth	Anti-Ag 2	Pro-Ag 2

INDIA

- At independence in 1947, India was and today still is a low-income country. In 2000, the incidence of poverty was estimated to be around 29 percent, somewhat less than a third of its population of around 1.03 billion people.
- Agriculture's contribution to employment has remained important, however, declining gradually from around 70 percent in the early years to 67 percent in the 1990s. This is indicative of significant surplus labor in agriculture.
- In the early years of the Green Revolution (1960s), irrigated rice and wheat were the main beneficiaries. More recently, the widespread adoption of improved technologies across regions and crops in the 1980s was a major factor in the acceleration of growth in the 1980s.

INDIA

- A major achievement of India's agricultural policy by the 1990s was the attainment of food grain self-sufficiency. Ensuring affordable grain helped the poor.
- The grain sector, dominated by rice and wheat, occupies some 40 percent of cultivated area and contributes about 26 percent of the agricultural GDP.
- India's food grain production has increased fourfold, from about 51 million tons in 1950–51 to some 200 million tons in 2000–2001. However, due to continuing high population growth, the increase in per capita availability of food grains per day has been modest.

INDIA

- The Targeted Public Distribution System (introduced in 1997) supplies rice, wheat, and sugar nationally, and other commodities such as edible oils and coarse grains in some states, at subsidized prices. Major benefits include the following.
- Producers get minimum support prices, thus reducing uncertainty.
- The subsidies have also contributed to the adoption of improved technologies and to increased productivity. Yields on major crops such as rice, wheat, sugarcane, and cotton have increased significantly.
- However, to support the system of pricing and distribution, private trade is restricted, and many controls exist on marketing, small-scale reservation (only small-scale units are allowed to operate), and so on. As a result of these many controls, processing and marketing efficiencies are low – for example, in sugar, oilseeds, and cotton.

INDIA

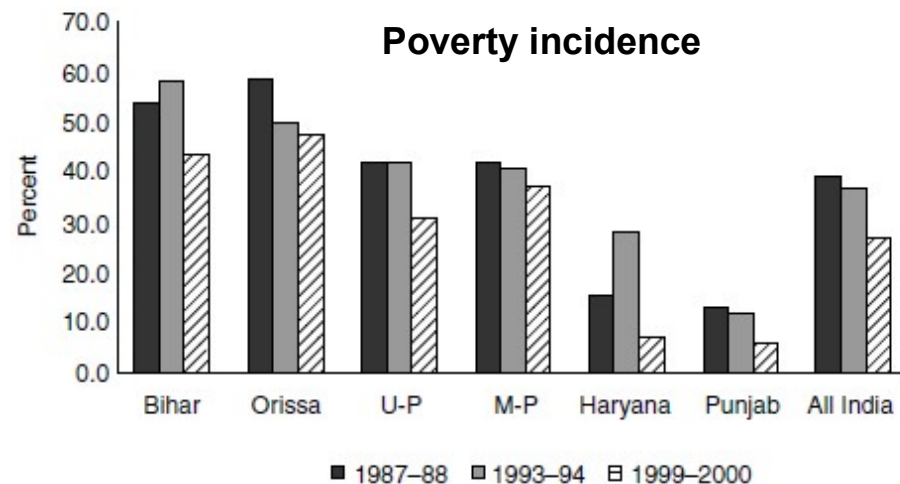
- Despite the positive productivity developments in the 1980s, large parts of Indian agriculture are said to be dominated by traditional, low-productivity, subsistence cultivation methods. However, no quantitative assessments of the extent of subsistence farming are given.
- The deceleration in the 1990s has been attributed to, among other things, a decline in these public investments, a rise in natural resource degradation, and continuing constraints of a highly regulated market.
- The pattern of land distribution is highly skewed, with a high concentration of land in the hands of a few land owners on the one hand and the growing number of marginal and sub-marginal farmers on the other. This distribution does not take into account the quality of land on farms.

INDIA

- How beneficial agricultural growth has been to broad-based income growth and poverty reduction can vary sharply among states, as a comparison of the richest and poorest states shows.
- Punjab is one of the richest states in India, and it is the state where the Green Revolution took off in the mid-1960s. From 1967–68 to 1987–88, Punjab recorded high annual growth rates of 4.9 percent in wheat, 15.6 percent in rice, and 6.6 percent in food grains.
- This growth did stimulate growth in other sectors but the non-agricultural growth rate fell far short of the levels achieved in Taiwan, South Korea, and Japan, whose economies were transformed in two decades.

INDIA

- This is in contrast to the non–Green Revolution states of Bihar and Orissa, where agricultural growth rates have been way below those of the Punjab. They are the poorest Indian states and home to more than half of India's poor, more than two-thirds of whom are rural. Their agricultures did not get the boost from the Green Revolution that the agricultures of Punjab and Haryana did
- They are characterized as semi-arid tropics (SAT), areas where irrigation accounts for less than 50 percent of net cropped area.
- SAT areas are characterized by long dry seasons, and inadequate and unpredictable rainfall.



INDIA

- The case of India illustrates our combination Pro-Ag 2, which refutes the anti-agriculture view that agricultural development does not matter.

*Agricultural development, overall growth, and rural poverty reduction:
which combinations do we find over decades of development?*

	Economy doing well, widespread rural poverty decreasing	Economy not doing well, rural poverty widespread
Agriculture doing well, sustained output and productivity growth	Pro-Ag 1	Anti-Ag 1
Agriculture not doing well, stagnant output and productivity growth	Anti-Ag 2	Pro-Ag 2

CONCLUSION

The Meaning of “Success in Agricultural Transformation”

“Success in agricultural transformation” refers to two simultaneous developments in both efficiency and distributional dimensions:

1. Increases in productivity (output per unit of input, variously defined) sustained over two to three decades at least; and
2. Sustained increases in income for the majority of farm/rural households.

CONCLUSION

The Meaning of “Success in Agricultural Transformation”

Quantitatively, and at macro and sector levels, the process of agricultural transformation is characterized by

- (a) A declining share of agriculture to gross domestic product (GDP);
- (b) A declining share of agricultural employment to total employment;
- (c) Positive growth in productivity sustained over several decades; (productivity increases are measured by total factor productivity (TFP) growth)
- (d) Steady income increases over several decades for at least 50 percent of rural households.

FIVE CONDITIONS THAT ARE COMMON TO ALL SUCCESSFUL AGRICULTURAL TRANSFORMATION

- 1. A stable framework of macroeconomic and political stability. The central and local governments are able to enforce peace and order.**
- 2. An effective technology-transfer system. Research and extension messages reach the majority of farmers.**
- 3. Access to lucrative markets. The majority of farmers face expanding markets of paying customers. To them, investing in agricultural and rural production is good business.**
- 4. An ownership system, including a system of usufruct rights, that rewards individual initiative and toil. It is feasible for farm/rural families to gain monetarily from risk taking and hard work.**
- 5. Employment-creating non-agricultural sectors. As agriculture becomes more productive, it must shed labor, which unless absorbed in non-farm jobs that pay as well as agriculture would simply constitute exporting farm poverty to other sectors.**

CONCLUSION

What is not obvious is how some governments have been able to maintain them over decades.

How governments have succeeded in maintaining them has varied from country to country.

Underlying all five conditions is *sustained government investment in and delivery of public goods and services over decades* .

In short, creating an environment to sustain agricultural transformation requires strong, development-minded, and competent governments to take charge.

Such investment creates a stable environment within which market opportunities flourish and are accessible to all.

And it enables generations of farmers, in particular the majority of smallholders, to invest in the productivity of their farms and profit from such investment.

It also enables farm and rural households to diversify their risks and returns by including non-farm incomes and opportunities in their portfolio.