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PUBLIC POLICY AND MANAGEMENT

Agriculture and Economic Development

Development Policy
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The Green Revolution of the 1960s

- Most countries were rice deficit: Burma and Thailand were major exporters
- India, China and Indonesia's import requirement 3x total exports from the rest of Asia
- Rice yields in 1964 lower than 1939 → underinvestment in infrastructure, research, logistics, fertilizers
- 1955 2% of landowners in Mekong Delta controlled 45% of land.



'HAVE-NOT' NATION—The Chinese, with their steadily increasing population, are a prime example of a people who cannot possibly subsist on what they harvest. Last year crops there were



'HAVE' NATION—South Vietnam is one of the six Asian countries that raise more foodstuffs than the population consumes. The others: Burma, Thailand, Cambodia, East Pakistan and Taiwan. [Above, Vietnamese women planting



rice.] The war has lessened considerably, but not ended, the crop surplus—which last year amounted to a third of a million tons. Here,

'A Grain of Rice Is Worth a Drop of Blood'

By BERNARD B. FALL

THE late French statesman Georges Clemenceau is credited with the maxim: "A drop of oil is worth a drop of blood." Today in Southeast Asia and the Far East, Clemenceau's quip might well be changed to read: "A grain of rice is worth a drop of blood." And perhaps Red China and North Vietnam are willing to pay the price.

tion, with wheat a poor second at 20 per cent and corn an unimportant third at less than 10 per cent. In what used to be called "normal" times, a poor crop in China and India meant the death through outright starvation of perhaps 7 million people; and even today, with American, Canadian or French wheat surpluses available, a middling crop in Asia can wipe out economic progress for that year as the hungry countries deplete their hard-

1959: "If India's food production increases no faster than present rates, the gap between supplies and target will be 28 million tons by 1965-66. . . . No conceivable program of imports or rationing can meet a crisis of this magnitude." (Emphasis in the original text.) Indeed, Indian grain production dropped from 81 million tons in 1960 to less than 77 million in 1963 and is hardly likely to reach the bare minimum of 100 million tons planned for the end of the current economic plan.

ent struggle; excepting Malaysia and Laos, these countries constitute the only food-surplus area in Asia and the only fertile part of the continent that could be called "underpopulated." Thailand alone, for example, normally is the world's fourth-largest grain exporter, after the United States, Canada, and France; and if it were exploited as intensively as parts of China and all of Japan, it could probably export three times as much. The same holds true for the other countries of the



Five roles of agriculture in economic development

- Surplus labor in the agricultural sector is transferred to manufacturing and modern services (Lewis Model)
- Agriculture produces “wage goods” and raw materials that are used in industry
- Exports of agricultural products are a source of foreign exchange
- Agricultural production generates tax revenue often in the form of export or land taxes
- Agricultural producers are a domestic market for manufactured goods.



Michel Kalecki and the wage goods constraint

- Workers spend most of their money on necessities (food) produced in the agricultural sector
- As the labor force in industry expands, demand for food rises (workers have more money to spend)
- If the supply of food does not increase, then prices will rise
- Rising money wages eliminate employers' surplus, and slow down investment in the modern sector
- Supply in the agricultural sector is price inelastic: it is held back by “institutional factors”



Michał Kalecki



The marketed surplus and agricultural productivity

- Demand for food increases outside of agriculture as the modern sector grows.
- If *labor* productivity in agriculture does not increase, the “marketed surplus” (food produced above the amount consumed within the agricultural sector) will not rise.
- Increasing labor productivity in agriculture reduces rural poverty.
- More productive farms stimulate the growth of off-farm employment, including agro-processing industries and farm inputs.



Labor and land productivity in developing Asia





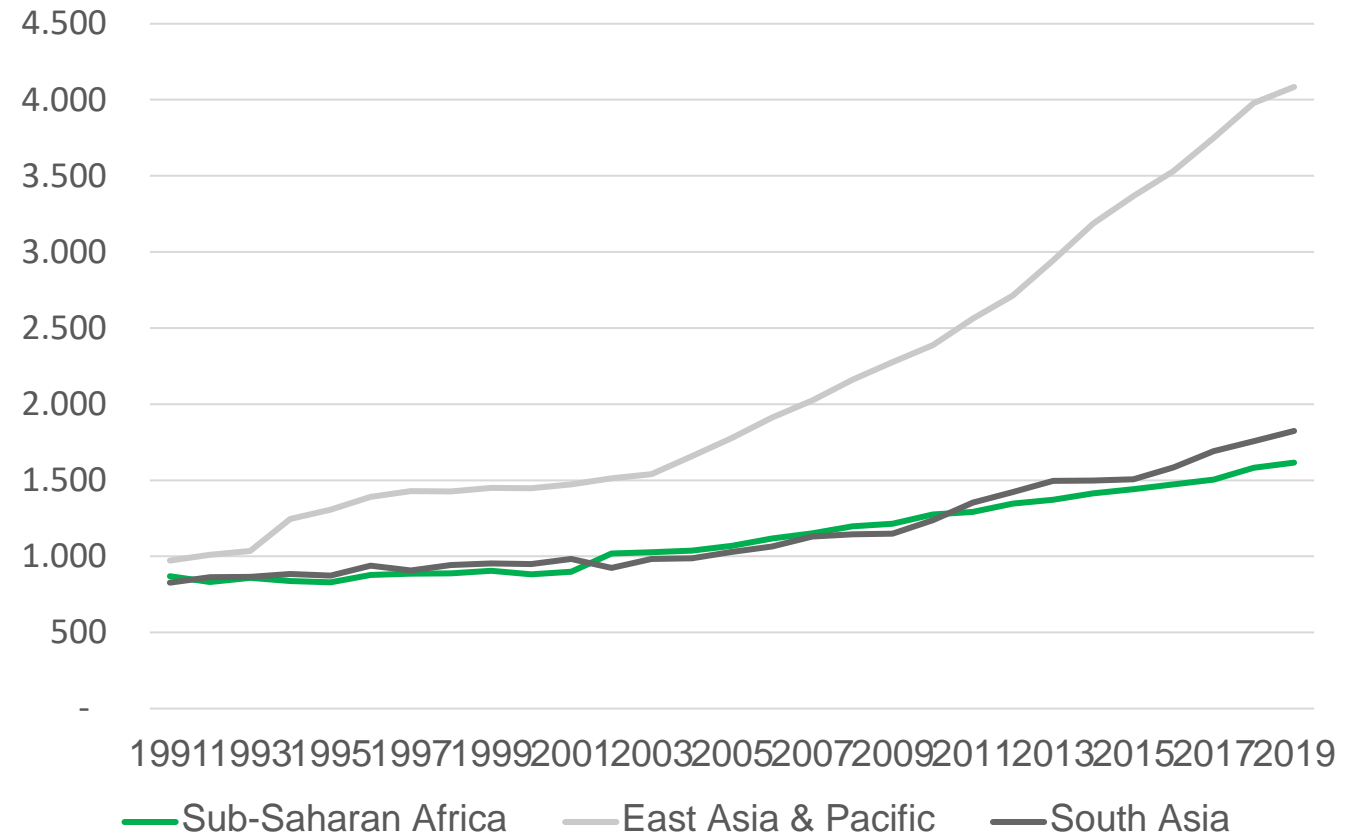
Labor productivity and marketed surplus

- East Asian countries (Korea and Japan) achieved rapid labor productivity growth in agriculture, generating a surplus of food above that consumed within the agricultural sector
- South Asian countries (India and Pakistan) recorded more vertical lines, increasing land productivity faster than labor productivity
- Slow growth of employment outside of agriculture: absence of “pull” factors
- Technological change biased to land productivity (seed, water, fertilizer) against labor productivity (mechanization).



Value added per agricultural worker per year (USD)

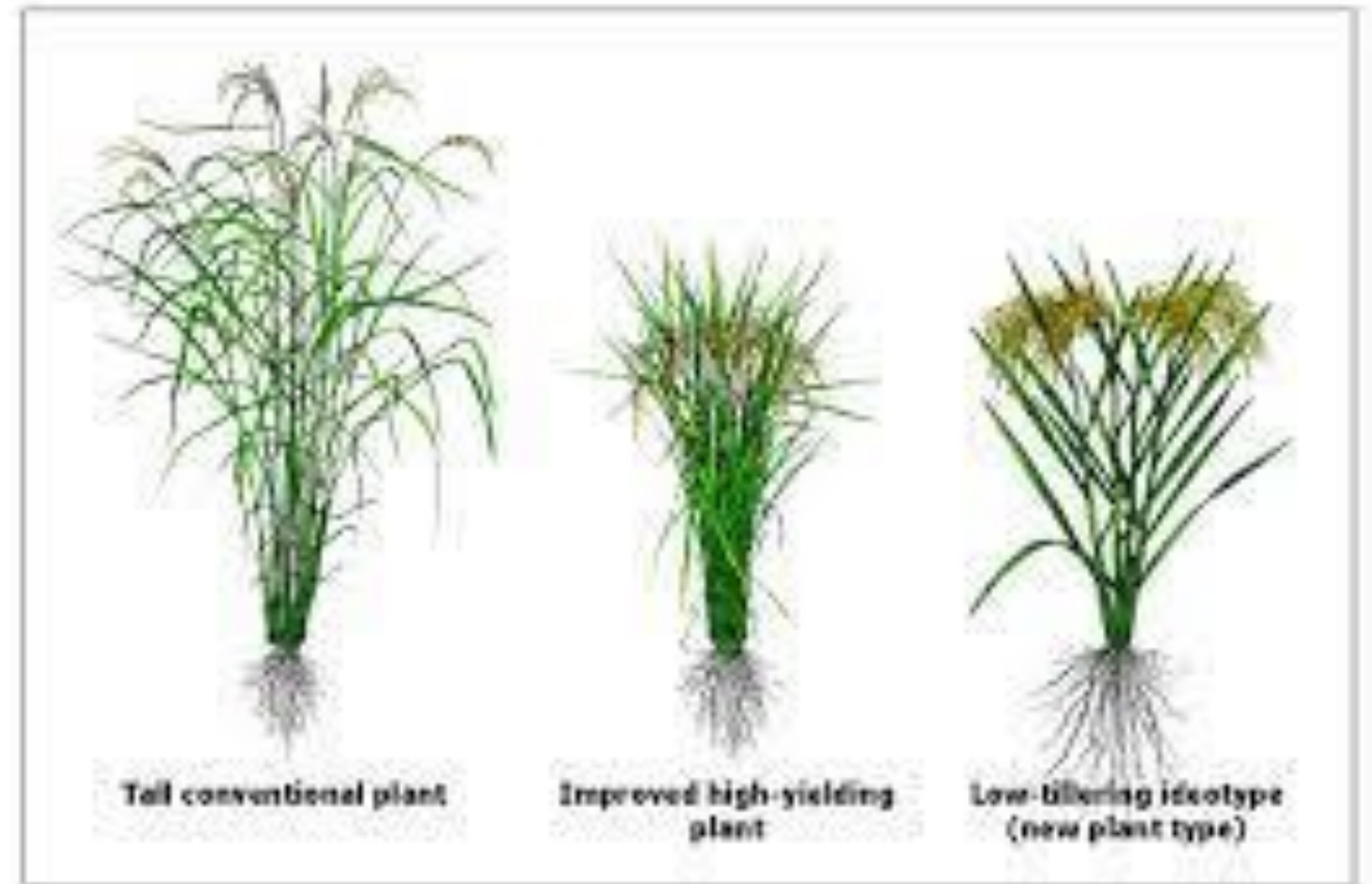
- Rapid rise in labor productivity in agriculture in East Asia, but not in Sub-Saharan Africa and South Asia
- Rising agricultural GDP even as agriculture's *share* in GDP falls
- Large marketed surplus for wage goods and exports





The green revolution in Asian rice agriculture

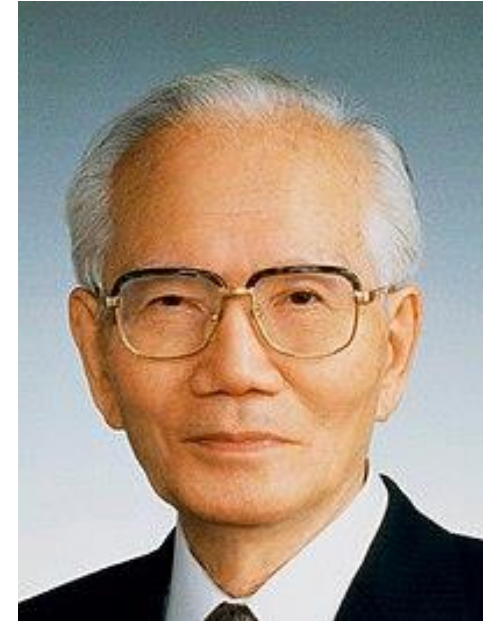
- Modern rice varieties (IR8): “semi-dwarf (short statured) plants.
- Sensitive to nitrogen fertilizer applications
- Shorter growing season (spend less time growing stalks) so farmers can plant two or even three crops per year
- But required timely and sufficient supplies of water





Shigeru Ishikawa, 1918-2014

- Author of *Economic Development in Asian Perspective*, 1967.
- Development is associated with the growth of the modern sector but this does not mean that capital should flow out of agriculture.
- In fact, the reverse was the case in 19th century Japan → taking into consideration all resources, net flows to agriculture were positive.
- *Water control* is the leading input in agricultural development.
- Without irrigation and flood control, use of improved seeds and fertilizers and multicropping are not possible.
- Land and labor productivity both dependent on investment in public works, especially irrigation and drainage.

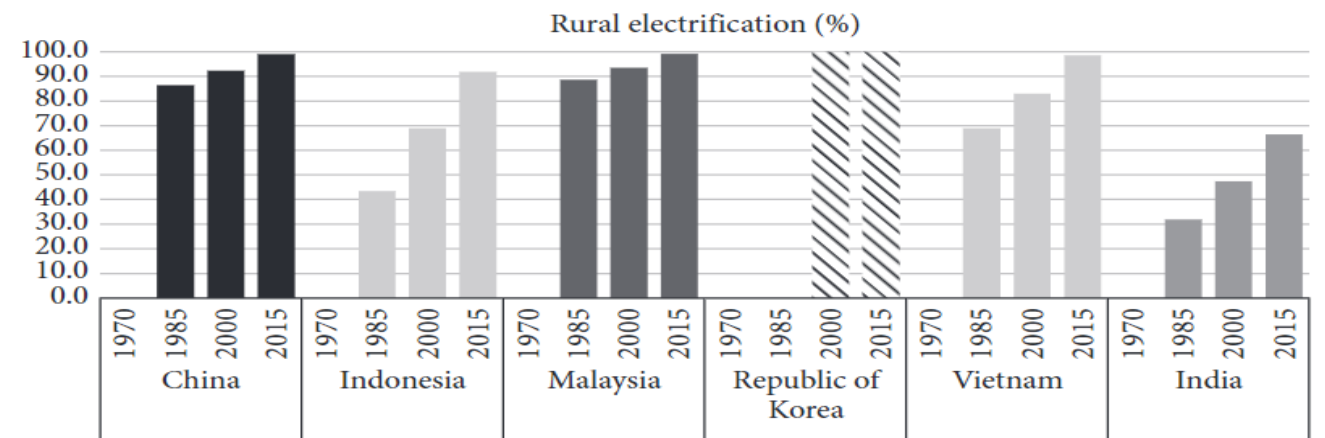
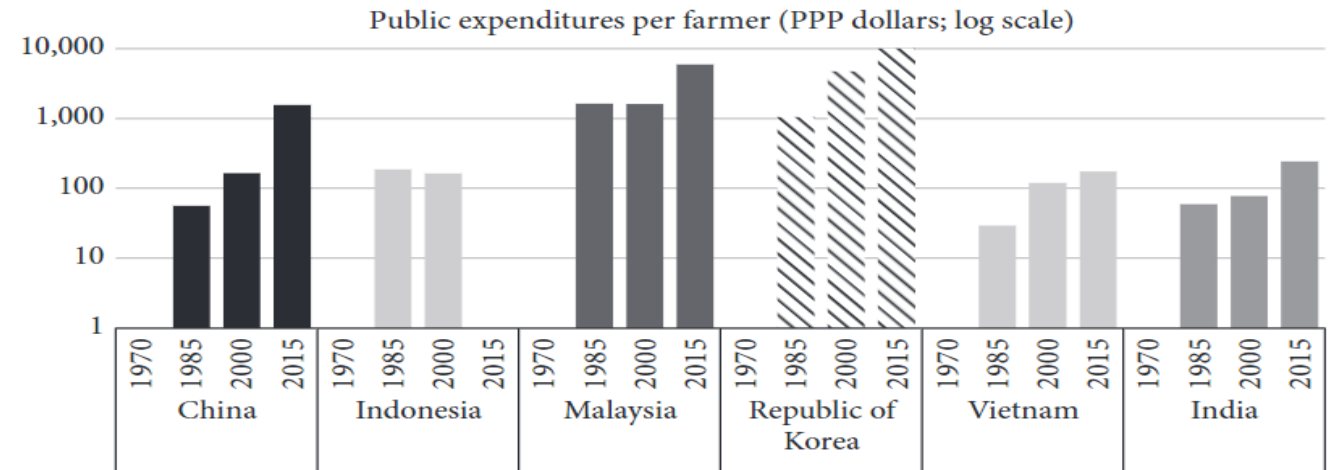


Shigeru Ishikawa



Public investment in agriculture

- Asian governments have invested in water control, roads, fertilizer production and agricultural research to accelerate agricultural growth.
- They continued to do so even as middle-income countries
- Vietnam did a good job building rural infrastructure (for example roads, electrification)



Differences between Southeast Asian and African development



Southeast Asia	Africa
Unlimited supplies of labor	Limited supplies of labor
Densely populated rural areas in rice-growing areas	Less densely populated rural areas: low productivity agriculture
Rapid growth of labor productivity in agriculture	Slow growth of labor productivity in Africa
Increase in marketed surplus of food and relaxation of wage goods constraint	Slow growth of food production
Stable real wages in the modern sector	Stable (but high) real wages in the modern sector
Rapid productivity growth in the modern sector	No productivity growth in the modern sector



High real wages in Africa

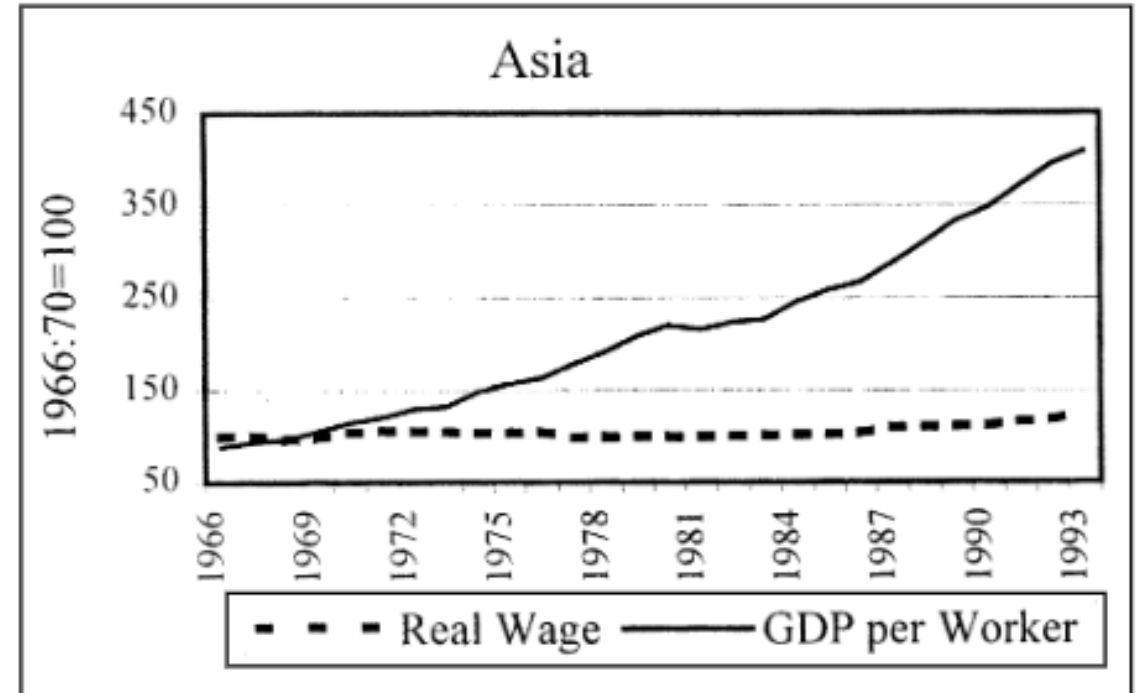
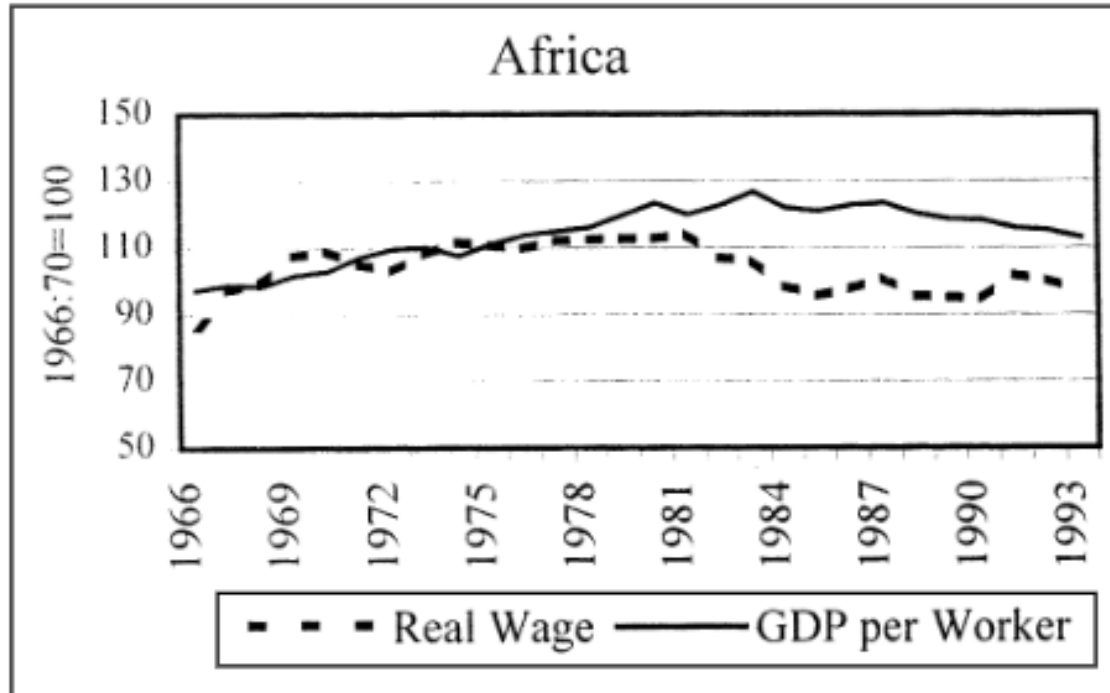
Table 7. *Manufacturing wages in sub-Saharan Africa and Asia, 1965–94*

	In US\$ at official exchange rates			Consumption wages at PPP Exchange rate ^a			Real wage index ^b		
	1965–70	1975–80	1985–90	1965–70	1975–80	1985–90	1965–70	1975–80	1985–90
<i>Median</i>									
Africa	700	2593	1692	180	330	508	98	100	88
Asia	402	741	1215	100	197	454	82	100	133
<i>Mean</i>									
Africa	861	2459	2506	162	349	494	109	100	85
Asia	433	901	2037	107	206	509	87	100	145
<i>t</i> -test for difference between the means	3.95	4.48	0.53	2.43	3.21	–0.13	1.60	—	–4.15

Source: Karshenas 2001



Productivity growth and steady real wages in Asia



Source: Karshenas 2001



Agriculture as a home market for industrial goods

- Sudipto Mundle: The size of the home market for industrial output (demand) depends on productivity growth in agriculture.
- Slow growth of agricultural productivity reduces demand for the output of the modern sector.
- If farmers keep the extra production that they create (Japan and English during industrialization) they have an incentive to invest in productivity-enhancing technology
- If someone else keeps the extra production (feudal landlords), then farmers do not have the means and the incentive to invest in productivity-enhancing technology (France during industrialization and India)



Policy implications

- Although the share of agriculture in GDP falls during the development process, development requires a sustained rise in labor productivity in agriculture.
- Failure to produce sufficient supplies of wage goods (or have the capacity to import them) leads to inflationary pressures that slow down or halt the development process.
- Achieving sustained labor productivity growth in agriculture requires public investment in irrigation, drainage, roads, electricity, research and removing institutional obstacles to change.
- Rural infrastructure creates off-farm jobs in rural areas that are important for income growth and poverty reduction



Discussion questions

- Why was the Green Revolution in rice so important to economic development in East Asian countries?
- What are the implications for Vietnam's economic development of rising seas level resulting from climate change?