

The Importance of Policy Incentives to Agricultural Productivity Growth A Synthesis

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Executive Summary

These notes synthesize evidence of the effects of policy incentives on agricultural productivity. The evidence discussed is primarily drawn from documents provided to EPAR by the Foundation, but is also drawn from additional sources as cited in footnotes.

The Role of Policy & Institutions in the Asian Green Revolution:

EIU's analysis of the growth boom periods of six Asian economies (China, Vietnam, South Korea, Taiwan, India and Indonesia) determined that policy and institutional reforms were by far the single most important source of both agricultural growth and poverty reduction. The study determined that across the six countries, the median share of agricultural growth effects attributable to policy and institutional reforms was 40%; the median share of poverty reduction effects across the six countries attributable to policy and institutional reforms was 30%. (p. 7).

- In China, policy reforms that liberalized markets, increased centrally-controlled grain prices, and granted control and income rights associated with agricultural lands to farmers (although land ownership remained collective) were estimated to account for \$2,830 billion in agricultural output growth (a 60% share of the total output growth), and to have lifted 77.7 million urban and rural Chinese out of poverty between 1978 and 1990. In particular, the introduction of the Household Registration System in 1979, which granted rights to farm individual parcels of land, and allowed farmers to sell surplus agricultural production, was estimated to be responsible for 42-46% of the total increase in agricultural output during the early reform period from 1978-1984. (EIU p. 23-26)
- In India, policy and institutional reforms, including policy changes which increased access to rural land, were estimated to be responsible for \$599 billion in agricultural output growth (a 15% share of total agricultural output growth) and to have lifted 4.4 million people out of poverty. (EIU, p. 29, 33-35)
- Ahmed 1996¹ reports that policy reforms in fertilizer and irrigation markets contributed 20% to 32% of the increase in rice production in Bangladesh, and concludes that "Bangladesh would have remained immersed in foodgrain shortages and higher food prices had there been no changes in the fiscally unsustainable public interventions in agricultural input markets." (817)

¹ Ahmed, Raisuddin (1996). "Agricultural Market Reforms in South Asia." *American Journal of Agricultural Economics*, 78, 2 pp. 815-819. (Cited in the EIU report)

NOTE: The findings and conclusions contained within this material are those of the authors and do not necessarily reflect positions or policies of the Bill & Melinda Gates Foundation.

- In Indonesia, policy and institutional reforms, including credit market reforms and government subsidy of fertilizers and pesticides, were estimated to be responsible for \$266 billion in agricultural output growth (an 18% share of total agricultural output growth) and to have lifted 9.6 million people out of poverty. (EIU, p. 39, 42-44)
- In South Korea, policy and institutional reforms, including investment in fertilizers, pesticide and other agricultural inputs, were estimated to be responsible for \$163 billion in agricultural output growth (a 39% share of total agricultural output growth), and to have lifted 1.3 million people out of poverty. (EIU, p. 48-50)
 - The UN FAO concluded “the government has served as a driving force for agricultural growth by expanding its investment and financing activities” in the Korean agricultural sector. (EIU p.52)
- In Taiwan, policy and institutional reforms, including the establishment of controls on rent charged to tenant farmers and the limitation of landholding size, were estimated to be responsible for \$31.85 billion in agricultural output growth (55% of total agricultural output growth), and to have reduced the number of Taiwanese in poverty by 500,000. (EIU p. 55, 58)
- In Vietnam, policy and institutional reforms, including trade liberalization, the removal of government-determined domestic food price controls and land reforms, were estimated to stimulate \$176 billion in agricultural output growth (40% of total agricultural output growth), and to have helped 5.8 million rural people out of poverty. (EIU p. 63)

Detailed Case Study on How Policy Changes Removed Smallholder Productivity Constraints and Led to Growth

- Pingali & Xuan² describe how Vietnam’s 1981 decision to switch from a collectivized system of agricultural production to a contract system that strengthened individual farmer production incentives had significant positive effects for national rice productivity (697). Other agricultural policy reforms with successful productivity growth results followed this initial farmer incentive restructuring (707). Employing a regression analysis, the authors estimated that farmer “collectivization accounted for a total productivity decline of around 48%” as compared to non-collectivized farmers (712).
- Que³ notes that the period of initial agricultural policy reform initiated in Vietnam in 1981 was the first period since the initial collectivization of agriculture in 1958 when food output increased at a higher rate than population growth (41).
- A UN FAO analysis⁴ of economic growth in Asia concluded that Vietnamese agricultural productivity gains were directly attributable to a series of policy changes: “People worked harder once they gained security of tenure and the right to make their own production and marketing decisions.”
- Glewwe et al.⁵ note that the economic growth stemming from the agricultural productivity increases in the 1980s subsequently stimulated a nationwide decline in the incidence of poverty, although the positive effects of this poverty reduction were more pronounced in urban Vietnam (773,775).

² Pingali, P. & Xuan, V. (1992). Vietnam: Decollectivization and Rice Productivity Growth.” *Economic Development and Cultural Change* 40, 4 pp. 697-718.

³ Que, T (1998). Economic Reforms and Their Impact on Agricultural Development in Vietnam. *ASEAN Economic Bulletin* 15,1, pp 30-46.

⁴ <http://www.fao.org/docrep/009/ag089e/AG089E09.htm#ch3.6>

⁵ Glewwe, P. Gragnolati, M, & Zaman, H. (2002). Who gained from Vietnam’s Boom in the 1990s? *Economic Development and Cultural Change* 50, 4, pp. 772-792.

Theory on the Connection of Policy Incentives to Productivity Growth:

- Using estimates based on agricultural practitioner surveys, Waddington et al. analyze the percentage of yield gaps attributable to a variety of production constraints for major crops in South Asia and Sub-Saharan Africa. In many instances, socio-economic and agricultural management regimes were as important a constraint to agricultural productivity growth as biotic or environmental stresses. For example, in Sub Saharan Africa, they cited “difficult formal market access for grain” as the largest productivity constraint for sorghum and millet, and estimated that this constraint was responsible for 13% of the yield gap for the two crops. (40)
- Anderson describes how policy incentives (in both developed and developing countries) can directly and indirectly distort international markets for agricultural products. Direct market distortions for agricultural products may be caused by import and export subsidies and tariffs, production subsidies or taxes, monetary policies that distort agricultural product prices by altering foreign currency exchange rates, and by taxing or subsidizing farm production inputs. (23-26) Agricultural production has also been shown to be indirectly suppressed by manufacturing-protectionist policies, which divert resources from the agricultural to the manufacturing sector, and through over-valued exchange rates, which divert resources to economic sectors that are not directly affected by the trade-suppressing policy. (31) Anderson estimated that 80 to 90 percent of the “nominal rate of assistance” (the level of support or assistance received by domestic agriculture from national government policies and incentives) is attributable to import tariffs, export taxes, and other border measures, implying that border measures are relatively more important in determining domestic agricultural production levels than are direct agricultural product subsidies or taxes. (35)
- MAFAP: Agricultural production is influenced by incentives and disincentives “from the combined incidence of policy instruments impinging on food and agriculture ...[including] macroeconomic, trade, all sectoral (agriculture, fisheries, forestry, environment, industry, etc.), land, research and development and labour policies, as well as other support and services provided by the state.” (17)
 - MAFAP reviewed quantitative analyses of policy-determined incentives and disincentives in agricultural production in both industrialized and African countries. MAFAP notes that these analyses vary in focus, and include focuses on land, infrastructure, education, and macroeconomic policies, in addition to direct agricultural policies, concluding that “incentives and disincentives to agricultural production result from policies and from factors that are not necessarily directly related to policies.” (68)
 - Direct government interventions in the form of public expenditures in the agricultural sector also affect agricultural production levels by affecting consumers, producers and other agents in the agricultural production chain, and also by funding research, training, infrastructure and supporting markets. (72)
- Ahmed 1996⁶ notes that “measuring the impact of policy reforms is quite complex because of problems in deriving the counterfactual estimates of production and income without reform necessary for comparison with the outcome of reform (817).

⁶ Ahmed, Raisuddin (1996). “Agricultural Market Reforms in South Asia.” *American Journal of Agricultural Economics*, 78, 2 pp. 815-819. (Cited in the EIU document)