

Public Investment in Agriculture

Policy Issues in South Asia



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Investment in public goods delivery is necessary to safeguard farmers from climate change vagaries and other shocks.

The South Asian economy suffers from huge structural problems. A large portion of the working population, mainly women, is involved in agriculture that is not very productive, while only a small section is engaged in secondary and tertiary sectors of the economy. There is a huge income and living standards gap between those working in agriculture and other sectors of the economy. Low returns from agriculture discourage the private sector from investing in agriculture. The hesitation in private investment in agriculture's capital formation is mainly due to limited availability of public goods, particularly physical infrastructure. Identification of policy measures for public investment in agriculture is necessary for food security and livelihood in South Asian countries. Investment in capital formation influences the pace and pattern of agricultural development, food security and livelihood of the farming communities, particularly women.



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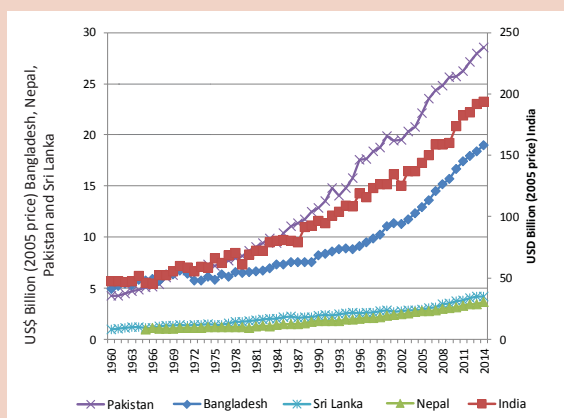
Value added in agriculture

Public investment in different productive sectors of the economy is guided by value addition in the sector. Among South Asian countries, the annual agriculture value added is the highest in India (USD 194 billion) followed by Pakistan (USD 29 billion), Bangladesh (USD 19 billion) and Sri Lanka and Nepal (USD 4 billion each) (Figure 1). Agriculture is not growing at the same pace in south Asian countries. The sector's growth is much faster in Pakistan, India and Bangladesh than in Sri Lanka and Nepal. The low rate of growth in the latter countries is largely attributed to limited public investment and capital formation. Infrastructures like irrigation and roads in these countries are inadequate because of limited public investment and geographic adversities.

Labour productivity in agriculture is important for alleviating poverty and attracting the labour force to the sector. In South Asia, the agriculture value added per worker is the highest in Pakistan (USD 1083) followed by Sri Lanka (USD 1046). India (USD 689) and Bangladesh (USD 602) stand neck-to-neck. Nepal has the lowest value added per worker (USD 271).

Adoption of the green revolution technology (high yielding varieties, chemical fertilizers, irrigation and pesticides) is seen to increase labour productivity in South Asia. Pakistan made gains in labour productivity during the eighties and nineties, whereas Sri Lanka and Bangladesh gained in the last decade (Figure 2). Pakistan boosted its public investment in capital formation, particularly in construction of large water reservoirs during the early seventies, and adoption of the green revolution technology. These increased its land and labour productivity. In Sri Lanka, its agricultural policy favoured replacing small-scale family farms with large estates of tea, rubber and coconut. Sri Lankan food crops got commercialised after adopting green revolution technologies thus helping the country achieve substantial productivity gains. Bangladesh achieved significant progress in food grain production, particularly *boro* rice cultivation, using the green revolution technology. India also benefitted from the technology, but labour productivity grew only slowly. This slow productivity growth came about due to a slow pace of spread of the technology to many parts of the country, except those in the Indo-Gangetic plains. Nepal could not benefit much from the technology except in some parts of the Tarai.

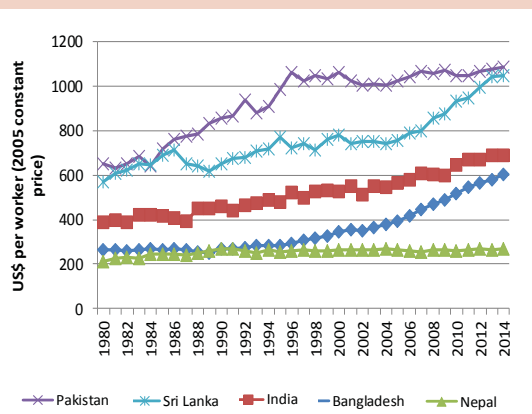
Figure 1 Agriculture value addition in South Asian countries



Source: The World Bank 2015

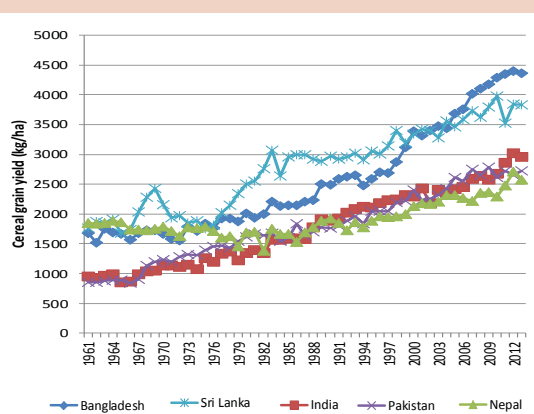
Agricultural productivity is important for food security. Rice is the staple crop in Bangladesh, Nepal and Sri Lanka just like wheat in Pakistan and India. In 2013, South Asian cereal grain yield was the highest in Bangladesh (4,357 kg/ha) followed by Sri Lanka (3,833 kg/ha) and India (2,962 kg/ha). The yields in Pakistan (2,722 kg/ha) and Nepal (2,570 ha) were low. The rise in Bangladeshi yield rate can be attributed to the adoption of the green revolution technology in *Boro* rice, particularly after 1992. Sri Lanka achieved its yield increase particularly during the eighties. The cereal yields in India and Pakistan are growing continually, whereas in Nepal it started increasing only after 1992 albeit at a slow pace (Figure 3). These increases came about due to public investment in green revolution technology adoption, particularly

Figure 2 Agriculture value added per worker in South Asian countries



Source: The World Bank 2015

Figure 3 Cereal grain yield in South Asian countries



Source: The World Bank 2015

high yielding varieties, irrigation and chemical fertilizers. Cereal yield suffered in Nepal due to limited investment there.

Hunger and food insecurity in South Asia

An increase in food production in South Asia is not enough to reduce undernourishment and hunger. The proportion of undernourished South Asian population is still large. Sri Lanka has the highest proportion of undernourished population followed by Pakistan and India (Table 1). Bangladesh and Pakistan share the highest global hunger index securing 57th position worldwide. Sri Lanka records the best global food security index followed by India. Public investment is still not commensurate with the need to reduce malnutrition and hunger.

Challenge of climate change adaptation

As if this was not enough, the demand for an increase in public investment is also called for by the need to face the challenges brought about by climate change. Food production is affected by the increased frequency and intensity of climatic variations such as drought,

floods, tropical cyclones, heavy precipitation events, hot extremes and heat waves. The International Panel on Climate Change projects an increased incidence of extreme weather events for the South Asian region that may include heat waves and intense precipitation.

Food insecurity and climate change must be addressed through investment in agricultural adaptation. This is the only response strategy to overcome the impacts of observed and projected climatic changes. Though adaptation efforts are being made, they are still at the initial phases. Inadequate funding still haunts those measures. Capital formation through investments in irrigation canals and tanks can help safeguard farmers from the vagaries of climate change to a great extent.

Private investment in agriculture

Both public and private investments are necessary to increase production and improve food security. Private investment is necessary in agricultural production, marketing, value addition and trade. But the caveat is that private investment is limited by poor public investment. And, private investment may come either from households or the corporate sector. Household

Table 1 Indicators of hunger and food insecurity

Country	Undernourished population (%)	Underweight below 5 years (%)	Under 5 mortality rate (%)	Global Hunger Index 2014		Global food security index 2015	
				Score	Rank	Score	Rank
Bangladesh	16.3	36.8	4.1	19.1	57	37.4	89
India	17.0	30.7	5.6	17.8	55	50.9	68
Nepal	16.0	29.1	4.2	16.4	44	40.5	85
Pakistan	17.2	31.6	8.6	19.1	57	45.7	77
Sri Lanka	22.8	21.6	1.0	15.1	39	53.7	63

Sources: International Food Policy Research Institute (2014)¹, Economist Intelligence Unit (2015)²

sector investment comprises investments in farm equipment, machinery, irrigation, land improvement and land reclamation. Such investment comes from farmers that depend on micro-financing and corporate sector investment. Corporate sector investment, on the other hand, depends on bank loans and includes investment by organised corporate bodies, like big private companies in India, and unorganised entities, like sugar cooperatives and milk cooperatives in different South Asian countries. Agricultural credit helps farmers to invest in machines, such as tractors and tube wells, to enhance their farm production and income. Public goods can create a favourable environment for private investment. Examples of public goods affecting public investment in agriculture are research and technology development, variety and breed development, supply of mother stocks and foundation seeds, development of irrigation, development of markets for agricultural inputs- such as seeds, fertilizers and tools, technology and farm produce and connections through roads, electricity, phones and the internet and insurance..

Public investment in agriculture

Budgetary outlays have been increasing in agriculture, forestry and fisheries in South Asian countries (Table 2). Just over one decade, the regions witnessed markable increase in agricultural budgetary allocation in just a decade- nearly five times in India and seven times in Pakistan. Other countries had a less spectacular increase in their agricultural budget.

The proportion of agricultural budget, in the total budget, ranges from one to 15percent in South Asian countries- the lowest in Pakistan and the highest in Nepal (Figure 4). The share of the agricultural budget was increasing in all South Asian countries till 2008, but decreasing thereafter, except Nepal.

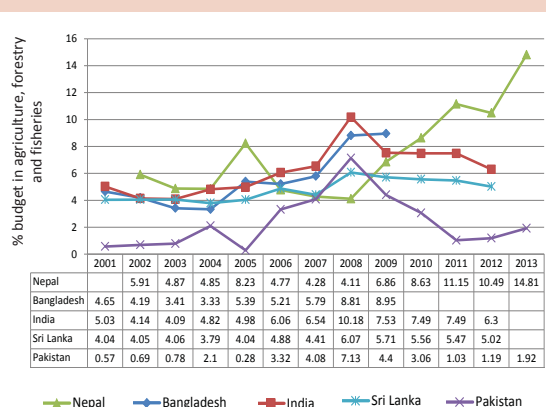
	2001	2005	2010	2012
Bangladesh	238	369		
India	3862	6412	20881	19271
Nepal		102	274	363
Pakistan	68	51	1049	487
Sri Lanka	168	234	610	602

Data source: FAOSTAT

Though public investment in agriculture has been increasing, a larger part of it is recurrent expenditure and not capital expenditure. The recurrent expenditure is increasing at a much faster rate than its capital counterpart. Since capital formation is needed to change the agricultural scenario, this is not a healthy sign. Capital formation, in the form of infrastructure, improvement in quality of natural resources and assets and creation of productive assets, is necessary for agricultural development. Capital formation supports the overall development process by improving the stock of equipment and tools and productivity of the resources employed. Gross fixed capital (GFC) formation in agriculture per hectare of land varies between USD 2,000 to 7,000 in South Asia, the highest being in Bangladesh followed by Pakistan, and both are on the increase (Figure 5). GFC formation is increasing in Bangladesh and Pakistan and decreasing in Sri Lanka in recent decades. The per hectare GFC is much lower in India and Nepal.

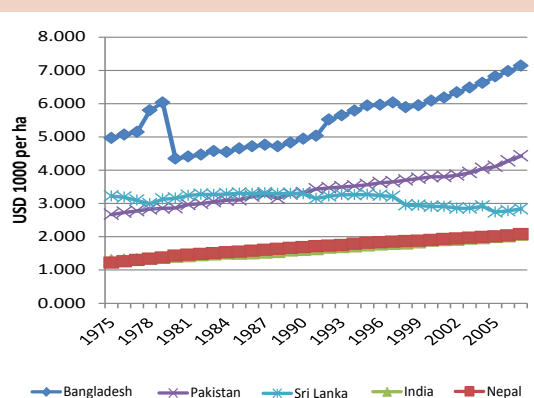
It is widely recognised that women are shaping the rural economy in developing countries. They make their contributions as farmers, labourers and entrepreneurs³. While women make up the majority of farm producers, they are often concentrated in the less profitable stages of the value chain⁴. They

Figure 4 Percent of total budget in agriculture, forestry and fisheries



Source: FAOSTAT

Figure 5 Gross fixed capital formation per hectare



Source World Bank and FAOSTAT



play a larger role in global food production and preparation than men. Women produce half of the world's food and their contribution goes up to 60 to 80 percent in most of the developing countries⁵. Their role in livestock and poultry management is greater than that of men⁶. Though women's participation is emphasized in most of the development programmes, public sector investments are not explicitly classified to show whether they are pro-women or not. Public investment in agriculture is needed for the food security of a nation, livelihood of the farmers, adaptation to climate change and to address gender issues.

Way forward

Here, some policy measures are identified to help incumbent governments to utilize the available financial resources for the development of agriculture. Agriculture is increasingly calling for greater public sector investment, particularly for capital formation. To raise the pace of capital formation in agriculture and accelerate its growth, the following changes are recommended in the budgeting strategy of South Asian countries.

- The governments should include a better targeting and downsizing subsidies on running costs while increasing capital costs. Reduction in recurrent expenditures and increment in investment in physical infrastructure are advisable. The major areas for public investment should include production of public goods that have a direct bearing on farm productivity, such as irrigation, power, road and market structures. An increment in investment is also needed in research and

development, technological inventions, technology transfer and inter-sectoral linkages. For those areas in South Asia, such as hills and mountains of India, Nepal and Pakistan, that could not benefit well from the green revolution technology, policy measures are necessary to develop suitable technologies.

- To sustain agriculture production, several problems related with backward and forward linkages need to be addressed. The backward linkages are marred by bottlenecks in the supply of improved seeds and fertilizers, limited irrigation facilities and unavailability of suitable machines and tools for rural smallholder farmers. The hurdles in forward linkages include inadequate marketing infrastructures and inadequate private investment in suitable transport, storage and processing of agricultural products. Public investment in infrastructures attracts private investment in agriculture.
- An increment in the agricultural budget is also needed to rectify the structural dislocations of the economy. An enhancement of overall agricultural production and productivity will bring about positive changes in the livelihood of the majority of the agricultural communities. Support to the agriculture sector, particularly smallholder farmers, is helpful in improving food security conditions in the region. For adaptation to climate change and reducing vulnerabilities, investment is required for the development of stress tolerant crop varieties and breeds, irrigation infrastructure and suitable farming technology. Bangladesh and adjoining parts of India need investment to save farmland and other assets from sea level rises and cyclones.



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Public investment to create off-farm employment opportunities in the village, particularly in Bangladesh and Nepal, can retain farmers in rural areas by providing them with alternative sources of income when their farming gets affected by climate change.

- Regional policy measures are advisable to compensate farmers for the losses incurred due to climate change. Public sector investment in the delivery of public goods is necessary to safeguard farmers from the vagaries of climate change and other shocks, such as price drops or import surges. Regional agricultural research programmes are another step forward in developing and sharing technologies for climate change adaptation. The multi-functional aspects of agriculture can be awarded in terms of payments in the course of generating public goods such as aesthetics and cultural values.
- Investment is also necessary to enhance research and development efforts to mitigate inefficiencies of the agricultural markets. A collaborative approach of South Asian countries is imperative in developing linkages among regional markets for greater agricultural yields. Public investment ought to be increased for developing market linkages of backward regions, which have a high potential for agricultural growth and greater scope for livelihood improvement, with the cities.
- Countries facing heavy rural labour out migration flow, such as Bangladesh and Nepal, can mobilize

the remittances to develop their agriculture through an improved investment policy. A clear political commitment can reassure the safety of such investment.

- The countries in the region ought to develop systems for exchange of scientists and trainers to foster their research base and enhance the capacity of their farmers and entrepreneurs to access agricultural technologies. The role of development partners is particularly important in the transfer of agricultural technology that is protected by intellectual property rights. ■

Notes

- ¹ International Food Policy Research Institute (2014) Sri Lanka
- ² Economist Intelligence Unit (2015) Sri Lanka
- ³ Fontana, M. (2003). The Gender Effects of Trade Liberalization in Developing Countries: a review of the literature. Discussion papers in Economics. Department of Economics, University of Sussex. Brighton.
- ⁴ Elbehri, A. and Lee, M. (2011). The Role of Women Producer Organizations in Agriculture Value Chains. Practical lessons from Africa and India. Food and Agriculture Organization of the United Nations, Rome.
- ⁵ Mehra, R. and M.H. Rojas (2008). A Significant Shift: Women, Food Security and Agriculture in a Global Marketplace, International Center for Research on Women (ICWR), p.2. Citing FAO Focus on Women and Food Security. FAO. (available at www.fao.org/focus/e/women/sustin-e.htm).
- ⁶ Tangka F.K., Jabbar M.A. and Shapiro B.I. (2000). Gender Roles and Child Nutrition in Livestock Production Systems in Developing Countries: A critical review. Socio-economics and Policy Research Working Paper 27. ILRI (International Livestock Research Institute), Nairobi, Kenya.

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