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INDIAN AGRICULTURE

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Ashok Gulati and Surbhi Jain

Developing Countries, Agriculture and the World Trade Organization
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Joint Director (Production) : V.K. Meena
Cover Design : Gajanan P. Dhope
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Let noble thoughts come to us from all sides
Rig Veda

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YE-35/2014



Mazdoor, Kisan and Malik

The agricultural sector in India is a sight of struggle at many levels. On the theoretical plane, the debate about the role of agriculture in the economic development of the country, its relative importance vis a vis the industry and services sector, modes of financing agricultural development, the changing nature of agrarian relations and associated political questions give rise to sharply polarised positions across the academic spectrum. At the same time, the practical problems like the relative backwardness and lack of basic amenities of health and education in rural areas, migration from agricultural activities to cities etc. also pose a challenge to policy makers and planners.

There is no doubt that the agricultural sector is a critical factor in determining the welfare of the people in the country as a whole. After all, almost half of the total employment in the economy is generated in agricultural sector providing sustenance and livelihood to more than 70 per cent of the people living in the rural area as per the Census 2011 figures. It is a noticeable fact that the share of agriculture in the GDP has shown a marked decline from 51.9 per cent in 1950-51 to 13.7 per cent in 2012-13. Clearly, it leads to 'asymmetry in income and employment' which generates a skewed distribution of income between agricultural and non-agricultural sectors and also between rural and urban areas. These trends require a close analysis to understand the forces at work in the agricultural sector and the dynamics of change therein to gain a foresight into the future of this sector and to formulate the policy roadmap.

Indeed agriculture is a vital component of the strategy for the reduction of poverty since the growth originating in agriculture is known to be twice as effective in reducing poverty compared to the growth originating outside of the agriculture. But India's record of growth in the agricultural sector leaves much scope for better performance. There is no doubt that the growth rate of agriculture has shown an upward trend from 2.15 per cent in the period 1951-52 -1965-66 to 3.89 per cent for the period 2005-06 to 2011-12, yet it has not been able to keep pace with the growth rate of other sectors of the economy over the same period. One major reason for the slowdown in the agricultural sector is a sharp decline in (non-subsidy) public investment and input usage in agriculture which has adversely impacted the profitability of crops. The decline in public investment in agriculture has been attributed to the expanding subsidies on agriculture. However, this trend has been reversed to some extent since the 9th Five Year plan. The Gross Capital Formation in agricultural sector has gone up from 13.9 per cent during the 10th Plan period to 19 per cent during the 11th plan period. This in part explains the improved agricultural performance over this period.

The challenge of ensuring a vibrant and dynamic agricultural sector capable of sustaining the economic growth in other sectors requires a deeper engagement with the agrarian issue going beyond the economic aspects. There remain many issues concerning agriculture on which debate is still continuing. It is not clear if the future of agriculture lies in moving towards corporate farming or the 'land to the tiller' model. Similarly, the fragmentation of the land holding may have somewhat altered the contours of the conflict in the arena of agriculture but agrarian relations continue to have significant political implications. Understanding the organic linkage of agriculture to the socio-cultural reality of the rural area can provide us insight into the root cause of conflict and social unrest that haunts many parts of India today. Daniel Thorner's classification of the rural population into *mazdoor*, *kisan* and *malik* may have lost some of its analytical edge so far as the economic understanding of the agricultural sector is concerned but it still retains its utility if we want to understand the issue in a holistic framework. □



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YE-34/2014

Investing to Propel Growth in Indian Agriculture

Ashok Gulati
Surbhi Jain



What growth rate is needed in agriculture, and what is plausible, to make sure that poverty banishes as fast as possible in India? Our take is that Indian agriculture has the potential to grow at 5 per cent per annum for the next ten years, if one were ready to take bold policy decisions, and thereby contribute its most important role in alleviating poverty, hunger and malnutrition

PROPELLING GROWTH in agriculture is critical as research has revealed that GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP growth originating outside agriculture (World Development Report, 2008). In that sense alone, true inclusiveness of Indian growth model can come true only when agriculture does better than what it has done in the past. This will override all models that try to achieve inclusiveness through special concessions to a particular community, caste, or class. What growth rate is needed in agriculture, and what is plausible, to make sure that poverty banishes as fast as possible in India? Our take is that Indian agriculture has the potential to grow at 5 per cent per annum for the next ten years, if one were ready to take bold policy decisions, and thereby contribute its most important role in alleviating poverty, hunger and malnutrition.

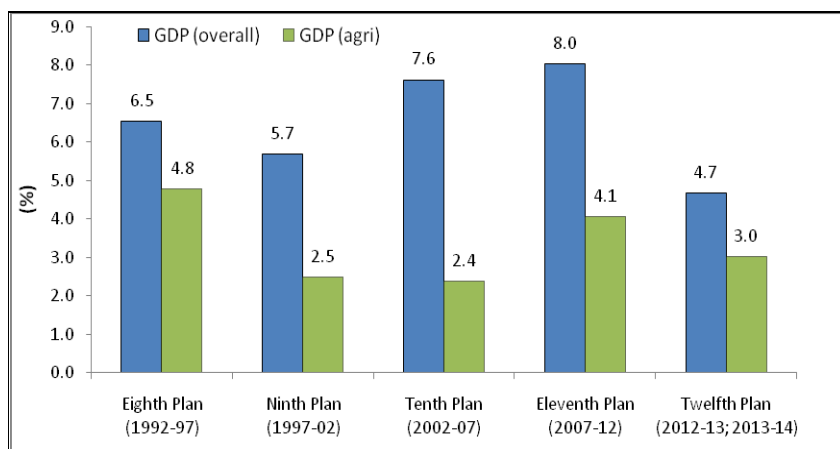
Agri-growth Performance since Economic Reforms of 1991

The average annual rate of growth in agriculture & allied sector during the entire period (1991-92 to 2013-14) comes at 3.2 per cent – much lower than the 4.0 per cent targeted

in the recent Plan periods. But it has fluctuated widely during various Plan periods (Figure 1). It witnessed a growth rate of 4.8 per cent during the Eighth Plan period (1992–97), but thereafter, it saw a downturn towards the beginning of the Ninth Plan period (1997–2002) and the Tenth Plan period (2002–07), when the agricultural growth rate came down to 2.5 per cent and 2.4 per cent respectively. During the Eleventh Plan (2007–12), agri-GDP growth bounced to 4.1 per cent, but then again fell to 3.0 per cent in the first two years of the Twelfth Plan (2012–17). On a decadal basis, agri-GDP rate accelerated from an average annual rate of 2.9 per cent during the 1990s (1991-92 to 2000-01) to 3.4 per cent during the 2000s (2001-02 to 2013-14), with an overall growth for the entire period being 3.2 per cent. A significant note here is that the coefficient of variation (CV), as a measure of volatility, for growth in agri-GDP is almost four times than the CV observed in overall GDP growth during this period. This calls for enhanced investments in irrigation and agri-R&D to not only increase productivity of agriculture but also its stability. Have we invested enough in these areas? Not really. For example, at the beginning of the Twelfth Plan, there were 337 major and medium irrigation projects

Ashok Gulati is Chair Professor-Agriculture in The Indian Council for Research on International Economic Relations (ICRIER). An eminent agricultural economist, he was the Chairman, Commission for Agricultural Costs & Prices, Govt. of India. Earlier, he was the Director in Asia for the International Food Policy Research Institute (IFPRI). He had also served as a member of the Economic Advisory Council of the Prime Minister of India. Surbhi Jain is Director, Commission for Agricultural Costs & Prices.

Figure 1: Comparative Growth in GDP (overall) and GDP (agri) during Plan Periods



Source: Central Statistics Office (CSO). All figures are at 2004-05 prices. The figures for 2012-13 and 2013-14 are as per the Advance Estimates of CSO released on 7th February, 2014

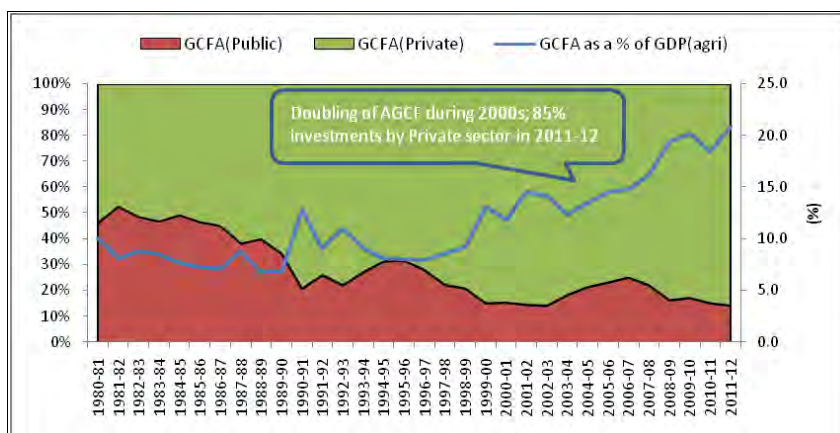
requiring an indicative budget of more than Rs 4,22,012 crore. Against this need, the annual allocation for irrigation is less than Rs 20,000 crore. This speaks of the neglect of investing in development of water resources and its proper management.

Growth and Investment in Agriculture

Generally, the growth of a sector depends upon the investments made in that sector, its incremental capital-output ratio (ICOR) and the efficiency of capital in that sector, *a la* Harrod-Domar model. Therefore, the key driver of agri-growth is Gross Capital

Formation in agriculture (AGCF), which is actually investment in agriculture, from both the public and private sectors, as a percentage to agri-GDP. With an assumed ICOR in agriculture at 4:1, to get four per cent growth in agriculture, investment should be around 16 per cent of agri-GDP. During much of the period from 1990-91 onwards till 2007-08, AGCF at all India level was always below this threshold. No wonder then that the average annual rate of agri-GDP hovered around 2-3 per cent. From Ninth Plan (1997-2002) onwards, a reversal in trend has been achieved resulting in increase in this ratio to

Figure 2: AGCF as a Ratio of GDP (agri)



Source: National Accounts Statistics, CSO; Agricultural Statistics at a Glance, various issues

Note: All Estimates are at 2004-05 prices

13.9 per cent during the Tenth Plan (2002-07) and further to 19.0 per cent during the Eleventh Plan. Thus, as per percentage of agri-GDP, AGCF has more than doubled during the last decade (Figure 2). This is perhaps the biggest change that has occurred in Indian agriculture, and if sustained, will bring rich dividends in due course.

It is interesting to note here that the public sector accounts for only 20 per cent of the total investment in agricultural sector in India; 80 per cent comes from the private sector. In the early 1980s, the shares of the public and private sectors (including household sector) in AGCF were roughly equal, but by the early 2000s, the share of the private sector was four times larger than the share of the public sector. The private sector investment is complementary to public investment in agriculture but responds much better and faster to the incentive structures in agriculture. This indicates that improved incentives in the form of better returns or better prices have played a catalytic role in accelerating agricultural growth during the latter half of the 2000s decade.

It may be noted here that public investment in agriculture in India as measured by National Accounts Statistics (NAS) comprises largely of major and medium irrigation projects. The expenditures on R&D, rural infrastructure, rural electrification, education etc are accounted under other heads of investment expenditures. The estimate of public investment in agriculture used here is as reported by NAS, and therefore somewhat underestimates the public investments that are critical to propel growth in agriculture. If we account for these, then AGCF would easily cross much above 20 per cent of agri- GDP. With an ICOR of 4:1, this should then comfortably give us 5 per cent growth in the agricultural sector. But the agricultural sector is still having an average of 3-4 per cent growth.

What are the constraining factors to agricultural growth if investments

are not deficient? Should the overall resources going to agriculture be increased or is it that the composition of those resources needs correction? Or is it that the ICOR itself has changed to say 4.5:1 or even 5:1, with emerging labor scarcity? Or that this sector suffers from demand constraint? Or are there any other structural problems that need overhaul to allow this sector to grow sustainably at more than 5 per cent per annum? Could these be on the marketing side, asking for building up of efficient value chains from farm to processor to organized retailers? These are some of the questions that need a deeper probe. Here we look at only the nature and magnitude of public expenditure on agriculture and how that can be rationalized to propel growth in agri-GDP.

Public Expenditure on Agriculture

The total public expenditure on agriculture (including public investment & input subsidies) as a ratio of GDP (agri) has almost doubled in the last decade from 8.6 per cent in 1993-94 to 20.6 per cent in 2009-10. This compares well with international trends and may be towards a higher side. Thus, it appears that there are sufficient public resources going to agriculture. But the bane lies in the composition of that expenditure - Indian agriculture receives public resources more in

the form of subsidies than public investments. Almost 80 per cent is in the form of subsidies and only 20 per cent is investment in agriculture (Figure 3).

Subsidies

The three major input subsidies are (a) *fertilizer subsidy* that involves provision at retail prices lower than the cost of producing or importing fertilizers, (b) *irrigation subsidy* given by charging user charges below the expenditure on the operation and maintenance of surface irrigation; and (c) *power subsidy* through user charges that are lower than the cost of supplying power. Other subsidies may be in the form of *credit subsidy* through an interest subsidy on credit obtained from financial institutions and through outright waiver of loans; subsidy on crop insurance and subsidized sales of seeds. A major proportion of these subsidies is accounted by fertilizer subsidy which has shown an increasing trend in recent years. Fertilizer subsidy has increased by around five times in the last ten years from Rs 12,595 crore in 2001-02 to Rs 67,971 crore in 2013-14 (RE) at current prices. However, as a ratio of GDP (agri) it has increased from 2.6 per cent to 3.5 per cent during the same period. Additionally, there has been a hidden element of carryover of liabilities in these estimates to the tune of more than Rs 30,000 crore in 2013-

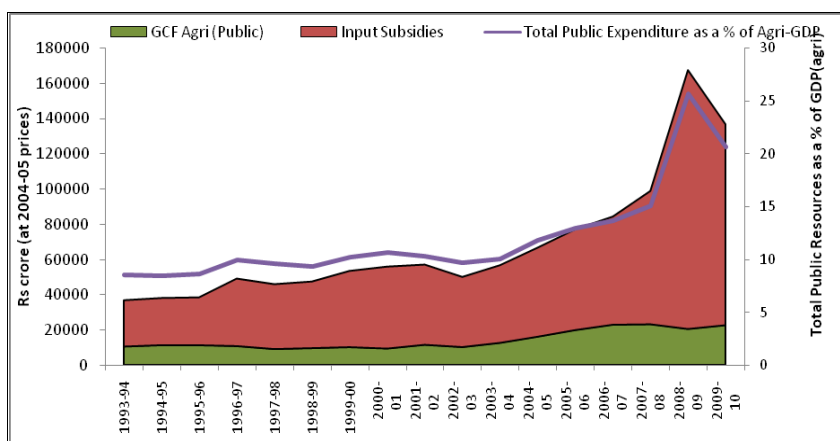
14 as per the Fertilizer Association of India. Increase in the fertilizer subsidy has been due to increased consumption of fertilizers which has been largely met through imports, sharp increase in prices of finished fertilizers & their inputs in the international market but stable domestic farm gate fertilizer prices (especially in the case of urea). There are clear indications that this subsidy has led to imbalanced use of N, P and K in states like Punjab and Haryana which has deteriorated soil conditions and raised questions on the environmental sustainability.

In addition to the input subsidies, food subsidy is provided for making food (mainly wheat & rice) available at affordable prices to a large section of the population. It represents the basic direct cost incurred by the central government on procurement, stocking and supplying to various food based safety nets of PDS and other welfare schemes. During the last few years, food subsidy has increased by more than ten times from Rs 17,494 crore in 2001-02 to Rs 92,000 crore in 2013-14 (RE) at current prices. This is expected to increase further with the extension of National Food Security Act, 2013. Together, food and fertilizer subsidies, accounted for an expenditure of more than Rs 1.5 lakh crore in 2013-14. In comparison, public investment in agriculture was around Rs 22, 000 crore -only one-fourth of this. This is reflective of the imbalance between use of subsidies & investments as policy instruments for agricultural growth and poverty alleviation. This needs to be urgently corrected especially when the marginal returns from expenditure on subsidies is much less than that on investments.

Marginal Returns higher on Investments than on Subsidies

Given fiscal constraints, there is always a trade-off between allocating money through subsidies and increasing investments. Subsidies, unless they are well targeted and are for a limited period, are not equitable

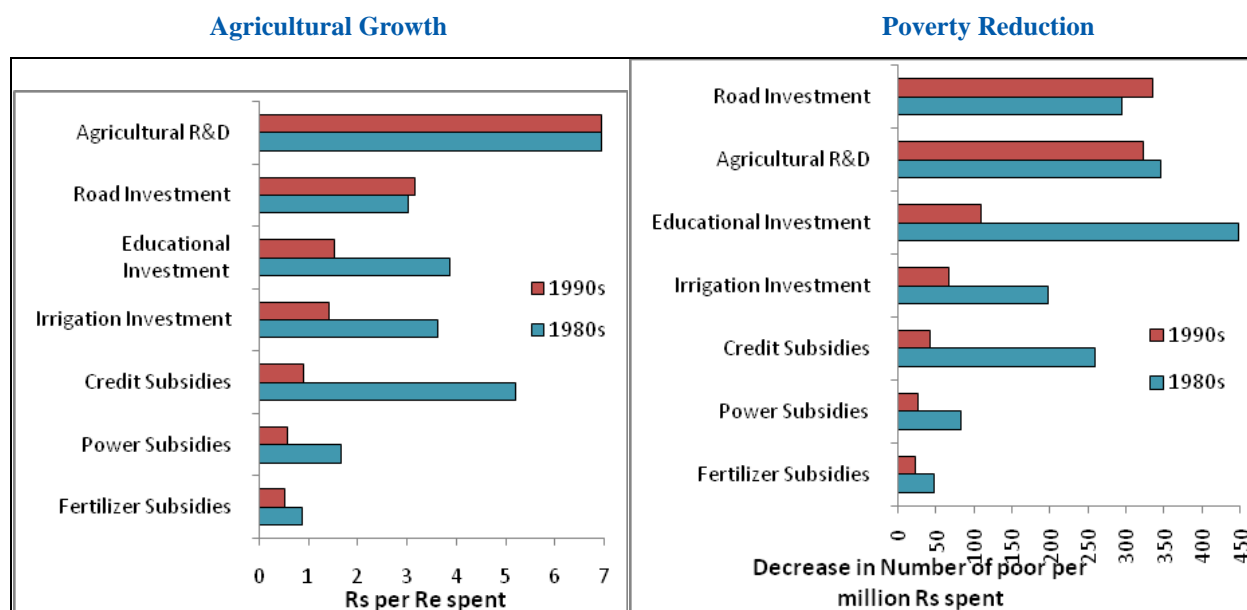
Figure 3: Composition of Public Expenditure on Agriculture



Source: CSO, Agricultural Statistics at a Glance, Various Issues

Note: All Estimates are at 2004-05 prices

Figure 4: Returns in Agricultural Growth and Poverty Reduction to Investments and Subsidies



Source: Fan, Gulati and Thorat 2007

& efficient and crowd-out public investment in agriculture research, irrigation, rural roads and power. There is an inherent moral hazard in use of subsidized inputs such as fertilizer and water and their excessive use leads to deterioration in the aquifers and soil creating an environmentally unsustainable system. Investments take time to fructify but result in sustainable and higher growth. Public investment especially in R&D drives technical change and productivity growth in agriculture, raising farm incomes and reducing prices for consumers. This has been corroborated by research² which shows that the marginal returns in terms of poverty alleviation or accelerating agricultural growth are much lower from input subsidies than from investments in rural roads or agri-R&D or irrigation or even on health and education (Figure 4). The allocation of public funds to subsidies for goods such as agricultural inputs that primarily benefit private individuals can divert funds away from public goods and other socially beneficial expenditures.

The way forward

The above analysis shows that rationalizing subsidies will not only

help divert budgetary support towards higher return investment but also ensure appropriate use of resources, particularly fertilizers, and also address the issue of controlling environmental damage. The present scale of subsidy in the agricultural sector poses a high fiscal burden on the central and state governments. Also, high agricultural input subsidies result in inefficient resource allocation; crowding out of public sector investment; and degradation of the environment and thus, affecting the agricultural productivity. Agricultural growth and poverty reduction depend critically on investments in rural infrastructure (irrigation, roads, transport etc.) as well as investments in markets, rural finance and research & extension. Thus, this imbalance between subsidies and investments needs to be urgently corrected for sustainable growth in Indian agriculture and overall inclusive growth. Reducing input subsidies will free public sector resources for building of rural infrastructure that can augment supplies, raise incomes and increase demand for agricultural products. We need to move to a system where all subsidies are targeted and given through conditional cash transfers.

There are technology options — Aadhaar card-linked bank accounts for instance — that make it possible today to deliver subsidies directly and most efficiently to targeted recipients.

Will the new Government bite the bullet and contain subsidies while enhancing investments in a transparent manner with time bound results? Anyone who has the political art of reorienting resources from subsidies to investments will be rewarded handsomely, in a political economy context, and which will be a win-win situation for the country as it will accelerate agri-growth to above 5 per cent, and reduce poverty even faster.

Endnotes

1. Shenggen Fan, Ashok Gulati and Sukhadeo Thorat, 'Investments, Subsidies and Pro-Poor Growth in Rural India', *Agricultural Economics* 39, 2008.

Reference

Shenggen Fan, Ashok Gulati and Sukhadeo Thorat, 'Investments, Subsidies and Pro-Poor Growth in Rural India', *Agricultural Economics* 39, 2008. □

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Dissecting Agricultural Performance Since Mid 1990s

Ramesh Chand



Agricultural development strategy should be expanded to bring marketing in its fold to improve competition, reduce inefficiency and harness market innovations. This should enable farmers to get better prices and higher share in prices paid by end users without adding to inflation. Without this, it will be very difficult to sustain the agricultural achievements of the last decade in the coming years



AGRICULTURE SECTOR in India and in many other countries faced several tough challenges for couple of years after implementation of the WTO agreement on agriculture in year 1995, primarily due to sharp fall in prices of agricultural commodities. The fall in prices led to perceptible decline in growth of agricultural output after the mid 1990's which had several consequences including widespread agrarian distress. It was a great challenge and formidable task to arrest the decline and to reverse the slowing growth of agriculture sector. Several initiatives were taken by the central and state governments to address this challenge. The last nine years (2004-05 to 2012-13) have witnessed impressive revival of agriculture growth rate even though growth rate of non agriculture sector decelerated in recent years. Besides growth per se, the quality of growth has also seen considerable improvement and there has been progress relating to inclusiveness, regional equity, and nutrition security. Though these achievements are highly significant and unique in many respects, there is not adequate appreciation or realization about these in the country. Many of us seem to be obsessed with

achievement of green revolution and not willing to acknowledge the recent accomplishments as these are not concentrated on revolution around one or two crops, or, concentrated in a particular geographic region. Second, high food inflation has overshadowed progress on production front. Proper understanding of the decline and improvement in performance of agriculture since the mid 1990s is very important for shaping the future of Indian agriculture. This paper compares the performance of agriculture in the recent years with the preceding decade and provides an update on the achievements of the agriculture sector in recent 10 years or so. It also discusses, with evidence, how and when the turnaround in agriculture took place, for developing proper understanding of India's agriculture growth story.

Growth Trend and Composition

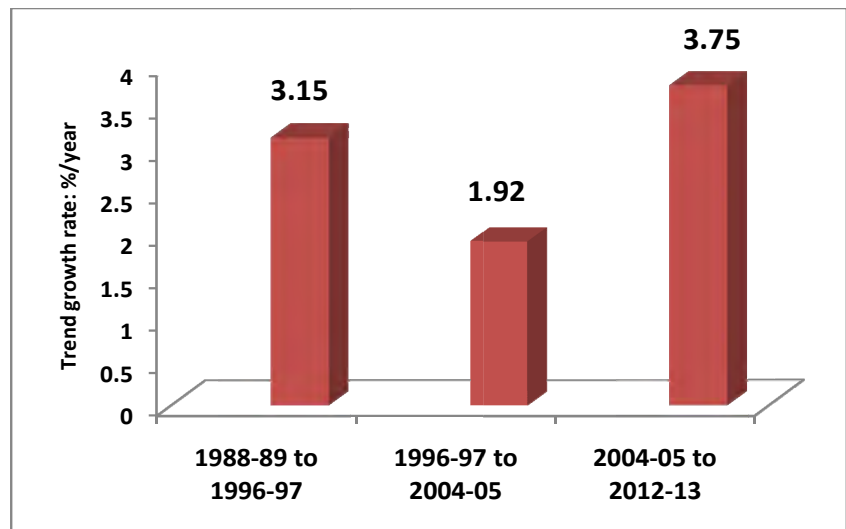
The country achieved close to 5 per cent average annual rate of growth in agriculture during 8th Plan (1992-93 to 1996-97) and fixed a target of 4.5 per cent growth for the 9th Plan (1997-2002). Against this target, the actual growth rate turned out to be 2.48 per cent during the 9th as well as 10th Plan. The target growth rate was fixed at 4 per cent for 11th Plan and the same has

The author is Director, National Centre for Agricultural Economics and Policy Research, New Delhi. Earlier he had served as Professor and Head – Agricultural Economics Unit at Institute of Economic Growth, Delhi. He has also been a Visiting Professor at University of Wollongong, NSW Australia (2000); and Visiting Fellow at Institute of Developing Economies, Chiba Shi, Japan (2003). He worked as consultant for FAO, ESCAP, OECD, World Bank, Indian Institute of Foreign Trade, Delhi and Government of Punjab. He is the author of a number of books and research papers published in reputed national and international journals.

been kept for the 12th Plan. Unlike the previous two Five Year Plans, the 11th Plan recorded an average growth rate of 4.06 per cent in the agricultural GDP. The growth rate during 2012-13, which is the first year of the 12th Plan has been 1.4 per cent and the advance estimate for 2013-14, which is the second year of 12th Plan, puts the growth rate at 4.6 per cent. The growth rates reveal that after growing at 2.5 per cent for 10 years, during 9th and 10th Plan, agriculture growth in the subsequent period has accelerated to 3.5 per cent level. It is interesting to find out precisely in which year the turnaround in growth rate took place, and how the period after turnaround compares with the corresponding period before turnaround.

According to a study done by Ramesh Chand and Parappurathu (2012), GDP of agriculture witnessed a structural break in the year 1995-96, which brought down the growth trajectory, followed by another break in the year 2004-05, which turned the growth path upward. The same can also be seen from the decadal trend growth rates in the agricultural GDP beginning with the decade 1971-72 to 1980-81 and ending with the decade 2003-04 to 2012-13 (Fig. 1). When ten years period is used to estimate trend growth rates, two clear breaks are observed, one in 1996-97 and

Fig 2: Growth Rate in GDP Agriculture and Allied Sector at 2004-05 Prices

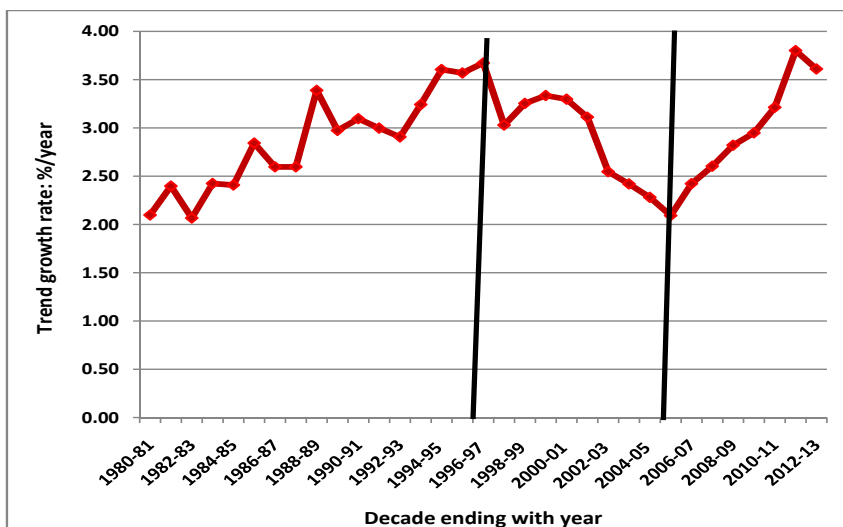


another in 2005-06.

The above evidence clearly points out that the performance of agriculture during the last two decades can be divided in two phases: phase I from 1995-96 to 2005-06 representing a period of slowdown in agriculture, and, phase II beginning with year 2005-06 representing a period of recovery and acceleration in growth. Further, a comparison of growth rates achieved during the decade beginning from 2004-05 is made with the previous two decades. The data on GDP of the sector (agriculture and

allied) after 2004-05 is available till year 2012-13 i.e. for nine years. The trend of growth rates in GDP during recent decade (nine years only) at constant prices and for similar two previous periods is presented in Fig 2. This shows that Indian agriculture moved on a growth trajectory of 3.15 per cent per annum during 1988-89 to 1996-97 which plummeted to 1.92 per cent in the next nine years. This was a very low growth having several adverse effects on farm economy and livelihood of farming community and posed a serious threat to the national food security.

Fig.1: Growth Trajectory of GDP Agriculture in various decades from 1971-72/1980-81 to 2003-04/2012/13



Some initiatives were taken towards the end of 10th Plan and during 11th Plan to revive the sector. Consequently, the growth rate accelerated to 3.75 per cent during 2004-05 to 2012-13. It is a matter of pride for the country that agriculture sector moved back on long term growth trajectory and now approaching targeted growth rate of 4 per cent.

Broad based Growth

The increase in growth rate of agricultural output was not confined to a few segments or commodity groups or to dominant products. Rather, the growth has been experienced across the board. Within the subsectors, crop sector recorded 3.3 per cent and

fruits and vegetables recorded 5.3 per cent annual rate of growth. Livestock output increased at 4.8 per cent per annum while fishery sector recorded 4.5 per cent growth rate. The rate of growth in the recent decade has been historical in most cases. Growth rate of crop sector in recent nine years (2003-04 to 2011-12) has been 75 per cent higher than the previous decade (Table 1). The growth rate in livestock and horticulture growth was higher by 41 per cent and fisheries by 48 per cent over the preceding nine years period.

Performance of Various Crops

Foodgrain production in India increased from 190 to 206 million tonne (mt) between 1995-97 and 2003-05 registering an increase of 16 mt in 8 years. In the next 8 years, foodgrain production increased by more than 50 mt and reached 257 mt by 2011-13. Rice, wheat and maize witnessed a record increase in their production after 2003-05. Maize production in the country was below 10 mt till 1995-96 and crossed level of 21 mt in year 2010-11. Thus, maize production in the country doubled in 15 years.

Pulse production in India stagnated around 13 mt for 15 years from 1990-91 to 2005-06. It showed record growth in year 2010-11 with output climbing up by 25 per cent in one year, from 14.6 mt to 18.2 mt.

Soybean and cotton have shown miraculous growth with doubling of output in about 8 years. India now produces 13.4 mt of soybean and 34.6 million bales of cotton as against the production of 7.3 mt of soybean and

Crop/ group	1994-95 to 2003-04	2003-04 to 2012-13
Foodgrains	0.71	2.66
Cereals	0.81	2.61
Pulses	-0.64	3.31
Rice	0.62	1.99
Wheat	1.03	3.60
Maize	4.43	5.51
Gram	-2.37	5.59
Pigeonpea	0.14	2.05
Oilseeds	-1.65	2.47
Soybean	3.35	7.61
Sugarcane	-0.47	4.01
Cotton	-2.23	10.46
Fruits and vegetables	2.64	6.26
Vegetables	3.24	6.37
Fruits	1.53	6.04
Banana	0.92	7.57
Mango	0.96	4.44
Citrus	4.50	5.34
Onion	3.07	12.98
Potato	2.90	8.94

15.1 million bales of cotton in 2003-05. Indian agriculture made another very noteworthy achievement by raising output of sugarcane. Sugarcane production in India reached close to 300 million tonne in year 1999-2000 and faced decline thereafter, cane production recovered in year 2006-07 in a big way. Current level of sugarcane output is 350 mt and India is having large surplus of sugar.

India produced 114 mt of fruits and vegetables in the mid 1990's. In next 8 years, production increased to 143 mt. Between 2003-05 and

2011-13, production of fruits and vegetables increased to 235mt. Both vegetable as well fruit production increased by more than 60 per cent in 8 years after 2003-05 which is much higher than the growth in the previous period. These growth rates have taken fruit production to 77 mt and vegetable production to 158 mt during 2011-13.

The increase in production of onion and potato has been remarkable. Onion production increased from 6.18 mt in 2003-05 to 16.9 mt in 2011-13. Production of potato, which increased by less than 2 mt in 8 years before 2003-05 showed an increase of nearly 20 mt in recent 8 years.

Trend growth rates in production of various crops are presented in Table 2. The growth rate in many crops was negative during 1994-95 to 2003-04, which has been reversed in the recent decade. In other cases, there has been sharp acceleration. It is worth mentioning that cotton production

Table 1: Trend growth rate in output of various sub sectors of Agriculture: (in per cent)

Sub sector	1987-88 to 1995-96	1995-96 to 2003-04	2003-04 to 2011-12
Crop sector	2.97	1.87	3.28
Livestock	4.10	3.43	4.84
Fruits and vegetables	4.29	3.79	5.33
Fishery sector	7.22	3.02	4.48

Table 3: Trend growth rate in production of Livestock and Fish: (per cent/year)

Product	1994-95 to 2003-04	2003-04 to 2011-12
Milk	3.78	4.72
Egg	5.69	6.20
Marine fish	0.71	2.01
Inland fish	5.55	5.99
Total fish	3.04	4.30

followed double digit growth in last 10 years while soybean, maize and gram experienced more than 5 per cent annual growth. Output of pulses, which was stagnating for quite some time, also moved on a rising trend with growth rate of more than 3 per cent.

The growth rates in output of horticultural crops during the decade 1994-95 to 2003-04 and 2003-04 to 2012-13 reveal grand success of the horticulture in the second decade. Growth rate in fruits as well as vegetables accelerated from 2.64 per cent during 1994-95 and 2003-04 to 6.26 per cent during 2003-04 to 2012-13. Among vegetables, onion production recorded almost 13 per cent annual growth while potato production increased by 8.9 per cent per year. Among various fruits, highest growth is observed in banana with 7.57 per cent.

Performance of Livestock and Fishery Produce

All livestock and fishery products showed higher growth after 2003-04 compared to 1994-95 to 2003-04 (Table 3). Milk production growth accelerated after 2003-04, from 3.78 per cent per annum to 4.72 per cent per annum. Growth in production of egg accelerated from 5.69 to 6.2 per cent. After 2003-04, growth rate in marine as well as inland fishery witnessed acceleration. Output of marine fish increased by less than 1 per cent a year during the 10 years period before 2003-04. The growth rate picked up to 2 per cent in the recent decade. Inland fish experienced more than 5.5 per cent annual increase during 1995-96 to 2003-04 which further increased to close to 6 per cent.

Agricultural Growth at State Level

The growth rate in NSDP agriculture across states varies from (-) 1.15 per cent in Kerala to 5.91 per cent in Chattisgarh (Table 4). The states like Madhya Pradesh, Karnataka, Rajasthan, Jharkhand and Chattisgarh achieved more than 5 per cent annual growth rate in agriculture, and Gujarat, Tamil Nadu, Maharashtra and Andhra Pradesh, exceeded the national target of agriculture growth. Haryana, recorded close to 4 per cent annual growth in NSDP agriculture even with high level of productivity. In east India, both Assam and Bihar recorded more than 3 per cent annual growth.

Uttar Pradesh and Odisha are still stuck in low growth trap. The state of Punjab comes at the bottom in the list of states which recorded

positive growth in agriculture, with only 1.5 per cent annual growth. In the North West Himalayan region, agriculture growth rate in Jammu & Kashmir and Uttarakhand was around 2 per cent whereas agriculture was stagnant in the state of Himachal Pradesh. In West Bengal, agriculture sector was growing at about 2 per cent per annum. Agriculture sector was found to be shrinking in the state of Kerala.

Initiatives and Factors Underlying the Achievements

Performance of agriculture improved in the last decade as a result of strong policy and institutional support provided to the sector. The major contributing factors are:

- Improvement in terms of trade for agriculture in the last 10 years and remunerative prices for farm produce.
- Higher use of productivity enhancing inputs like fertilizer and quality seed.
- Expansion of irrigation and increase in agricultural investments supported by public sector capital formation.
- Substantial increase in the supply of institutional credit to agriculture.

Table 4: Growth rate in NSDP Agriculture during 2004-05 to 2011-12 at 2004-05 Prices in Major States: (in per cent)

State	Trend growth rate	State	Trend growth rate
Chhatisgarh	5.91	Haryana	3.94
Jharkhand	5.76	Assam	3.84
Rajasthan	5.63	Bihar	3.32
Karnataka	5.59	Odisha	2.67
Madhya Pradesh	5.22	Uttar Pradesh	2.33
		Jammu & Kashmir	2.04
Andhra Pradesh	4.94	West Bengal	1.98
Maharashtra	4.84	Uttarakhand	1.95
Tamil Nadu	4.21	Punjab	1.49
Gujarat	4.08		
		Himachal Pradesh	-0.09
All India	3.70	Kerala	-1.15

- Achievements in technology and strengthening of extension.
- Initiatives like NFSM, RKVY and BGREI and other missions and programmes.

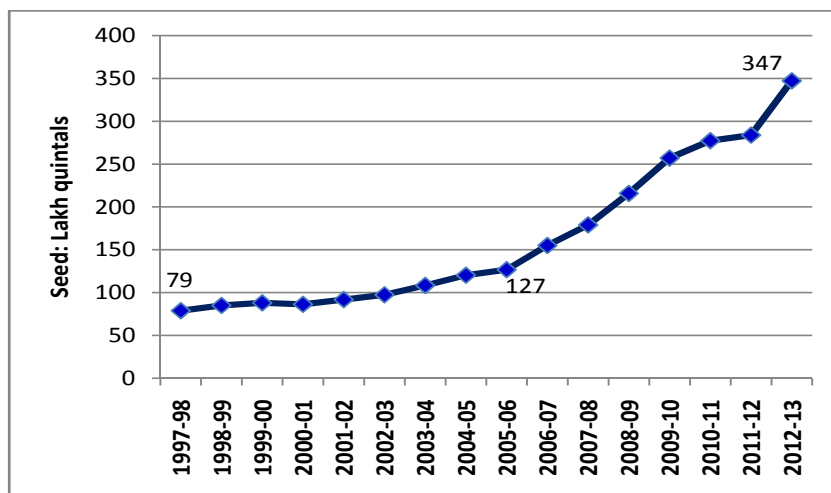
Better Pricing

Terms of trade between agriculture and non-agriculture, represented by ratio of implicit price deflators of agriculture GDP to non-agriculture GDP, followed a decline of 7 per cent between 1997-98 and 2004-05. Thereafter, agricultural prices received by farmers increased at a faster rate under the influence of the substantial hike in the minimum support prices, higher level of foodgrain procurement by government agencies, strong domestic demand and rise in international prices. Between 2004-05 and 2011-12, agricultural prices relative to non-agricultural prices have risen by about 30 per cent (Fig.3). Thus, better pricing environment provided incentive to farmers to use more and better input and adopt modern technology.

Higher Use of Material Inputs

Supply of certified or quality seed in the country increased by about 50 per cent between 1997-98 and 2004-05 (Fig. 4). In the next 8 years, the seed supply increased by more than 100 per cent. As seed is the carrier of technology, the growth in supply of

Fig 4: Supply of Certified or Quality Seed: (in Lakh quintal)



quality seed has been a major factor for increase in agriculture production in recent years. Similarly, use of fertilizer which showed a meager increase of 14 per cent during 1997-98 to 2004-05 increased by 50 per cent in next 7 years, from 18.4 million tonne (mt) of NPK in 2004-05 to close to 28 mt in year 2011-12 (Fig 5).

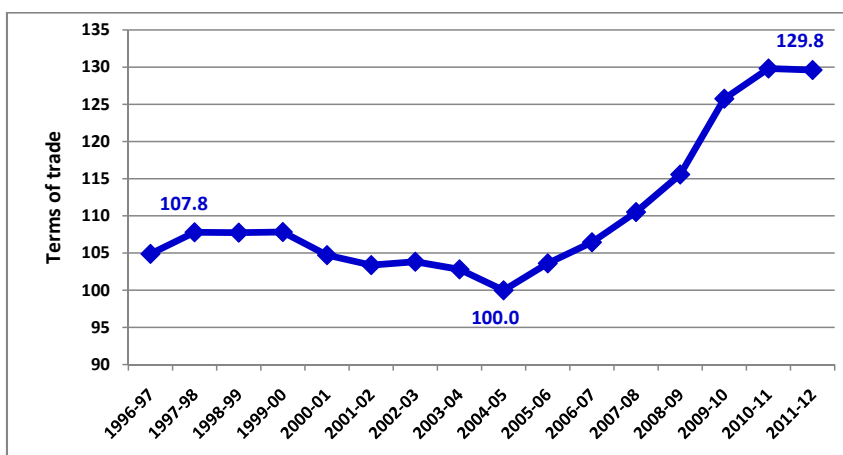
Electricity Consumption and Irrigation Expansion

Consumption of electricity for agriculture purposes and expansion of gross irrigated area are closely linked (Fig. 6). Electricity consumption in agriculture sector was 85.7 thousand GWh in year 1995-96. The consumption increased to 97.2 thousand GWh by the year 1998-99

and sharply declined thereafter. It reached bottom level in year 2001-02 and then started increasing slowly. The consumption of electricity in agriculture picked up in year 2006-07 and the upward trend continued thereafter. The electricity consumption reached 129 thousand GWh in year 2010-11. Between 1998-99 and 2005-06, electricity consumption in agriculture declined by 7 per cent and in next 5 years, it increased by as much as 43 per cent.

Expansion in gross irrigated area showed somewhat similar pattern as seen in electricity consumption in agriculture. During the ten years period from 1995-96 and 2004-05, gross irrigated area increased by 10 million hectare from 71.4 million hectare to 81.1 million hectare. The provisional data available for the recent years shows an increase of 8.3 million hectare in the next six years.

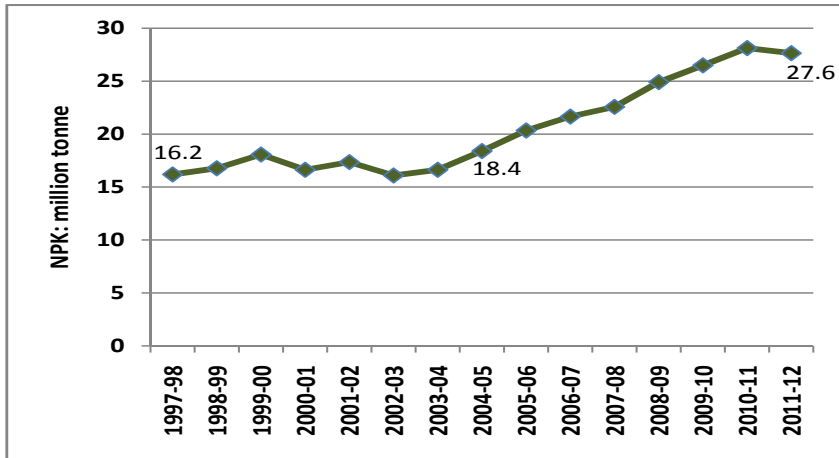
Fig. 3: Terms of Trade between Agriculture and Non-Agriculture



Conclusions and Lessons

During the last two decades, since mid 1990s, Indian agriculture has moved through two distinct phases. The period from mid 1990s to mid 2000s witnessed slowdown of agriculture growth from above 3.5 per cent to below 2 per cent. This has been followed by a sharp turnaround in year 2005-06 which took agriculture back to above 3.5 per cent growth. The most important

Fig 5: Use of Fertilizer in India: NPK: (in million tonne)



factor for improved and impressive performance of agriculture, post 2004-05, has been the increase in the prices received by the farmers. This was a result of hike given to MSP, increase in foodgrain procurement, increase in global agricultural prices and strong domestic demand for food. Favourable prices induced farmers to use better seed, apply higher doses of inputs, take better care of crops and livestock, adopt improved technology and methods of production. This process was further aided by liberal supply of institutional credit and irrigation expansion. Slowdown of agriculture growth and its recovery in response to changes in price and non price factors clearly establish that Indian farmers respond rather strongly to various

types of incentives. It also refutes to some extent the argument that the interest in farming is diminishing. We find the interest depends on profitability from farming.

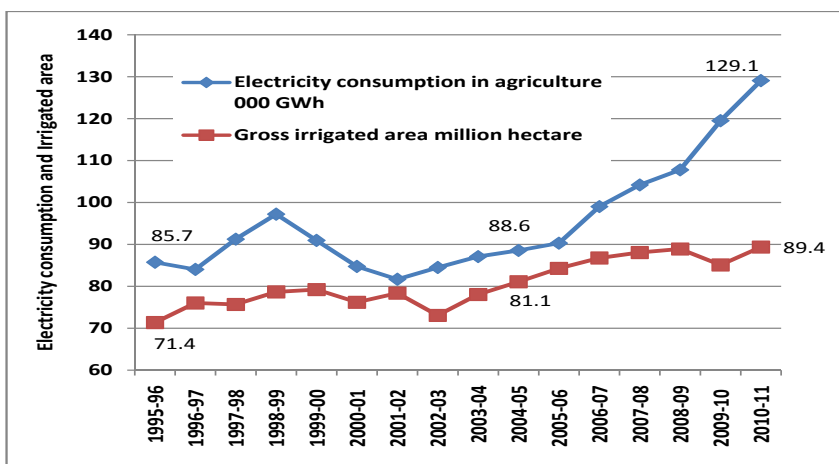
State level comparison of agriculture growth offers useful lessons. With the same set of national policies and macro environment, some states achieved more than 5 per cent growth and some could not grow even at 3 per cent. Low growth states, particularly Uttar Pradesh and Odisha, can learn a lot from the experience of the states like Chhatisgarh, Jharkhand, Rajasthan, Karnataka, Madhya Pradesh, Andhra Pradesh and Maharashtra.

It is a challenge to maintain the growth tempo achieved during 2004-

05 to 2013-14. As no country can afford to keep real agricultural prices rising for a very long time, therefore, ways and means have to be devised to sustain profitability incentive. One way to maintain price or profitability incentive for farmers is to increase their share in final prices paid by consumers and other end users. The second source is technology either through resource saving or through increase in productivity. The agricultural development strategy in the last ten years has focused on production and MSPs. For a long time, significant progress has not been made in agricultural markets like reforms in market regulation, development of infrastructure, entry of modern capital, and development of new models of marketing. Thus, agricultural marketing has not moved to the next stage of development (Ramesh Chand, 2012). Agricultural development strategy should be expanded to bring marketing in its fold to improve competition, reduce efficiency and harness market innovations. This should enable farmers to get better prices and higher share in prices paid by end users without adding to inflation. Without this, it will be very difficult to sustain the agricultural achievements of the last decade in the coming years.

(The paper is drawn from larger work "From Slowdown to Fast Track: Indian Agriculture Since 1995", by Ramesh Chand, Working Paper 1/2014, National Centre for Agricultural Economics and Policy Research, New Delhi.)

Fig. 6: Progress in Electricity Consumed in Agriculture and Expansion of Irrigation



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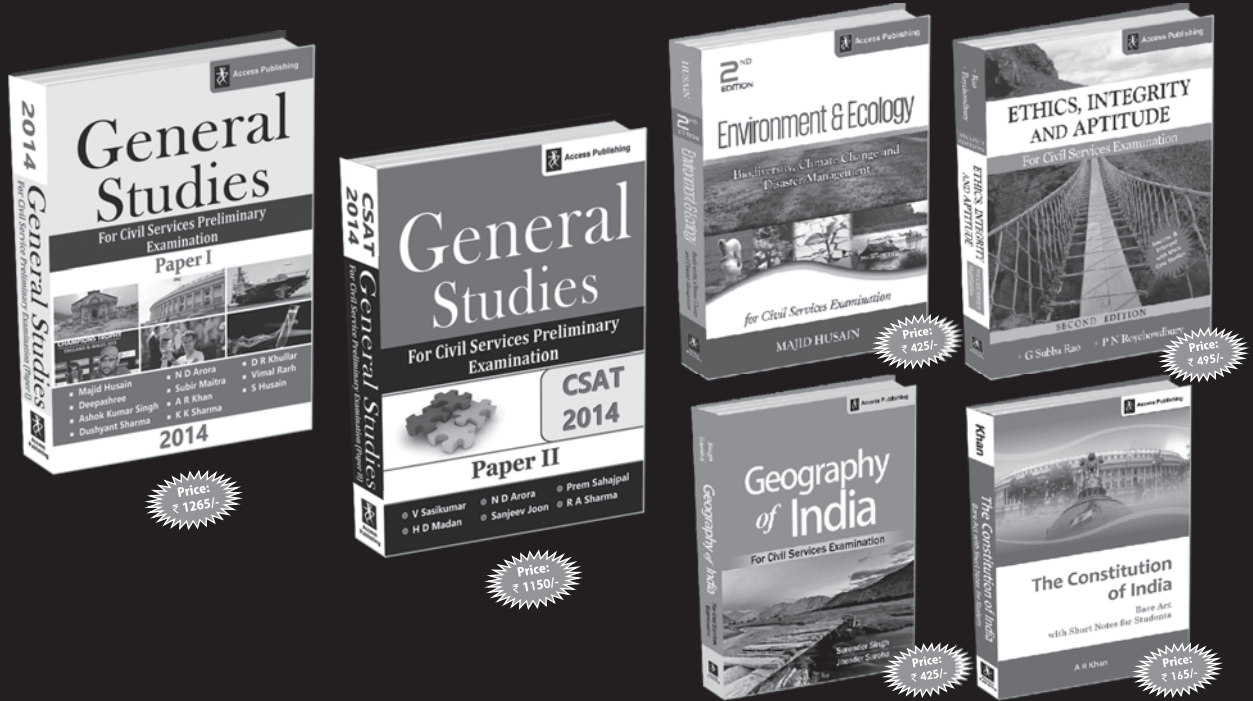
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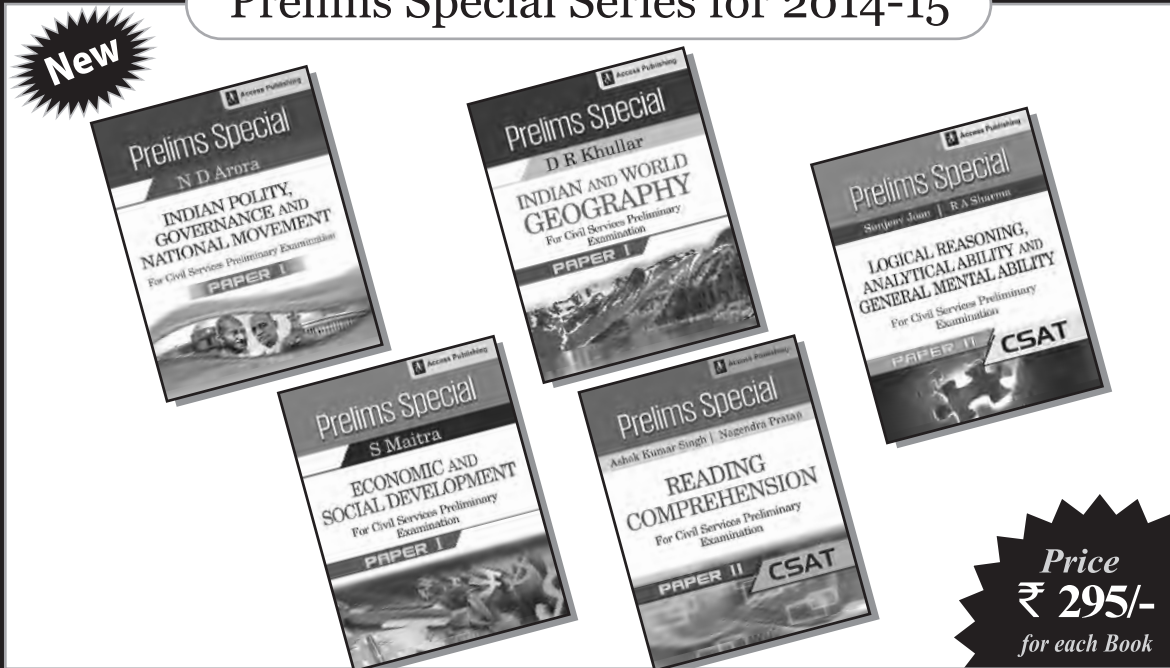


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Building State Capacity in India

Ajay Shah



...an active State is unambiguously required. Every civilized country has a capable State which performs these functions and avoids interfering with the freedoms of citizens in any other respect. The challenge of State capacity is that of efficiently converting expenditures into public goods outcomes while avoiding unintended consequences

THERE IS considerable anguish in India today about malfunctioning State apparatus. It is important to distinguish between objectives and execution. Reasonable men may disagree about whether or not it is useful for the Indian government to run NREGA, or a system of capital controls, or censorship of electronic media, or traffic lights. But regardless of the merits of each of these objectives, we can agree that we should have the ability to achieve the desired outcomes on stated objectives. In previous decades, there was a great focus on dismantling controls, reversing the license-permit raj and putting an end to industrial policy where the government determines what industries or technologies are good. There is, indeed, a need to comprehensively back away from those approaches, which were pursuing the wrong objectives. However, the challenge today is not just of deregulation, of stroke-of-the-pen reforms which eliminate laws and close down existing government organizations. There is no escaping the role for the State in core public goods such as safety. Only the State can build the criminal justice system, the defense forces, and manage international relations. Only the State

can build core public goods. Only the State can address the three market failures of externalities, market power and asymmetric information. In these areas, an active State is unambiguously required. Every civilized country has a capable State which performs these functions and avoids interfering with the freedoms of citizens in any other respect. The challenge of State capacity is that of efficiently converting expenditures into public goods outcomes while avoiding unintended consequences.

India has fairly sophisticated thinking and policy discussion on the question of what government should do. The binding constraint today lies in State capacity, which may be defined as the ability to convert objectives + resources into outcomes. As Pritchett (2009) says, 'I argue that India is today an ailing state, a nation-state in which the head, that is the elite institutions at the national (and in some states) level remain sound and functional but that this head is no longer reliably connected via nerves and sinews to its own limbs'. All protagonists in the public policy debate should be able to agree on the need to solve the implementation shortfall which affects the Indian State. As an example, consider the field of infrastructure. The old debate about

The author currently co-leads the Macro/Finance Group at NIPFP in New Delhi. He has held positions at the Centre for Monitoring Indian Economy, Indira Gandhi Institute for Development Research and the Ministry of Finance, and has engaged in academic and policy-oriented research in the fields of Indian economic growth, open economy macroeconomics, public finance, financial economics and pensions. He studied at IIT, Bombay and USC, Los Angeles

infrastructure was about public versus private production of infrastructure services. The bulk of infrastructure can indeed be constructed and operated by private firms but the desired outcomes are obtained only if the government delivers on the functions of planning, contracting and regulating. There is no escaping the problems of State capacity, in achieving government structures to make internally consistent plans for infrastructure, to execute sound contracts that shape the behavior of private firms in the right ways, and to regulate private firms once projects have been completed. Almost all the problems of Indian infrastructure today can be traced to deficiencies of the State in planning, contracting and regulation. When there are infirmities in planning, contracting or regulating, PPP contracting can give outcomes that are worse than the erstwhile State-centric approaches.

The bulk of infrastructure can indeed be constructed and operated by private firms but the desired outcomes are obtained only if the government delivers on the functions of planning, contracting and regulating. There is no escaping the problems of State capacity, in achieving government structures to make internally consistent plans for infrastructure, to execute sound contracts that shape the behavior of private firms in the right ways, and to regulate private firms once projects have been completed.

Most people agree that the government should embark on eliminating salmonella in the supply chain of eggs and meat. But once such an objective is agreed upon and adequately resourced, the question arises about how government should be organized so as to translate objectives and resources into outcomes. This is the defining bottleneck in India today. In this article, we ponder over some

thoughts on how to construct State capacity.

The Black Box View

At the simplest, every organization can be viewed as possessing a leadership which utilizes certain resources in order to achieve certain objectives. The organization will perform when two tests are satisfied. First, is the leadership of the organization in full control of the way in which resources are utilized. Second, is whether the leadership is accountable. An accountable leadership which is in control of the organization will respond to failures and make changes on the way things are done so as to achieve the desired outcome. This motivates an exploration of accountability and operational autonomy.

Accountability through Elections, Legislature and Judiciary

In every well functioning democracy, there is a 'long route of accountability' that works through elections, legislature and judiciary. The ruling administration is accountable in general elections. There is a weak mechanism through which the performance of a ministry affects the job security of the minister. The legislature exerts checks and balances upon the executive (Kapur and Mehta, 2006). The judiciary prevents transgressions of the rule of law to the extent that this is enabled through well drafted laws.

However, this 'long route of accountability' is a diffused form of accountability. The persons working in one Ministry or in a public body often feel little pressure from the coming general elections or Parliament. As long as laws are not visibly violated, the judiciary is quite respectful of executive discretion, particularly through the 'expert body doctrine'. Improvements in the working of the legislature and the judiciary will undoubtedly improve accountability and thus increase State capacity. In this article, we treat the working of the legislature and the judiciary as given, and focus on strategies for public

administration that are conducive to obtaining performance. These ideas can be valuable for all three: the legislature, executive and judiciary.

Principles for assigning roles and functions

To a maximal extent, need clear problem statements that can be assigned outside departments of government

To improve accountability, we must sharpen the problem statement. For example, a precise problem statement such as 'Deliver 24 hour water supply at stated engineering characteristics of purity and pressure' makes possible contracting-out from the Principal (government) to an Agent (a water utility). The Agent can

Within the main structure of government, the strategy must hence be one of identifying all possible sub-problems where contracting-out can be done to an Agent either to a private firm or to a public body. This would leave the minimum possible set of problems where contracting-out is not feasible left to be performed by government itself, where we are down to the long route of accountability.

then have no interest in the process of winning the next elections. It focuses on one sub-problem, that is coded into its contract. It is held accountable for delivering on that one problem. Public bodies work better when there is a sharp and clear problem statement. As an example, a central bank can be organized around an inflation target.

The Agent, the central bank, is given the objective of delivering 4 per cent CPI inflation and certain strictures are imposed upon failure. This generates accountability. In contrast, if the objectives of a central bank are poorly stated, this creates an environment of failure.

The fundamental principle of management is that there must be an objective, the performance must be measured, and success/failure should have consequences. This is infeasible within the main structure of government. Within the main structure of government, the strategy must hence be one of identifying all possible sub-problems where contracting-out can be done to an Agent either to a private firm or to a public body. This would leave the minimum possible set of problems where contracting-out is not feasible left to be performed by government itself, where we are down to the long route of accountability. Politics in the real world is inevitably an arena of complex, imprecise and conflicting objectives. Writing down precise objectives is not easy. The job of public

Politicians are the ones best equipped to hear rival interest groups and make political decisions, as they are the ones accountable in elections. These decisions should take place close to the Cabinet and can generally not be contracted out. Problem statements that are contracted out either to a public body or to a private firm should be precisely stated and should only require technical inputs in translating the objective into execution. Bureaucrats and technical experts should not dabble in politics and vice versa.

administration in the departments of government is one of sifting through the fog and emerging with a list of precise problem statements, which can then be contracted out, thus leaving as little as possible to be done within the main structure of government. In the international discourse, contracting-out is better from the viewpoint of accountability. In addition, in India, contracting-out is better as the human resource and management problems are greatest in core government and

can be eased in external organizations whether in the public or private sectors.

Political considerations must precede the contracting-out

When the Principal writes down a clear objective that the Agent must perform, political considerations must be taken into account before phrasing the objective. As an example, political considerations are legitimate considerations in planning the highway system. For this reason, the planning function of determining what highways are to be built should be placed under political control e.g. within a Ministry.

Once a decision has been made, say to build an expressway from Bombay to Calcutta, this can be handed out to a public body such as NHAI which can do contracting and then to a private firm which can build the highway. If the Agent is given a political objective e.g. if NHAI is tasked with choosing what highways to build, this will create conflicts in management and diffuse accountability. Politicians will legitimately interfere in the working of the Agent. Accountability will be lost as the leadership of the Agent will be able to say that their work was undermined by political interference.

Political objectives require decisions by elected representatives of the people. Politicians are the ones best equipped to hear rival interest groups and make political decisions, as they are the ones accountable in elections. These decisions should take place close to the Cabinet and can generally not be contracted out. Problem statements that are contracted out either to a public body or to a private firm should be precisely stated and should only require technical inputs in translating the objective into execution. Bureaucrats and technical experts should not dabble in politics and vice versa. One example of strategy is found in Srikrishna (2013) which explicitly identifies and places political

functions with the government and not with regulators where operational autonomy is desired.

Going from a Khap Panchayat to the rule of law requires precise objectives and narrow powers

In a feudal environment, various interest groups lobby with the State to obtain help. The powers of the State have no limits. State structures have discretion about the purposes to which the coercive power of the State is applied. As an analogy, a person goes to a khap panchayat of powerful village elders with a grievance, and the khap panchayat chooses whether or not to use its power in order to help him.

An essential feature of the rule of law is the establishment of public administration structures through which executive discretion in helping a supplicant in open ended ways is removed. This requires a new wave of well drafted laws which have precise objectives and only authorize coercive power to the minimum extent required to achieve those precise objectives.

From a public choice theory perspective, we see politicians and bureaucrats as self-interested actors. When there is vagueness of objectives and powers, this sets the stage for non-performance, where vagueness is used to pursue personal objectives. A feudal lord pursues his own interests above the interests of anyone else. As an example, when a firm or an industry faces competitive pressure, it is quite common in India to approach government or regulators and ask for help. The instinct of helping friends, or obtaining IOUs by helping powerful people, is ingrained in everyone. All too often, help is given by relaxing rules for the industry which is doing badly or making life difficult for new technology which is creating competitive pressure. These are feudal methods; they are khap panchayat mechanisms; they interfere with the working of competitive markets. They have no place in modern India.

An essential feature of the rule of law is the establishment of public administration structures through which executive discretion in helping a supplicant in open ended ways is removed. This requires a new wave of well drafted laws which have precise objectives and only authorize coercive power to the minimum extent required to achieve those precise objectives.

As an example, Section 11B of the SEBI Act features astonishing powers for the pursuit of an astonishingly vague objective:

... if after making or causing to be made an enquiry, the Board is satisfied that it is necessary, - (i) in the interest of investors, or orderly development of securities market; or (ii) to prevent the affairs of any

A new wave of well drafted laws, on the lines of Srikrishna (2013), are required, which articulate precise objectives, give the executive the minimum possible powers through which those objectives can be achieved, and hold the executive accountable for performance. A sea change in perspective is required, from thinking of the executive as a feudal authority armed with vast powers, to thinking about the executive as being held accountable for converting precisely stated objectives into outcomes, under an environment of the rule of law.

intermediary or other persons referred to in section 12 being conducted in a manner detrimental to the interests of investors or securities market; it may issue such directions, - (a) to any person or class of persons referred to in section 12, or associated with the securities market; or (b) to any company in respect of matters specified in section 11A, as may be appropriate in the interests of investors in securities and the securities market. With this section, the management of SEBI has been given powers to

pursue the vague objective of 'the interest of investors'. In keeping with the predictions of public choice theory, SEBI has vigorously used Section 11B in writing regulations and in writing orders. The presence of 11B in the SEBI Act has supported the feudal mindset at SEBI, where supplicants come into SEBI and articulate grievances.

A new wave of well drafted laws, on the lines of Srikrishna (2013), are required, which articulate precise objectives, give the executive the minimum possible powers through which those objectives can be achieved, and hold the executive accountable for performance. A sea change in perspective is required, from thinking of the executive as a feudal authority armed with vast powers, to thinking about the executive as being held accountable for converting precisely stated objectives into outcomes, under an environment of the rule of law.

The law is a contract between the Principal and the Agent

There are three different mechanisms for contracting out:

1. Contracting-out to a private firm through a contract between the Principal and the Agent, which is thereafter adjudicated under the Indian Contract Act of 1872.
2. Contracting-out to a public body that is established by executive order.
3. Contracting out to a public body that is established by an Act.

In each case, there is a legal instrument (the contract, the executive order, or the Act). The principles articulated in this article should shape this legal instrument under all three cases.

Principles pertaining to public bodies

Every public body must have a clear objective

It does not suffice to require that the problem statements placed with

public bodies be well specified. In addition, every public body must have clarity of purpose. Even if sub-problems P1 and P2 are well-posed, if both are placed in the same organization, there is the possibility of a loss of accountability when these sub-problems are conflicting or if one objective overwhelms another. It is all too easy for the Agent to claim that it failed on objective P1 as it was pursuing objective P2, and that it failed on objective P2 as it was pursuing objective P1.

As an example, RBI has been given the objectives of monetary policy, investment banking for the government and banking regulation. This arrangement suffers from conflicts of interest. It is possible to do well on the investment banking objective by distorting banking regulation and monetary policy. It is possible to do well on the banking regulation

The board should not be a show-piece: All important decisions should take place at the board.

Shareholders should not meddle in the working of the organization other than through the appointment process of the board, and the working of the board. Second, the board should have a majority of independent directors, to prevent excessive influence of insiders, who have an incentive to be lazy and cover up mistakes. Third, the board should work in an adversarial way, with repeated recourse to formal voting in resolving conflicts.

objective by distorting monetary policy and investment banking. This leads to a loss of accountability as failure and the action can be explained away on the grounds that other objectives were being pursued. The reverse problem arises when multiple government agencies are placed in charge of the same problem. This leads to a balkanization of law

and regulation, diffuses accountability and generates extreme legal risk for the private sector. Sound design of organization structures in government needs to avoid this problem also. Hence, two distinct perspectives are required. At the level of the Principal (government), the task is that of translating the overall objective of public goods and addressing market failures into a large number of concrete sub-problems which can be contracted out with sharp accountability. At the level of each Agent, when more than

High performing public bodies are those which feature a blend of high clarity of purpose, precise and limited powers, high accountability mechanisms, high independence and high operational flexibility. These features should be seen as a package deal. Independence and operational flexibility are an essential feature of performance by public bodies but only when powers are limited, and there is strong accountability for a clear objective.

one objective is present, it is important to confirm that the objectives and accountability of the organization are clearly established.

Apply good governance principles to the working of public bodies

In the private sector, we know the three key principles of sound governance. First, all power should vest with the board. The board should not be a show-piece: All important decisions should take place at the board. Shareholders should not meddle in the working of the organization other than through the appointment process of the board, and the working of the board. Second, the board should have a majority of independent directors, to prevent excessive influence of insiders, who have an incentive to be lazy and cover up mistakes. Third, the board should work in an adversarial way, with repeated recourse to formal voting in resolving conflicts.

These principles are equally relevant for public bodies and can be adapted into the public sector setting as four rules:

1. All important decisions should take place at the board; there should be no centre of power other than the board. The government should not meddle in the working of the public body other than through the appointment process, and the positions taken in board discussions by nominees of the government.
2. In most situations, public bodies will work better when independent experts are in a majority in the board.
3. All decisions should be taken through a formal process of voting with public disclosure of the voting record.
4. The board of a public body should work under full transparency: (i) Publication of agenda papers atleast one week before the board meeting; (ii) Live streaming video from the board meeting; (iii) Publication of the minutes of the board meeting immediately after the meeting.

The application of these four rules in a public body will yield superior thinking and decision making of a kind that is hard to induce within a government department. This is one reason why contracting-out of well specified problems to public bodies (or private firms, by a department of government is always superior to performing those tasks internally.

High operational flexibility and high independence for public bodies

Public bodies in India have low operational flexibility with restrictions upon the human resource process, methods of contracting and financial rules. They also have low independence in the sense of being subject to back-seat driving by Ministries.

Under present conditions, the case for operational flexibility of public bodies is a controversial issue. On one hand, the leadership of public bodies

argues that the lack of operational flexibility and independence hampers their ability to deliver performance. On the other hand, in an environment where objectives and accountability mechanisms are not clearly defined, and sweeping powers are given, there are important risks in having operational flexibility and independence in the hands of unelected bureaucrats. There is an important difference between a Ministry headed by a person who has no job security as opposed to a public body headed by an unelected person who has no risk of losing his job.

Some argue that the lack of operational flexibility on human resource policies and in contracting is a mechanism through which politicians are kept in check. At the same time, the danger of abuse of these powers is entirely about the lack of accountability. If the objectives are clear, the powers

There are strong connections between the themes of clarity of objective, accountability mechanisms, operational flexibility and independence. All four elements should be seen as a package deal. It is only safe to give operational flexibility and independence to the leadership of a public body which has clarity of objectives and ample accountability mechanisms; otherwise the power will be abused.

are controlled, and the accountability mechanisms are adequate, there need be no restrictions upon operational flexibility. As an example, a private firm in a competitive market is held accountable by the clear objective of obtaining profits. In this environment, extreme operational autonomy is appropriate.

There are strong connections between the themes of clarity of objective, accountability mechanisms, operational flexibility and independence. All four elements should be seen as a package deal.

It is only safe to give operational flexibility and independence to the leadership of a public body which has clarity of objectives and ample accountability mechanisms; otherwise the power will be abused. Conversely, it is only when there is operational flexibility and independence that the leadership can be held accountable, otherwise the leadership will have plausible deniability in explaining away failure.

In Section 4.1, it was argued that the Ministry must identify all sub-problems where contracting-out is feasible, and keep within itself all the messy problems which cannot be contracted out. The Ministry will thus be the arena of diffused accountability. The working of government departments hence requires elaborate rules that constrain recruitment, compensation, power to contract, procurement procedures, etc.

When public bodies are established through the above seven principles, the environment is quite different. The public body has clear objectives. It has a board that is dominated by independent experts; decisions are not captured by insiders. All important decisions are made by the board under conditions of extreme transparency. Most important, the clarity of objectives generates accountability which prods the board forward towards performance.

Under these conditions, there is a case for much greater operational flexibility for public bodies on matters of human resource policies, contracting, financial rules, etc. If a HR policy document is debated and approved by the board, under conditions of full transparency, this is likely to be an HR policy document that is well suited to the ground realities faced by the organization in fulfilling its objectives.

High performing public bodies are those which feature a blend of high clarity of purpose, precise and limited powers, high accountability mechanisms, high independence and high operational flexibility. These

features should be seen as a package deal. Independence and operational flexibility are an essential feature of performance by public bodies but only when powers are limited, and there is strong accountability for a clear objective.

Principles pertaining to use of private Agents

When feasible, private Agents are best

As a general principle, when the Agent can be a private firm, this is always better than having a public body as the Agent, as the problem of public administration ends once a high quality contract is arrived at. A complex contract is required which gives revenues to the firm in a way that is sensitive to its performance. Apart from that, there is no complexity in the internal management of the firm. On the other hand, when the Agent is a public body, the problems of public administration have shifted but not been solved.

For certain problems the Agent can only be a public body

When the Agent has to be empowered to use the coercive power of the State (e.g. financial regulation) it is difficult to place this in a private firm. When this is done (e.g. with exchanges that perform regulation and supervision roles), it needs to be accompanied by strictures on the ownership and governance of the Agent. Another example is a contracting function such as that performed by NHAI. It is hard to design an incentive-compatible contract through which the contracting function can be placed upon a private Agent.

When the Agent is only required to perform certain service functions (e.g. operating a road, distributing electricity, teaching in a classroom), where coercion is not required, and the outcome is easily measured, the Agent can generally be a private firm.

Conclusion

The defining problem in India is that of constructing State capacity.

The present structures of the Indian State are a palimpsest of a colonial memory overlaid by a socialist objective overlaid by the pressures of participatory democracy in a market economy. In order to construct State capacity, it is important to take three steps back from the present arrangement and apply eight principles as discussed in the article.

The application of these principles will focus on the work of departments and ministries of government upon political objectives and upon legislation. Departments would identify sub-problems that can be contracted out, either to a public body or to a private firm. The focus would be on drafting high quality legal instruments, either executive orders (for creation of non-statutory public bodies) or laws (for creation of statutory public bodies) or contracts (with private firms). Once this contracting-out is done, the Agent would have considerable flexibility in pursuing well specified technical (not political) objectives, and be held accountable for delivering outcomes.

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Developing Countries, Agriculture and the World Trade Organization

J P Singh



...these new issues must be reckoned against the growing share of the developing world in international trade both in traditional merchandise, such as agricultural products, but also in high-technology driven services. In such cases, the developed world can neither exclude nor be preachy towards the developing world. The number of positive options for the developing world to participate effectively in the international trade system continues to increase

INTERNATIONAL TRADE remains robust despite the slow-down in the global economy since the 2008 financial crisis. Global merchandise exports in 2012 were \$17.3 trillion and the developing world accounted for 42 per cent of these exports. Exports outstripped production: world Merchandise exports grew by 3.5 per cent annually in the 2005-12 period, while world merchandise production grew by 2.0 in the same period. India fared even better: total merchandise exports grew 10.5 per cent annually in the 2005-12 period although the year 2012 did register a negative growth of -0.5 per cent .

High technology and services are often regarded as growth drivers for the global economy. Nevertheless, 'down-stream' commodities such as agriculture products and clothing continue to be salient in their own right, and may even benefit from revolutions in technology. Agriculture benefits from provision of infrastructural services such as transportation and banking, and clothing industry is revolutionized with computer aided design and manufacturing. Agriculture made up 9.2 per cent of global merchandise exports in 2012 and

agricultural exports grew by 10 per cent annually in the 2005-12 period (WTO 2013: 60-61). India is the eighth biggest exporter of agricultural products, including the United States and the European Union. The annual per cent age rate increase in India's agricultural exports was 22 per cent and India accounted for 2.6 per cent of total world agricultural exports in 2012. Agriculture is not only an important export commodity but also one growing alongside India's well-known comparative advantage in services exports.

Agricultural exports offer unique opportunities to developing countries, including India, but they also pose important challenges in balancing domestic and international priorities and pressures. Three are discussed below. First, there are challenges to prioritizing agriculture in increasingly diversified domestic economies. Second, the essay turns to the difficult domestic political economy of agricultural trade policy, keeping in mind the role of participation and consultation among diverse stakeholders. Third, the essay discusses the political economy of global challenges including international negotiations and developed country protectionism. Countries like India must strike a careful balance between being services versus agricultural

The author is Professor of Global Affairs and Cultural Studies, and Distinguished Senior Fellow at the School of Public Policy at George Mason University, USA. He has authored a number of books and scholarly articles on global political economy focusing on issues of global governance and development, cultural economics, socio-economic impact of information technologies, and global diplomacy and deliberations. Professor Singh has also advised international organizations such as UNESCO, the World Bank and the World Trade Organization.

Table 1
Growth in the Volume of Merchandise Exports and Production, 2005-2012

	2005-12
World Merchandise Exports	3.5
Agricultural Products	4.0
Fuels and Mining Products	2.0
Manufactures	4.0
World Merchandise Production	2.0
Agriculture	2.0
Mining	1.0
Manufacturing	2.5
World GDP	2.0
India: Growth in Exports	10.5
India: Growth in Imports	13.5

Source: World Trade Organization, *International Trade Statistics, 2013*. Geneva. Page 19

exporters, and challenging developed world protectionism while addressing demand to liberalize their own markets in agriculture.

Economic Diversity, International Trade and Agriculture

The World Trade Organization and its predecessor, the General Agreement on Tariffs and Trade (GATT), were founded post World War II to increase global trade and make it rule-based. Nevertheless, GATT was an agreement among great powers such as the USA and UK and despite their membership, excluded the voices of the developing world.

The historic position of the developing world in international trade was to seek price supports for its

agricultural products, to guard against price decreases and ‘infant industry’ protections to allow growth for its manufacturing industries. The chief export from the developing world was agricultural products but poor countries often faced declining terms of trade due to the price elasticity of agricultural products, higher exports did not necessarily result in bigger earnings due to falling prices. The economist Jagdish Bhagwati (1958) called this phenomenon “immiserizing growth” where the falling terms of trade negatively impacted the overall growth rate. Furthermore, expensive imports drained foreign exchange reserves even as the developing world undertook import substitution industrialization to produce similar or substitute products domestically.

The agricultural profile of the developing world was thus checkered with either falling terms of trade or dependent upon preferential access in the developed world. Preferential access, begun initially as extension of colonial commodity networks, became almost synonymous with agricultural exports from the developing world. The current groups known as African, Caribbean and Pacific (ACP) countries is heavily dependent upon preferential access for its agricultural products. Over time, this guaranteed preferential access has not allowed for production efficiencies and diversification and many ACP countries now often face competition from other developing countries that want these special protections ended. Ecuador thus fought successfully against the European Union preferential access for bananas chiefly from ACP countries in the early 2000s resulting in a final victory through dispute settlement at the WTO in 2005.

The current rise in agricultural exports from the developing world mentioned above must be understood in a slightly different context than the old trading system of preferential and duty-free access. First, the top agricultural exporters from the developing world include countries that have either challenged the old protectionist system of preferential access (such as Brazil), or countries that are now part of free trade coalitions in agriculture such as Argentina in the Cairns Group of agriculture named after a group of 19 developed and developing countries that met in Cairns, Australia in 1986. The second feature of the new agricultural profile is that many developing countries have already successfully diversified into industrial and services products, while being agricultural exporters.

India’s case as a leading agricultural and services exporter is illustrative. At GATT’s Uruguay Round of trade talks (1986-94), India initially opposed the services liberalization agenda that the U.S. and Western Europe proposed (Singh 2008). However, the General Agreement on Trade in

Table 2
Share of Agricultural Products in Trade in Merchandise by Region, 2012

	Exports	Imports
World	9.2	9.2
North America	10.9	6.6
South and Central America	27.4	8.6
Europe	10.3	10.1
Commonwealth of Independent States (CIS)	8.2	12.2
Africa	9.1	16.2
Middle East	2.2	12.6
Asia	6.8	8.7

Source: World Trade Organization, *International Trade Statistics, 2013*. Geneva. Page 61

Table 3
Leading Exporters of Agricultural Products
 (billion dollars and per centage)

	Value	Share in World Exports	2005-12: Annual per centage Rate
European Union (27)	613	37.0	7
Extra-EU (27) exports	163	9.8	10
United States	172	10.4	11
Brazil	86	5.2	14
China	66	4.0	13
Canada	63	3.8	6
Indonesia	45	2.7	18
Argentina	43	2.6	12
India	42	2.6	22
Thailand	42	2.5	13
Australia	38	2.3	9
Malaysia	34	2.0	14
Russian Federation	32	1.9	12
Vietnam	25	1.5	19
New Zealand	24	1.4	9
Mexico	23	1.4	9
Above 15	1349	81.4	

Source: World Trade Organization, *International Trade Statistics, 2013*. Geneva. Page 67

Services (GATS), which emerged from the negotiations, proved beneficial to India's services exports ranging from offshore services, audio-visual (Films and Television), Tourism, to telecommunications. (Tables 4 & 5). As the sixth largest services exporter, with 3.32 per cent share of total world exports in services, India seems to have leapfrogged from an agricultural to a services economy without sacrificing agriculture, which continues to be important in its trade profile.

In the immediate post-colonial era, the developing world had few export options and relied almost entirely on preferential access for its agricultural products. The current era is different; many countries from the developing world now have a comparative advantage in manufactured goods or services. Competitive agricultural exporters from the developing world must also be distinguished from those that rely heavily on preferential access (APC), the free-trade oriented Cairns group fighting against agricultural protectionism in the developed and developing worlds, and the "in-

between" countries like India that possess comparative advantage in a few agricultural commodities but also have huge protections in place for their domestic agriculture.

Political Economy of Agriculture and Trade Policies

The political economy of agriculture generally features intense lobbying and complex politics given the size or entrenchment of agricultural lobbies in various countries. The strength of the cotton or the sugar lobbies in the United States explains the subsidies these sectors receive in successive farm bills. Empirical analyses tend to show that as countries become developed, they switch from taxes on agricultural exports to subsidizing them. The welfare costs of tariffs and subsidies in agriculture are substantial and estimated to be between \$100 billion to \$300 billion per year by 2015 (World Bank 2007: 103). Trade liberalization would increase agricultural prices by 5.5 per cent. Developing countries, in particular, maintain the lower prices for various reasons: food security,

rural livelihoods, rural employment, or plain old protectionism. Nevertheless, higher prices would also benefit developing world exports such as cotton from West Africa that cannot compete with the subsidized U.S. cotton.

Trade policies for agriculture in the developing world followed historical patterns such as imperial preferences for colonial era products. Furthermore, senior bureaucrats from trade or finance ministries generally shaped other policies at the central government level. In most parts of the developing world, agriculture was given a second place to industry in the post-colonial era. As noted above, industry was emphasized. There was even suspicion that advice from developed countries such as the U.S. to emphasize agricultural production was designed to keep India poor (Das 2000: 128).

Prime Minister Jawaharlal Nehru declared in 1957: "Now India, we are bound to be industrialized, we are trying to be industrialized, we must be industrialized." It was not until the fall in ruling party's support starting in the late 1960s that agricultural was reprioritized, albeit now the Green Revolution helped with productivity.

In the current era, balance among industry, services, and agriculture sectors is necessary for strategizing trade policies. This is difficult for pluralist countries such as India facing pressures from various constituencies. India now has comparative advantage in agricultural products such as meat, oilseeds, rice, sugar, and tea but the growth drivers also lie elsewhere in services and industry. Striking the right balance can be hard with more than two-thirds of the national employment in agriculture.

The story of consultations in India for agricultural trade policy before the launch of the Doha Round of trade talks at the WTO in November 2001 is instructive. At the conclusion of the Uruguay Round, many state governments filed a protest and even a petition in the Supreme Court arguing

Table 4
India: Trade in Commercial Services
 Billions dollars and percentage

	Value	Share		Annual per centage Change
		2005	2012	2005-12
Transportations Services	17.1	1.0	1.9	17
Travel	17.8	1.1	1.6	13
Other Commercial	103.8	3.1	4.4	15

Source: World Trade Organization, *International Trade Statistics*, 2013. Geneva. Pages 144-15

that the central government had no authority to negotiate an agreement on agriculture as this was a state subject. Therefore, prior to the Doha Round the central government initiated consultations among ministries and various levels of government and civil society. At the central government level, these included the Ministry of Commerce and Industry (MOCI), the Ministry of Agriculture (MOA), and the Ministry of External Affairs (MEA). The central government also executed several regional or state-level consultations with politicians and farmers and brought in civil society and think-tank experts. What emerged was something startling: contrary to the prior thrust toward protectionism, these consultations also revealed that India did not only have defensive (protectionist) interests but also competitive (offensive) interests (Priyadarshi 2005).

An interesting example of stakeholder participation and balancing various interests also comes from Argentina. Prior to the Uruguay Round, Argentina initially joined several developing countries in seeking protections on agriculture and opening markets in industry. Consultations,

however, demonstrated to trade officials that Argentina's comparative advantage was in agricultural products such as beef exports and the country joined the Cairns Group in 1986.

Involving stakeholders in trade policy formulation is laborious and can deepen divisions after they voice their concerns. Equally, though, the consultations can point out unexpected developments and also help to inform the participants about difficult choices that policymakers must make at the global level.

International Negotiations and the WTO

Global negotiations are often called two-level games. Level I international negotiators must also negotiate and keep in touch with level II domestic constituencies, often through complex chains and relays (Putnam 1988). Organizations like WTO are often vilified for ignoring grassroots pressures but this could be equally true of level I negotiators who are supposed to represent these pressures. The last sub-section attended to level II pressures. This section turns to level I negotiations

Table 5
India: Rank in World Trade

	Exports	Imports
Merchandise	19	11
Excluding intra-EU trade	14	7
Commercial Services	6	7
Excluding intra-EU trade	4	5

Source: World Trade Organization, Country Profiles: www.wto.org/statistics

The developing world has employed a number of negotiation tactics effectively at the WTO to address complex pressures and trade-offs. First, it has argued collectively through various types of coalitional strength (WTO 2014). Apart from the APC coalition mentioned earlier, coalitional pressures have come from countries like India and Brazil at the G-20 meetings in a forum that extends beyond trade negotiations. India's stance backing heavy subsidies for food security at WTO's Bali negotiations in December 2013 received support from coalitional groups such as the G33. More recently, though, the Cairns group has also criticized countries such as India for trade distorting subsidies in agriculture, which the group argued rose from \$8.2 billion in 2001 to \$37.6 billion in 2008 (*Financial Times* 2014). Second, the developing world has sought institutional linkages and trade-offs in international negotiations. Often this has involved opening markets for services and industry for agriculture but more recently, it has also involved trade-offs within agriculture on particular products.

Future of Agricultural Trade Policies

Agricultural trade policy is now far more complex than developing countries merely facing immiserizing growth through trade, or the subsidies and high tariffs existing only in the developed world. Agricultural trade liberalization must be balanced against various needs inside and outside of the agricultural sector (Ingo and Nash 2004). The era of viewing agricultural trade liberalization as a universal evil or strength may be over.

Carefully calibrated agricultural trade policy from the developing world entails participation and consultations at the domestic level and use of effective negotiations tactics at the global level. Participation does not resolve the political fights at home but it allows stakeholders to glimpse the difficulties politicians face and, in the

best of circumstances, to suggest ways that allows trade policy to move forward.

At the international level, the developed world will not readily grant access to its agricultural markets. If anything, facing pressures from the developing world has made the developed world turn to preferential trade agreements where it can either exclude the developing world (as in the ongoing U.S.-EU Transatlantic Trade and Investment Partnerships) or the series of bilateral accords involving a developing country where it has fewer negotiation options against a developed country.

Nevertheless, these new issues must be reckoned against the growing share of the developing world in international trade both in traditional merchandise, such as agricultural products, but also in high-technology driven services. In such cases, the developed world can neither exclude nor be preachy towards the developing world. The number of positive options for the developing world to participate effectively in the international trade system continues to increase.

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Child Poet Innovates a Machine to Clean Rice without Hassle

Mohd. Sajid Ansari

T“AMANNA AAPKI is kadar poori ho jaye, Ki sapno ki duniya haqueeqat ho jaye, Ho aapka muqaddar itna roshan, Ki aameen kehne se pehle har dua kabool ho jaye.”

Sajid (15) is a sensitive and compassionate child. Seeing his mother hassled while cleaning rice every day, he thought of making a device to help her. His automatic electric machine separates broken rice grains and other physical impurities from unbroken rice grains.

An uphill task

While getting the idea was easy, putting it together was not. Sajid wondered what kind of machine could do this work. He had his eureka moment a few days later while at a flour mill. He was fascinated by the machine's rhythmic motion where wheat grains fed from the top were ground into flour that accumulated at the bottom. Watching the 'atta chakki', he visualized another machine where rice put in from the top comes out cleaned from the bottom.

“I was excited because I now knew what to do. But I was not sure if I could make such a machine with my limited knowledge of science,” he shares. Money was also a problem. Their only income came from his father's mobile tailoring shop, which was essentially a sewing machine placed on a pushcart. It was just enough to support a family that also included Sajid's younger sister and an elder brother who was mentally challenged.

Making the Rice Cleaner

But these difficulties did not put

him off. Inexperienced but full of optimism, he set about making the rice cleaner. To save costs, he picked up used parts from a neighbourhood scrap shop.

The biggest challenge was getting the correct motion for separating the impurities from the rice. He chuckles



as he recalls, “I first used four motors of 12 volts each and connected them directly to 220 volts. But all the motors burnt out. I realized that they were too weak for the power supply. So next time I used eight motors, reasoning that if four people cannot lift the weight, why not use eight!” Of course, these also burnt until addition of a transformer finally got the system running. Many changes and trials later, the rice grain cleaner was ready for testing. It was a working model that used electricity to separate physical impurities from rice. It could clean up to three kilograms in an hour. Presenting the machine to his mother was an emotional moment for him. “My mother just could not believe

it until she herself saw the machine working. My family and neighbours knew I was trying something, but no one paid any attention till it was ready. So everyone was excited to see it in action,” he mentions.

Around this time, Sajid came to know of IGNITE competition organized by NIF. He entered and won an award for the rice grain cleaner. At the award function, everyone was charmed with his poetic skills. NIF facilitated development of a compact prototype of the rice grain cleaner through a design institution. This was also showcased at the Innovations' Exhibition organized by NIF at the Rashtrapati Bhavan in 2012, where it was highly appreciated. A patent application (1075/KOL/2011) in Sajid's name has also been filed by NIF.

Poetry Opening Doors to Education

While performing at a state function, he recited an emotional poem on education. It moved the Governor sufficiently to secure his admission in a well-known school in the area on full scholarship. The poem went something like this:

Jab Hum Padenge, Aage Badenge,
Zile ka naam roshan karenge,
School mein papa naam likha deejaye,
Bujhe hue deep ko jala deejaye,
School mein papa naam likha deejaye.

His next project is a machine that will make easy the otherwise tedious manual process of sifting sand used in construction. His father feels confident that his son will go on to do much bigger things.

Corrigendum

In the May issue of Yojana, on the cover page, the correct spelling of the name of the author of the special article is Bharat Ramaswami. In the article 'Composite Development Index; An Explanatory Note' by the author, a paragraph had been left out. The article may be read in conjunction with the paragraph: “The purpose of this article is primarily expository. I served as a member of this committee and I found that a superficial familiarity was the source of much criticism. So my hope is that this note will serve as the basis for more informed critiques.” The error is regretted.

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Indian Agriculture – A Review of Policy and Performance

C S C Sekhar



India managed to attain food self-sufficiency through a combination of technology-policy-institution framework. However, other functions of agriculture, namely providing surpluses and forward and backward linkages to non-agricultural sectors have largely remained unrealized.

A policy reorientation to increase rural industrialization and skill improvement of the rural labour force is needed to move labour out of agriculture and increase productivity in agriculture. A better access of farmers to input and output markets, technology and rural infrastructure are needed

IN THIS essay we analyze Indian agricultural policy and its effect on agricultural growth over time. First the analytical framework is presented followed by a detailed account of policy evolution and growth performance.

The evolution of Indian agricultural policy may be analyzed in the context of the role of agriculture in the development process and the factors affecting agricultural growth. In the development process of a country, agriculture serves mainly three functions i) to provide initial surpluses for other sectors of the economy ii) to provide wage goods to the industrial sector iii) to promote growth through forward linkages (provide inputs to industrial sector) and backward linkages (use outputs from industrial sector in agriculture). The first and the third functions require a robust overall agricultural growth whereas the second requires adequate food supplies. Therefore, for sustained economic growth, both overall agricultural growth and growth in food production are indispensable.

Factors that affect agricultural growth can be broadly categorized into the following – natural (climatic),

technological, economic, institutional and policy factors. (For a debate on policy versus technology fatigue, see Narayanmoorthy (2007), Behera and Mishra (2007) Agricultural development depends on an inter-play of all these factors. Natural factors include soils, rainfall and temperature among others. Technological factors include seeds, machinery, pest-protection and fertilizing technology available in the country. The third set of factors is economic in nature. Profitability of agriculture vis-a-vis other sectors influences private investment in agriculture and similarly relative profitability of different crops determines the inter-crop allocation of land and other resources. The fourth set of factors is institutions – which is a much less-understood concept. Institutions include both formal (created by the law or de jure) and informal (de facto) rules of the game that determine interaction among the economic agents. The Food Corporation of India (FCI), which carries procurement operations and the village level moneylender who provides basic credit to the farmers can be thought of as two examples of formal and informal institutions respectively. Institutions are the main determinants of transaction costs.

The last set of factors relate to policy, which can influence almost

The author is Associate Professor at the Institute of Economic Growth, Delhi with research interests in agricultural markets, price formation, international agricultural trade and political economy & governance. He was earlier a Fulbright-Nehru Senior Fellow at Iowa State University, IA, USA and was also associated with ICRIER, Delhi. He has contributed research papers to prestigious national and international journals. He is also a consultant to international organizations such as UNCTAD, IFPRI and OXFAM.

all the above mentioned factors. For instance, large investment by the state in rural public goods such as rural roads, rural electrification and markets will change economic incentives in favour of agriculture by making agriculture remunerative. Liberal policy on tenancy laws will make land leasing easier and allow unviable farms to be leased out. This may increase flow of technology into agriculture. Increase in agricultural R&D investment and other public spending will have similar positive effects in promoting agricultural growth. Therefore, policy can influence all other factors, except natural factors.

Indian Agriculture in the Last Six Decades

The evolution of agricultural policy in India can be broadly categorized into five phases. The first phase is from 1951 to 1965 when

Promoting industrial growth through import substitution and protection through over-valued exchange rates was the broad strategy. Food requirements during this phase were largely met through PL-480 imports from the USA. Some investments were made in agricultural infrastructure, irrigation and electricity. The major source of agricultural growth during this period was area increase without notable productivity gains.

the main emphasis was on industry with limited focus on agriculture. The second phase (1966-1981) was the phase when green revolution technology or HYV technology was introduced and adopted in a major way in the country. India attained food self-sufficiency during this phase through a combination of technology, appropriate policy framework and suitable institutions. The third phase covers the period from 1981 to 1991 when the green revolution technology spread throughout the country resulting

in more equitable inter-regional growth. Growth in public investment in agriculture started slowing down in this phase. The fourth phase starts with 1992 with the launch of the macro-economic reforms and spans until 2004. This was the phase when anti-agricultural bias was reduced through correction of the over-valued exchange rate regime. There was also an attempt to reduce state's role in agriculture. The decline in public investment in the earlier phase began to affect agricultural growth adversely in this phase. The final phase is from 2005 when state's role in agriculture increased and many programs were launched.

In the first phase (1951-1965), the planning was mainly marked by industrial growth-led development strategy. In the first three five year plans, industry was the main plank of planning and agriculture received little attention. Promoting industrial growth through import substitution and protection through over-valued exchange rates was the broad strategy. Food requirements during this phase were largely met through PL-480 imports from the USA. Some investments were made in agricultural infrastructure, irrigation and electricity. The major source of agricultural growth during this period was area increase without notable productivity gains.

During the second phase (1966-1980), with major food shortages in the 1960's and the subsequent disruption in food aid supplies under the PL-480 programme of the United States, food self-sufficiency evolved as a major goal of policy planning. Since the major objective was to increase food production in a short span of time, efforts were mainly focussed on the high potential regions in the irrigated pockets of the country. Inputs such as irrigation, fertilizer, power and credit were subsidized. Provision of output support in the form of minimum support price (MSP) was started. Also, procurement by the public agencies was begun to ensure assured market to the

farmers and supply of grain through PDS to poor consumers. Food trade was severely restricted to provide incentives to domestic production. Many important institutions such as Agricultural Prices Commission (APC) which is now known as CACP, Food Corporation of India (FCI) and National Dairy Development Board were also established during this time. Large investments were also made in agricultural R&D. These policies were immensely successful and by the mid- seventies India had

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become virtually self-sufficient in the production of food grains and impressive gains had been made in the production of milk and sugar. The major source of growth during this period was increase in productivity.

This supply-demand-institutional framework, built during mid 60s, continued till early 1990s with minor changes. Results of this policy regime are mixed. The supply side policies have resulted in decent agricultural growth and helped India achieve food self-sufficiency (Table 1). But, the focus on well-endowed regions resulted in inter-regional disparities in growth. Policies on the consumption front – buffer stocks and PDS – ensured a steady supply of food at affordable prices to large sections of population. The biggest achievement of these policies can be said to be the

complete elimination of large-scale famines due to natural (droughts) or man-made (failure of distribution network) causes.

The third phase (1981-1991) saw the spread of HYV technology to regions other than north-west India. This period is the best phase of Indian agriculture as growth was achieved with inter-regional equity. With self-sufficiency in food grains, focus shifted in this phase to oilseeds and pulses in which growth had lagged behind. Technology Mission in Oilseeds and Pulses (TMOP) was started in 1986. These policy initiatives resulted in very impressive increase in production of oilseeds. However, the costs of this increase were quite substantial in terms of resource use inefficiency as indicated by resource cost ratios much in excess of 1 for major oilseeds. Production of food grains continued to rise and control of food trade and operation of the public distribution system continued during this period.

The fourth phase (1992-2004) is marked by the launching of macro economic reforms in 1991 and import liberalization in edible oils sector in 1994. This phase can be further subdivided into two sub-phases 1992 to 1997 and 1997 to 2004. In the first sub-phase, the macro economic reforms resulted in reduction of the anti-agricultural bias. The second sub-phase witnessed a sharp decline in agricultural growth, as a result of the reduction in capital investment and decline in farm profitability. The anti-agricultural bias decreased considerably since the early 1990s. This is mainly because of a steady decline in the manufacturing protection and correction of the exchange rate regime as a result of macroeconomic reforms. The peak tariffs on industrial products came down from 300 per cent in 1991-92 to 30 per cent in 2002. Similarly, import controls were withdrawn in 1991-92 virtually on all goods. One of the effects of these structural adjustment measures was

improvement in the terms of trade (ToT) for agriculture. The index of terms of trade (1990-91=100) remained above 100 during the entire period since 1990 (Agricultural Statistics at a Glance, 2011). As a result of this improvement in the ToT private sector gross capital formation in agriculture (GCFA) increased from 11424 crores in 1990-91 (1993-94 prices) to 14931 crores in 2000-01. The rate of growth in 90s (2.5 per cent) was also higher than in the 80s (2.0 per cent). While the improvement in ToT, had a slight positive effect on private investment in agriculture, rising fiscal deficits, on the other hand, contributed to a decline in public investment. The public investment of 7130 crores in 1981-82 fell to 4992 crores in 1990-91 and further to rupees 4520 crores in 2000-01. As a result, development of infrastructure like irrigation, rural electrification, rural roads and markets suffered. This decline showed very adverse effect on the performance of agriculture in the country in the 1990s. The average growth rate of agricultural GDP fell to 3.1 per cent in the 1990's (1991-92 to 2001-02) as compared to 3.5 per cent during the 1980s (Table 1). The growth rate of production of principal crops has come down from 3.19 per cent per annum during 80s to 2.28 per cent in 90s.

This continued neglect of public investment in agriculture started manifesting in the form of a severe

crisis by the late-1990s (see Chand et al. 2007). The average growth rate of agriculture during the pre-green revolution period (phase 1) was 2.1 per cent, which accelerated to 3 per cent and 3.5 per cent respectively in the next two phases. However, the growth rate fell drastically to 2.2 per cent during 1997-2004, which was almost equal to the pre-green revolution phase. Ironically this was the period when non-agricultural GDP was growing at 7 per cent per annum, leading to large inter-sectoral disparities. This slowdown in agriculture was mainly because of sharp deceleration/decline in public investment and input usage in agriculture, which is linked to decline in profitability of most crops. The complementarity between public investment and private investment as well as input usage, led to this severe crisis in agriculture.

What can be said about the success of India's agricultural policies upto this point? India's performance overall was undoubtedly impressive. Food grain production increased manifold and the country turned from being a net importer in 1951 to a net exporter in 2013. Irrigation increased from 11 per cent (of net sown area) to 45 per cent during this period. Fertiliser consumption rose from negligible quantities to 141 kg per hectare during the same period. Before mid sixties, increase in acreage was principally responsible for the increase in production. After the green revolution, the increase in yield was

Table 1
Average Growth Rates of Agri-GDP and GDP at Factor Cost

Periods	Agri-GDP	S.D.	GDP	S.D.
1951-52 to 1965-66	2.15	5.25	3.58	3.16
1966-67 to 1980-81	3.03	7.59	3.66	3.88
1981-82 to 1991-92	3.45	5.15	5.04	2.43
1992-93 to 2004-05	3.14	3.99	6.18	1.43
2005-06 to 2011-12	3.89	2.42	8.46	1.42

Source: Economic Survey 2012-13

Note: 1) The growth rates are averages of annual growth rates.

2) S.D. refers to standard deviation of the growth rates

substantial and across the board for all crops. The biggest achievement is the virtual elimination of large-scale famines in the country.

On the negative side, the subsidies on power, fertiliser and food grew rapidly. This current expenditure on subsidies led to decline in public investment in agriculture. As a result the gross capital formation by the public sector in agriculture declined sharply after 1980. Inter-regional and inter-sectoral disparities widened over time. Farming became unviable and a severe crisis ensued from 1997. The major limitation of the growth process is that the country could not achieve universal economic access to food even three decades after the country became self-sufficient in food production.

Recent Initiatives

In the last phase (2005-2013) few efforts have been made to address these issues – arresting the decline in investment in agriculture, making farming viable and improving farmers’ income, increasing food production and providing economic access to food to large sections of population.

Rashtriya Krishi Vikas Yojana (RKVY) was started in 2007 mainly with the objectives of incentivizing states to increase investment in agriculture (because agriculture is a state subject) and use this investment to address felt-needs of the farmers. To meet these two objectives, it has been made mandatory for states to maintain or increase their trend growth in expenditure on agriculture (as a proportion of total expenditure), and also make district agricultural plans (DAP) through a bottom-up planning process for the entire state. States have to meet both these requirements to be able to access RKVY funds. The initial results show improvement in the growth rate of GCFA after the program as compared to the preceding period. The agri-GDP growth rate has also been higher and more stable during this period (Fig 1 and Fig 2). However, people’s participation in

preparation of district agricultural plans has been minimal.

The second major program is aimed to increase food production by the end of the 11th FYP. The National Food Security Mission (NFSM) was launched in 2007 with the limited objective of increasing the production of rice, wheat and pulses by 10, 8 and 2 million tonnes respectively by the end of the 11th FYP. The program, like the green revolution period, focused on select districts across the country for each crop. Results indicate that the program has managed to achieve the targeted production for each of the crops.

The third programme is the National Food Security Act (NFSA), with the main objective of providing economic access to food. Under this program an entitlement of 35 kg of food-grain per month per AAY household and 25 kg per month per priority household (to be decided by the state governments) at a price of 3/2/1 for rice/wheat/millet for three years have been created. In all, about 75 per cent of the rural and 50 per cent of the urban population is covered. Another feature of the program is provision of other benefits such as maternal and child support, support to destitute and homeless. The main concerns about the program relate to

Figure 1

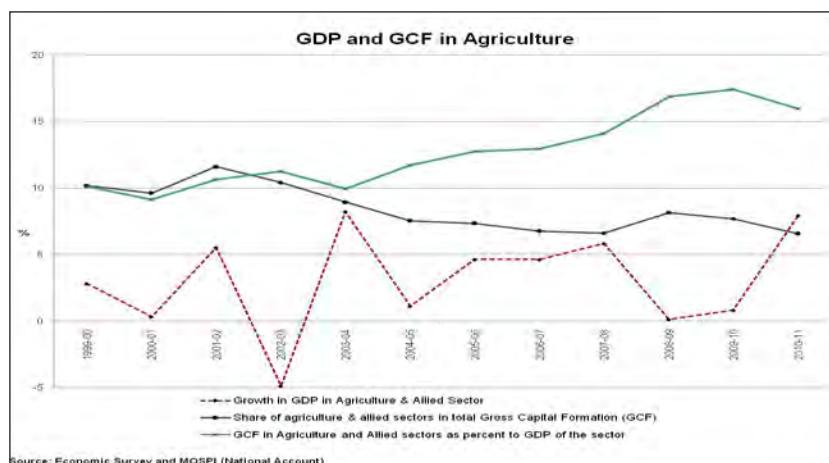
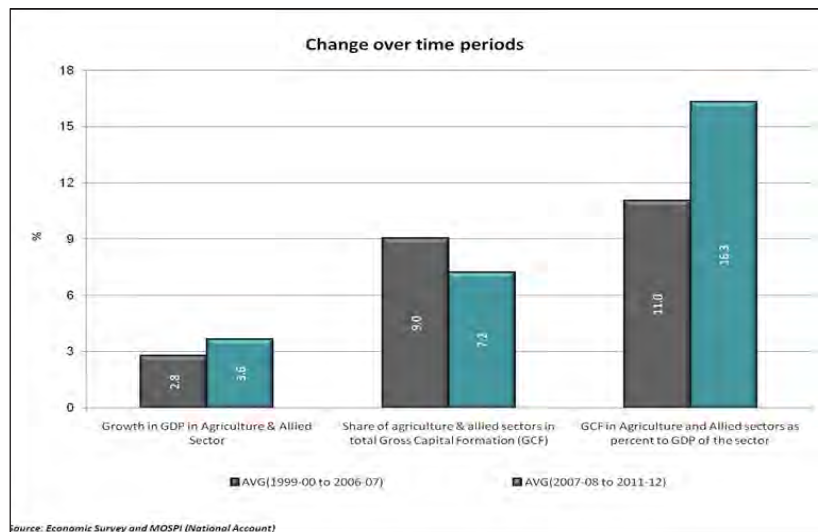


Figure 2
Capital Formation in Agriculture and Agri-GDP Growth:
Before and After RKVY



sufficiency of domestic production, level of procurement needed, likely impact on market prices, feasibility of imports in case of production shortfalls, level of subsidy outgo and inefficiency of PDS.

Recent studies suggest that the current levels of production and procurement are adequate to meet the requirements of the program. Also, the subsidy outgo is also only marginally higher. These studies also indicate an improvement in the PDS in several states (Khera 2011a and 2011b). However, the concerns about market prices appear valid in the light of the persistent cereal price inflation in the recent past. Also, viability of imports is open to question, given the market structure and uncertainty about food availability at affordable prices in the international markets (Sekhar 2008). This issue is very important for large countries like India.

Role of Policy and other Factors in Different Phases

In the first phase (1950-1964), agriculture was mainly driven by the natural factors. In the second phase (1965-1980), breakthrough in technology in the form of high yielding varieties helped the policy efforts by making the economics favourable to food production. The state also created formal institutions such as CACP, FCI and NDDB to implement these policies. Therefore, there was a perfect blend of economic-technological-institutional-policy factors in this phase, which resulted in the high growth performance witnessed.

In the third phase, the spread of HYV technology to other parts of the country ensured continuation of growth. However, there was no new technological breakthrough during this phase. As a result, the focus sectors during this phase – pulses and edible oils – witnessed growth mainly through state support without efficiency improvements. When the

state support was withdrawn to edible oil sector in the mid 1990s, growth performance slackened. There was another problem during this phase related to the capture of benefits by interest groups. The green revolution regions, which benefited from the initial state support in the 1960s, continued to exert pressure on the central government for continuance of support. This resulted in decline in public investment for agriculture, as resources were diverted to subsidies on food, fertilizer, power and irrigation. This crowding-out of public investment by the current expenditure on subsidies led to gradual decline in growth in the 1990s, eventually turning into a major crisis by 1997.

The subsequent debates and popular discourse on the decline in public investment and failure to attain economic access to food, led to corrective actions on the policy front. Civil society and media played a prominent role in this. The launch of RKVY, NFSM and NFSA are some of the results of this discourse. The attempt in these programs is to create the necessary institutional and policy framework to make agriculture viable to farmers and also to increase physical and economic access to food.

Conclusion

India managed to attain food self-sufficiency through a combination of technology-policy-institution framework. However, other functions of agriculture, namely providing surpluses and forward and backward linkages to non-agricultural sectors have largely remained unrealized. A policy reorientation to increase rural industrialization and skill improvement of the rural labour force is needed to move labour out of agriculture and increase productivity in agriculture. A better access of farmers to input and output markets, technology and rural infrastructure are needed. Initial results of the recent initiatives such as RKVY and NFSM appear satisfactory. These initiatives

may be supplemented by incentivizing private sector to invest more in agriculture. Although, National Food Security Act is beneficial to provide economic access in the short-run, more sustainable policies of improving rural incomes through livelihood security need to be adopted.

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Understanding Rape Law Reform

Pratiksha Baxi



This unprecedented moment of mobilisation and protest is by far one of the most important chapters in the history of political movements against rape. It is important since rape acquired a new critical discursivity, no longer confined to the conversations within the women's movement or amongst legal experts.

The protestors included loud voices of dissent, which named rape as an act of power, not sex. As a form of gendered and sexualised violence, rape and other forms of sexual assault, found powerful critique

KOWN VARIOUSLY *Nirbhaya*, *Braveheart* or *Damini*, the 23-year-old physiotherapist who died two weeks after the brutal gang rape in a moving bus in December 2012 inspired a mass scale movement against sexual violence. This unprecedented moment of mobilisation and protest is by far one of the most important chapters in the history of political movements against rape. It is important since rape acquired a new critical discursivity, no longer confined to the conversations within the women's movement or amongst legal experts. The protestors included loud voices of dissent, which named rape as an act of power, not sex. As a form of gendered and sexualised violence, rape and other forms of sexual assault, found powerful critique. This was a protest, which drew attention to the continuum of violence from the everyday forms of sexual harassment to the aggravated forms of sexual assault. The vocabulary of protest was not singular, changing its grounds as more voices debated about what needs to change in various sites of protests in real and virtual worlds. The protesters also critiqued the normalisation of "rape culture" or the institutionalisation of techniques,

which normalise rape and even celebrate sexual violence. They insisted that resisting law as rape culture means resisting the politics, which institutes public amnesia about the voices of suffering.

Retributive Public 1: Death Penalty

During the protests, we saw the emergence of many kinds of publics. There were many speeches and writing against the emergence of a retributive public, where the cry for death penalty or castration became a vocabulary of protest. While the demand for death penalty is a symptom of collective melancholia and anger, capital punishment does not help rape survivors. Many cases of rape and murder have been met with capital punishment, without producing any effect of deterrence. Judges are prone to mitigate the sentence, awarding lesser than the mandatory minimum sentence. Further, it is possible that far more women will be killed, mutilated, burnt or terrorised after sexual assault if all rape cases were to attract the death penalty.

The demand for death penalty rests on the idea that rape reduces women to living corpses, assuming that rape survivors are marked permanently by

The author is an Associate Professor at the Centre for the Study of Law and Governance, Jawaharlal Nehru University, New Delhi where she teaches sociology of law. Her research interests include sociology of law, gender studies, judicial reform and feminist legal theory. She has also been involved in public campaigns against violence against women in India. Dr. Baxi has recently published a book entitled *Public Secrets of Law: Rape Trials in India* (OUP, 2014)

shame and stigma. It participates in the social and juridical assumption that a raped survivor has no future, since no man would want to marry such a woman. To insist on death penalty because women are living corpses after rape means we deny women who survive such violence the means to live a life of dignity on their own terms. This is what the call for death penalty does. Rather than argue for death penalty, we must create safer conditions of testimony, protesting and speaking out.

There are several ways of tracing the genealogies of castration as a response to sexual violence, which mobilises public protest. Perfected in Nazi concentration camps, castration has historically been a fascist tool for eliminating the Jews, gays, gypsies, mentally challenged, in the name of “reforming” deviant sex offenders amongst other unwanted and despised populations.

Retributive public 2: Castration

Castration acquired a retributive currency not witnessed in earlier protests against sexual assault. How do we trace the emergence of castration as an alternative to death penalty or life sentence without parole or remission? State response to protests against sexual violence recommending forcible castration, whether physical or chemical, although each form produces different kinds of desiring and brutalised bodies, is regressive for a number of reasons. It is regressive since this form of punishment amounts to cruel and degrading treatment of incarcerated bodies, amounting to torture, as per international and constitutional law. Further, such forms of punishment legitimate mutilation of body parts by non-state actors, as a technique of punishment and terror. Most importantly, forcible castration does not displace the

desire to hate, maim, assault and/kill women. Such medicalization of punishment would have the effect of enhancing misogynistic violence, since sexual violence is not contingent on being biologically male or using the penis as a weapon. The idea that the penis is a weapon negates the material and symbolic realities of sexual violence. Rapacious men use sexualised violence to communicate a message to all women and some men—a language of communication violently coded in the expression “teaching a lesson”.

There are several ways of tracing the genealogies of castration as a response to sexual violence, which mobilises public protest. Perfected in Nazi concentration camps, castration has historically been a fascist tool for eliminating the Jews, gays, gypsies, mentally challenged, in the name of “reforming” deviant sex offenders amongst other unwanted and despised populations. In the Nazi regime if castration became the apparatus of terror to “cure” *aberrant* desires, it also offered an occasion for the police to label many more men as “aberrant”, to castrate them—creating a reign of sexual terror.

In India, the forgotten memories of forcible sterilisation during the Emergency haunt any call for forced castration. Emma Tarlo’s, *Unsettling Memories: Narratives of the Emergency in Delhi* critiques such states of emergencies, which destroy the reproductive futures of unwanted populations, creating in its wake terrible legacy of the state’s monopoly over the reproductive and sexed body. The political unconscious that raises the demand for castration in relation to sexual offenders represses, as Sophy Joseph reminds us of yet another genealogy by pointing out that texts such as the Manusmriti prescribed castration as a tool of humiliation and punishment of dalit men for sex with, or rape of an upper caste woman. If we trace the genealogy of the debate on castration to these texts, we find a clear articulation of what

castration meant for a phallogocentric and caste based response to sexual violence. For Brahmanical patriarchy, to use Uma Chakravarti’s term, the regulation of sexuality is central. Caste manifests its dominance and terror by normalising sexual violence on “lower” caste women, while assigning degrading punishment to “lower” caste men who may sexually assault upper caste women. Similarly, humiliating violence is visited upon those men and women, who transgress caste norms to have a sexual relationship, live together and/or marry. The political unconscious of castration as a form of punishment in a caste based patriarchy finds life in texts, which uphold and celebrate a phallogocentric caste order.

Prohibit the Two-finger Test in Rape Cases

Until the 2012-2013 protests, no government took seriously the several submissions to get rid of the

In India, the forgotten memories of forcible sterilisation during the Emergency haunt any call for forced castration. Emma Tarlo’s, *Unsettling Memories: Narratives of the Emergency in Delhi* critiques such states of emergencies, which destroy the reproductive futures of unwanted populations, creating in its wake terrible legacy of the state’s monopoly over the reproductive and sexed body.

colonial, sexist and violent practice of the two-finger test. Doctors routinely perform this test on the rape victim to figure out whether the hymen is distensible or not. This then leads to the inference that the rape survivor is habituated to sex, introducing past sexual history into rape trials. Past sexual history was disallowed in rape trials since 2003. However, the two-finger test by medicalizing consent allows past sexual history of the raped survivor to prejudice her testimony.

The Human Rights Watch report *Dignity on Trial* collated judgements, medical opinions and interviews with experts to recommend to the government that the two-finger test should be scrapped in 2010. There is no scientific basis to this test, since no doctor can determine whether or not a woman has a sexual history, unless she chooses to narrate her sexual biography. The two-finger test finds repetition in every other medico-legal textbook. These textbooks are used in courtrooms to discredit the survivor: “oh, she is habituated, she is lying about rape”: is a common refrain in trial courts. In 2013, the Supreme Court held that ‘medical

Crafted in the background of a sharp critique of the Ordinance, the public cry for death penalty and the unfolding trial of the Delhi gang rape accused, the Criminal Law Amendment Act of 2013 abandoned its commitment to making rape a gender-neutral offence. The Verma committee recommendations to make the category of the survivor gender neutral were rejected in favour of gender specificity of both survivors and perpetrators.

procedures should not be carried out in a manner that constitutes cruel, inhuman, or degrading treatment and health should be of paramount consideration while dealing with gender-based violence. The State is under an obligation to make such services available to survivors of sexual violence. Proper measures should be taken to ensure their safety and there should be no arbitrary or unlawful interference with his privacy. Thus, in view of the above, undoubtedly, the two finger test and its interpretation violates the right of rape survivors to privacy, physical and mental integrity and dignity. Thus, this test, even if the report is affirmative, cannot ipso facto, be given (*sic*) rise to presumption of consent’.¹ Although the Supreme

Court named the two-finger test as unconstitutional, the government did not ban it until March 2014. The national protocol now adopted by the Central government however will have to be adopted by the State governments.

The Criminal Law Amendment Act, 2013

Crafted in the background of a sharp critique of the Ordinance, the public cry for death penalty and the unfolding trial of the Delhi gang rape accused, the *Criminal Law Amendment Act of 2013* abandoned its commitment to making rape a gender-neutral offence. The Verma committee recommendations to make the category of the survivor gender neutral were rejected in favour of gender specificity of both survivors and perpetrators. This meant that violence against adult men and sexual minorities is not addressed in law. And later, the Supreme Court was to overturn the Delhi High Court judgement in *Koushal vs Naz* dealing a body blow to the jurisprudence of dignity.

The definition of rape was expanded to include other forms of non-penile penetrative sex in any body orifice without consent or against will—a radical departure from the 1983 amendment. The definition of consent was enlarged and it was specified that lack of marks of resistance does not amount to consent. The 2013 amendment now specifies that ‘consent means an unequivocal voluntary agreement when the woman by words, gestures or any form of verbal or non-verbal communication, communicates willingness to participate in the specific sexual act’, ‘provided that a woman who does not physically resist to the act of penetration shall not by the reason only of that fact, be regarded as consenting to the sexual activity’. This is a significant amendment.

Does this mean that rape (sexual assault is not a juridical category) is

no longer thought of as a crime of property (women being the sexual property of *their* men)? To an extent but not entirely : marital rape was not criminalised. Hence, rape of wives above the age of 15 is not a crime. The 2013 amendment recognised that rape of a separated wife is not limited to a situation where the wife is separated by juridical decree, as in the 1983 amendment. In other words, the rape law is not applicable to wives older than 15, although the child sexual assault law passed in 2012 (POCSO) is applicable to child wives between 15-18. The age of consent was raised to 18—this means that consensual sex between young adults between the age of 16 and 18 is now statutory rape. This raises concern about the use of the rape law to regulate consensual sex and relationships of love, which transgress caste and community norms.

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In 2013, newer categories of aggravated rape have been introduced. These include: rape by a relative, guardian, or teacher of, or a person in a position of trust or authority [s. 376 (2) (f)], rape of a woman during communal or sectarian violence [s. 376 (2) (g)], rape of a woman incapable of giving consent [s. 376 (2) (j)], rape of a woman when the accused is in a position of domination and control over her [s. 376 (2) (k)], when a woman suffers from a physical or mental disability [s. 376 (2) (l)], when grievous bodily harm is caused or the woman is maimed, disfigured or her life is endangered [s. 376 (2)

(m)], or she is raped repeatedly [s. 376 (2) (n)]. Further, the amendment defines as an aggravated offence, rape of children until the age of 16 [s. 376 (2) (i)], as compared to the earlier 12 years. Section 376 (2) (c) makes it an aggravated offence if any member of the army forces in an area deployed by the Central or State government commits rape on a woman in such area. Section 376 (2) (a) further holds that rape by police officers as an aggravated offence by specifying that such a rape will be considered aggravated when the crime is committed, within the limits of a police station to which

Forms of terrifying and mutilating sexual violence, which have been paradigmatic to the experiences of dalit and tribal women, seemed to have become the norm, and therefore, became one of the grounds for such widespread protest in 2012-13. However, the complex experiences of prosecuting rape and atrocity did not inform the debate on law reform.

the policeman has been appointed or in the premises of any station house or when the woman is in custody of such a police officer or his subordinate. The minimum punishment for these offences is ten years and the maximum extends to life imprisonment, where life means till the remainder of the convict's natural life. A new section 376 A was added which held that when rape causes death or the rape victim is reduced to a persistent vegetative state then a minimum of twenty years imprisonment with a maximum of life until the remainder of natural life or death may be awarded. Section 376 D enhanced the punishment for gang rape to a minimum sentence of twenty years, which may be extended to life imprisonment for the remainder of the person's natural life. This section specifies that the fine imposed should be sufficient to

cover the victim's medical expenses and must be paid directly to the victim. Section 376 E specifies that punishment for repeat offenders will warrant the life sentence for the remainder of the person's natural life or the death penalty.

Forms of terrifying and mutilating sexual violence, which have been paradigmatic to the experiences of dalit and tribal women, seemed to have become the norm, and therefore, became one of the grounds for such widespread protest in 2012-13. However, the complex experiences of prosecuting rape and atrocity did not inform the debate on law reform. Those ritualized forms of sexualized humiliation such as stripping and parading were not recognized as specific forms of historic wrong. Rather, following the Verma Committee Report, Section 354 B was inserted in the IPC which criminalized assault or use of force to compel any woman to be naked or disrobe her for a minimum sentence of three years and a maximum sentence of seven years. This new section however does not redress the specificity of the humiliation of being stripped and paraded in front of a public, which consumes such a degrading spectacle. Nor were further amendments to strengthen the prosecution of rape of dalit or tribal women under the PoA Act recommended during this time.

In 2013, Section 53 A was inserted in the Indian Evidence Act which states that the evidence of the character of the victim or of such person's previous sexual experience with any person shall not be relevant on the issue of consent or its quality. Further, Section 146 was amended to substitute the previous proviso which states that under sections 376, 376A, 376B, 376C, 376D and 376E IPC (or attempt to commit any of these offences) it shall not be permissible to adduce evidence or to put questions in the cross-examination of the victim as to the general immoral character, previous sexual experience

of the victim to prove consent or the quality of consent.

Until 2013, disability did not feature as a ground for amending laws of procedure and evidence. The 2013 Amendment inserted Section 54 A CrPC to specify that in case of a person identifying the accused is mentally or physically disabled, the process of identification will take place under the supervision of the Judicial Magistrate using methods the witness is comfortable with. Further, Section 154 which now holds that the first information given by a woman in rape cases should be recorded by a woman police officer or any woman officer, specifies that if the victim is temporarily or permanently mentally or physically disabled then such information shall be recorded by a police officer at the residence of the complainant or any other place

Until 2013, disability did not feature as a ground for amending laws of procedure and evidence. The 2013 Amendment inserted Section 54 A CrPC to specify that in case of a person identifying the accused is mentally or physically disabled, the process of identification will take place under the supervision of the Judicial Magistrate using methods the witness is comfortable with.

convenient to the complainant in the presence of an interpreter or special educator.

Concluding Remarks

The amended law was, however, unable to address the perplexing question of out of court settlements and hostile witnesses. The police, CBI, prosecutors, defence lawyers and other agencies of the state continue to terrorize rape survivors to "compromise" rape cases, leading to suicides, murders and acquittals.² The suicide of the 17 year old in Patiala in 2013 is an outcome of the terror of compromise—yet there is no attempt to investigate why women are forced

to compromise rape cases, when the law books clearly state that this is illegal. Although judgements only provide us frozen pictures of the nature of questioning directed at a rape survivor, appellate judgements in reporting trial proceedings reveal the pornographic structure of the rape trials. 27 years after the Mathura hearings, the sexual objectification of the body in rape trials finds shocking elaboration in a case reported by the Rajasthan High Court in 2007. During the cross-examination in a trial court in Jaipur district, the victim 'was asked as to in what posture she was raped. She was made to lie on the bench available in the trial Court to demonstrate her posture'. The rhetoric of judicial reform is cunning since it accommodates critique into the structure of the rape trial, without displacing its nature as a sexualized spectacle. Perhaps only a heightened intolerance for any kind of sexual violence as a social force will begin to chip away at the monumentalization of rape cultures in India? We must seek revolutionary transformation in every sphere to inaugurate new ethical and political meanings in our collective struggle against sexual violence. This means that we must source our vocabulary of protest from languages of suffering rather than languages of power.

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- 1 *Lillu @ Rajesh & Anr. v. State of Haryana* MANU/SC/0369/2013 at para 12-13
- 2 See *Sajina T. v. State of Kerala and Ors.* MANU/KE/0041/2008, *Vijay Sood v. State of Himachal Pradesh* MANU/HP/0132/2009. □

(E-mail:pratiksha.baxi@gmail.com)

NORTH EAST DIARY

NATIONAL HIGHWAYS IN ASSAM

The Government of India has declared six roads in the state of Assam as National Highways through a notification carried out by the Ministry of Road Transport and Highways. With this, Assam has now 3,600 kilometres of roads as National Highway with its total length increasing from 3,100kms to 3,600 kilometres. The 244 kilometre long Highway starts from its junction at NH 27 near Nelle (Amsoi Gate). It links Rajagaon, Doyangmukh, Umrangso, Khobak ending at NH 27 at Harangajao. It would provide an alternative road to Barak Valley. This highway has been declared as NH No. 627.

Similarly, the 85 kilometre long stretch starting from the junction at NH 27 near Howli links Barpeta, Hajo stopping at NH 27 near Jalukbari. This will be the new National Highway No. 427. A stretch of 52 kilometre starting from Manja linking Diphu and terminating near Lumding is now National Highway No.329. A 65 kilometre long road with its junction near Bilasipara will link Kokrajhar. It will halt at Garubhasa. It will be the new National Highway No. 117A.

The stretch of road starting at NH 27 near Nakhola connecting Jagiroad, Morigaon, Kaupati Rowta, Udalguri, Khoirabari and terminating at the border of India and Bhutan is now declared as National Highway No. 715A. This Highway will also have a bridge that will connect the two banks of river Brahmaputra. Presently, this Highway is 21 kilometre long and the remaining part is yet to be constructed. The 42 kilometre long Highway starting from NH 27 near Barama passing through Baksa, Subhankhata and ending at India Bhutan border is now the National Highway No.127E. All six highways will be constructed and maintained by the Central Government. □

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Deconstructing Social Protection

Anurag Priyadarshiee



..social protection programmes have the potential to alleviate suffering of a large population in poorer countries in the shorter run, while also contributing to overall human development in the longer run. The current challenge, according to them is to integrate a variety of programmes to address different issues associated with poverty at different levels simultaneously

SOCIAL PROTECTION or social security has become a buzzword among policymakers, particularly in low-income countries, engaged in designing

measures to reduce poverty. Justification of social protection is often premised on the argument that it may not be possible to address the structural causes of poverty within the prevalent political and economic environment of many low-income countries. Most important structural causes of poverty are associated with unequal distribution of factors of production, mainly, land and capital. Such unequal distribution results in poor facing a limited supply of the factors of production making it very difficult for them to participate in the process of economic growth. Poor are also unable to adequately access the health and educational infrastructure due to their assetlessness, and thus most often fail to build up their capabilities. The situation is compounded due to continued social exclusion and discrimination. Although a section of advocates of social protection acknowledge the structural causes of poverty, they also argue that absence of social protection measures and safety nets for the poor and vulnerable perpetuates poverty among them. As the policymakers find it infeasible to correct the distributional aspects of poverty in the given politico-economic

environment, they are increasingly realizing that availability of social protection measures may help in reducing the severity of the poverty situation to a large extent.

What Is Social Protection?

Social protection is generally described to include public actions taken in response to levels of vulnerability, risk and deprivation, which are deemed socially unacceptable within a given society. Such actions also include interventions and initiatives that enhance the social status and rights of the marginalised. Basic idea of social protection is to use social means to prevent deprivation, and vulnerability to deprivation. Social Protection thus, has a strong poverty focus. Social protection evolved in the late 1980s and early 1990s as a comprehensive set of programmes to respond to multidimensionality of poverty. Such a response also reflected an increasing recognition of the perceived inadequacy of social safety nets, which were criticised as 'residualist and paternalistic' (Sabates-Wheeler and Devereux, 2008: 64).

Various social protection measures are possible and need to be taken to reduce and mitigate such risks and vulnerabilities at the levels of individuals, households, and communities. Dreze and Sen (1991) argue that there may be two aspects

The author is currently working as Chief Operating Officer at International Development Enterprises- India (IDEI). He has worked at senior management positions with Government of India as a civil servant, a UN agency, and some of the world's most prominent voluntary organizations. He did his doctoral research at the University of Manchester, UK, that involved exploring ways and means to expand and deepen financial markets in India, and link them up with social protection.

of such measures; protection aspects that concern protecting the living standards and assume paramount importance at the times of social and economic shocks such as famines, and promotional aspects that aim to improve the general living standards and address deprivation and vulnerabilities. The objectives of one aspect may be very different from those of the other but the implementation strategies involving them may not be completely independent of each other. Moreover, the achievements in respect of one may feed into the other. For example, success with the promotional aspects may ease the implementation of protection aspects (for example, higher incomes may make individual insurance less painful). Sabates-Wheeler and Devereux (2008: 69) extend such classification to include the social protection

...the provision measures aim to reduce and mitigate deprivation, while the preventive measures attempt to prevent the incidence of deprivation and include various poverty alleviation measures. Promotive measures focus on improving incomes and capabilities 'through a range of livelihood-enhancing programmes targeted at both households and individuals'.

measures in four categories, namely, provision, preventive, promotive and transformative measures. According to them, the provision measures aim to reduce and mitigate deprivation, while the preventive measures attempt to prevent the incidence of deprivation and include various poverty alleviation measures. Promotive measures focus on improving incomes and capabilities 'through a range of livelihood-enhancing programmes targeted at both households and individuals'. The transformative measures target social injustice and various kinds of exclusion.

Social protection programmes can be categorised in three broad groups of programmes: social insurance, social assistance and labour market

regulations. Social insurance consists of programmes that aim to protect against contingencies such as maternity, old age, sickness, or unemployment. Social assistance programmes aim to support those in poverty, while labour market regulations ensure basic work standards and minimum wages for work etc. (Bariantos and Hulme, 2008).

According to Munro (2008), justification of social protection policies derives traditionally from three different discourses. The risks and market failures discourse provides reasons of failures in insurance markets often due to informational issues, along with the failures in credit, human capital and labour markets to justify provision of social protection. The rights-based discourse advocates for social protection to fulfill the obligations to grant legally enforceable social and economic rights to its citizens on the part of the State. Needs-based discourse on the other hand, invokes practical and moral arguments in favour of reducing and alleviating chronic poverty, and promotes employing social protection measures in achieving that. The constraints that the poor face may have different explanations resulting in different approaches towards social protection as means of addressing such constraints. Thus the overarching role and purpose of social protection may be to reduce social risk and market failures, satisfaction of basic needs, or contribute to human development through rights-based approach depending upon the strategies the policy makers adopt. For example, market failure discourse was largely responsible for enhanced social and economic roles of the State and thus the growth of the modern welfare state.

Social Protection In Low-Income Countries

Social protection as a major attribute of the welfare state has existed in the industrially developed countries in the form of social welfare assistance, insurance, and employment generation and protection. Fallouts of structural adjustment programmes, various economic crises, and effects of globalisation have motivated the low-income countries too to incorporate social protection programmes within

their policy frameworks since the early 1990s. Social protection in such countries is therefore largely focussed on poverty reduction and relies increasingly on transfer of incomes in conjunction with employment generation, creation of assets and provision of basic services.

Formal sector employment declined in most low-income countries as a result of structural adjustment policies. Such policies also resulted in decrease of wages in both public and private sectors. Thus, the contributory base was eroded for the statutory social insurance schemes. Structural adjustment policies

...the overarching role and purpose of social protection may be to reduce social risk and market failures, satisfaction of basic needs, or contribute to human development through rights-based approach depending upon the strategies the policy makers adopt.

further resulted in the massive cuts in social budgets thus adversely affecting the government contributions towards social insurance. Such schemes were therefore not as successful in low-income countries as in industrialised countries, particularly in case of a large majority of workers who worked outside the formal sectors. They could not afford to contribute to such schemes. In many cases, they were also not inclined to contribute towards the schemes that were not designed to meet their specific needs. These schemes were therefore largely limited to formal sector workers. Due to this reason, the social insurance schemes in low-income countries further skewed the income distribution in favour of formal sector workers especially because of the government subsidies on such schemes, as corresponding subsidies were not available to informal sector workers. This, in effect, results in transfer of resources from the informal sector workers to formal sector workers that strengthened the privileges of especially the elite in defence and civil services. A section of scholars thus advocates for limiting the social

protection privileges and expanding the social protection benefits. Structural adjustment programmes and influence of neo-liberal discourse also limited the state's role in providing health education services that adversely affected the informal sector workers and the poor. Recurrent global economic crisis and effects of increasing globalisation in trade and services further deteriorated the economic condition and bargaining power of the poor in low-income countries (for example, Stiglitz, 2002; Basu, 2006).

Social protection in its current form evolved as a political and economic response to this situation in low-income countries. This explains why although

Structural adjustment policies further resulted in the massive cuts in social budgets thus adversely affecting the government contributions towards social insurance. Such schemes were therefore not as successful in low-income countries as in industrialised countries, particularly in case of a large majority of workers who worked outside the formal sectors. They could not afford to contribute to such schemes.

the social insurance models in low-income countries generally follow the basic structures of such programmes in industrialised countries, the scope of social assistance programmes is much wider in low-income countries. In addition to protecting the poor from deprivation by helping them maintain a certain level of consumption as in industrialised countries, they aim to enhance their productive capacity by investing in their human capital development and in their physical asset formation. They further aim to help the poor to reduce their social exclusion by providing them with access to basic services and enhancing their participation in various social and other institutions. Social assistance is also sometimes employed to address the inequality issues in view of the

widespread poverty in low-income countries (Barrientos and Hulme, 2008). Other aspects of social protection include empowering the poor and strengthening their agency to reduce and alleviate their poverty (Sabates-Wheeler and Devereux, 2008).

It is now being increasingly acknowledged that poverty reduction policies based on strategies of economic growth alone lead to skewed outcomes across geographical and social spaces.. As Dreze and Sen (1991: 10) argue, the issues of 'widespread, persistent deprivation' and the 'fragility of individual security' in low-income countries cannot be adequately dealt with the 'standard channels of economic growth and social progress' alone, as is generally believed to have been the case with the high-income countries. They contend that such a belief is misplaced as the general improvements in the conditions of living in high-income countries have been achieved through various social policies and public expenditures in the areas of education, health, employment and food security; rather than through economic growth alone. Moreover, the Gross National Product (GNP) per head measurements of the prosperity of a nation may not be a true indicator of the capabilities enjoyed by its population at large. Such measurements do not take into account the inequalities prevailing in the distribution of incomes and variations of incomes over time in individual cases.

It has been observed that the personal needs are higher at the time of reduced incomes, such as when an earning member of a household is suffering from ill health. Such income fluctuations could be more efficiently dealt with if insurance and capital markets were well functional but that is usually not the case in respect of low-income countries. Even otherwise, high individual incomes may not necessarily imply enhanced capabilities especially in absence of other social provisions such as in the areas of health and education. This analysis thus indicates that 'economic growth alone cannot be relied upon to deal either with the promotion or with the protection of living standards' (Dreze and Sen, 1991:

14). 'Limitations of private markets in generating good living conditions' may also render such strategies of social protection based on economic growth alone infeasible (Dreze and Sen, 1991: 31). Moreover, as Platteau (1991: 163) points out that, '[w]hile market forces and institutions may help in reducing the risk of hunger, particularly in so far as they increase self-reliance by diversifying sources of income and supply as well as market outlays, they also open the way for new sources of vulnerability'.

Dreze and Sen (1991: 32) further cite the experience of China, Costa Rica, Cuba, Chile, Jamaica and Sri

Social protection in its current form evolved as a political and economic response to this situation in low-income countries. This explains why although the social insurance models in low-income countries generally follow the basic structures of such programmes in industrialised countries, the scope of social assistance programmes is much wider in low-income countries. In addition to protecting the poor from deprivation by helping them maintain a certain level of consumption as in industrialised countries, they aim to enhance their productive capacity by investing in their human capital development and in their physical asset formation.

Lanka to argue that it is not necessary to wait for high economic growth to achieve substantial improvements in the general living conditions for a large section of the population through appropriate public action.

Social Protection In India

Various aspects of social protection constituted an important part of the agenda of the Indian Freedom movement and the government of newly-independent India initiated several social protection programmes.

Such programmes were considerably scaled up and new programmes were initiated in the late 1960s and early 1970s in response to various natural calamities, droughts and food shortages during that period. Next phase of spurt in social protection was witnessed in the later half of 1990s, when it was realised that the gains from economic reforms and increased globalisation of Indian economy were largely bypassing a large section of the society. Various social protection programmes were therefore scaled up and new programmes such as those guaranteed under National Rural Employment Guarantee Act and later Right to Food Act were launched.

...the claims of poverty reduction due to economic growth caused by liberalisation of economy are largely based on the assessment of benefits accrued to the section of population possessing some means of production such as land, equipments or other forms of petty capital. Poor, however, lack resources and thus means of production, and sell their low-skilled or unskilled labour to earn livelihoods. They do not gain from increased growth rates in the economy.

Panagariya (2008) strongly correlates the increase in the rate of growth of Indian economy to the process of reform and liberalisation and claims that it has also led to substantial reduction in poverty. Reports of the National Commission for Enterprises in the Unorganised Sector (NCEUS) however clearly show that the people engaged in informal employment, constituting 93 per cent of India's total workforce, are steeped in poverty and that their deprivation has not been reduced substantially during the period from 1993-94 to 2004-05 associated with large-scale reforms in Indian economy. According to such reports, the employment growth rate plummeted during this period to 1.85 per cent on an average from over two per cent

on an average in the immediately preceding ten years. More importantly, such growth in employment was almost entirely limited to the informal sectors of economy. This did not help the people, additionally employed during this period, to come out of poverty. Real wage growth rate also fell during this period. NCEUS thus concludes that the substantial jump in the economic growth was not translated into employment generation and enhancement of incomes for a large number of Indians. Quality of employment was also found to be adversely affected in general during the period of high economic growth due to a process of informalisation of a section of formal sector workers, and job-cuts in government and public sectors. Increased tendency to outsource various types of work to contractors in the formal, including the government and public, sectors also contributed to this phenomenon (e.g., Breman 2010) Such informalisation, associated with low wages, longer working hours, and general lack of employment and social security further contributed to poverty among the informalised workers and deteriorated their living conditions. Breman (2010) argues that the claims of poverty reduction due to economic growth caused by liberalisation of economy are largely based on the assessment of benefits accrued to the section of population possessing some means of production such as land, equipments or other forms of petty capital. Poor, however, lack resources and thus means of production, and sell their low-skilled or unskilled labour to earn livelihoods. They do not gain from increased growth rates in the economy. According to him, high levels of growth in Indian economy have greatly benefited the upper and middle classes, having means of production and/or formal sector employment, while a large section of population engaged in informal employment has not been able to participate in the Indian economic growth process.

Social Protection And Poverty

Social protection is being increasingly recognised as an important instrument to promote social and economic development effectively

contributing towards reduction of poverty and vulnerability. Poverty reduction policies based on strategies of economic growth alone lead to skewed outcomes across geographical and social spaces. Social protection measures are therefore needed to deepen and widen the poverty impacts of economic growth. They help the households come out of poverty traps caused due to low incomes and limited opportunities. Social transfers, especially the conditional transfer programmes, promote enhancement of human capital.

The constraints that the poor face may have different explanations resulting in different approaches towards social protection as means of addressing such constraints.

Thus the overarching role and purpose of social protection may be to reduce social risk, satisfaction of basic needs, or contribute to human development through rights-based approach depending upon the strategies the policy makers adopt while addressing the aforementioned constraints.

There is now a general consensus on poverty being multidimensional and caused mainly due to the constraints the poor face while attempting to participate in, and benefit from the economic activities and opportunities. Increased emphasis on social protection in low-income countries during recent times may be seen as a response to such understanding of poverty. The constraints that the poor face may have different explanations resulting in different approaches towards social protection as means of addressing such constraints. Thus the overarching role and purpose of social protection may be to reduce social risk, satisfaction of basic needs, or contribute to human development through rights-based approach depending upon the strategies the policy makers adopt while addressing the aforementioned constraints. It is however observed that over the last decade, the focus of social protection programmes has

moved from social risk and basic needs perspectives towards enhancement of human capabilities. They also mention that social protection has now become one of the three main elements of national development strategies along with economic growth and human development. The speed with which social protection programmes have been scaled up in the low-income countries over the last decade is unprecedented. Barrientos and Hulme (2008) estimate that the programmes in force may have a combined capacity to reach half a billion people in poverty. They also feel that such a scale of the programmes have the potential to significantly reduce global poverty. What makes them different from the earlier poverty alleviation and development programmes is that they are focussed on the poor and the poorest.

The evidence suggests that social protection programmes have the potential to alleviate suffering of a large population in poorer countries in the shorter run, while also contributing

to overall human development in the longer run. Moreover, as Barrientos and Hulme (2008: 315) point out, 'social protection has managed to avoid the 'silver bullet' syndrome and naïve replications that characterised social funds and much microfinance in the 1990s'. The current challenge, according to them is to integrate a variety of programmes to address different issues associated with poverty at different levels simultaneously.

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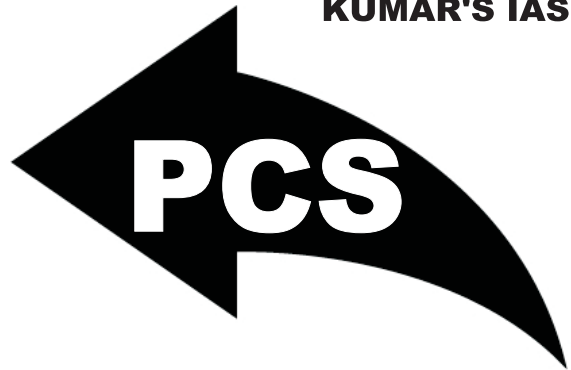
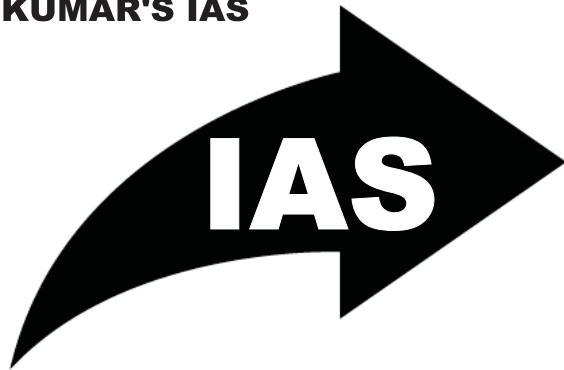
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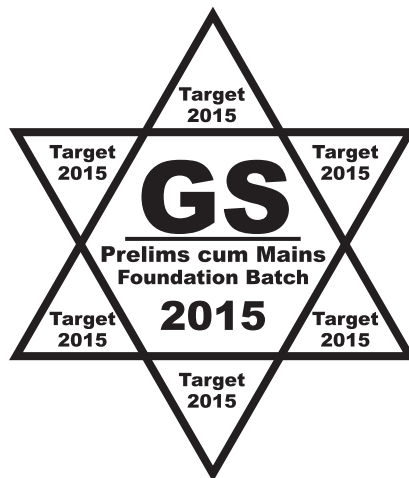
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Agricultural Growth in India: Performance and Prospects

*P K Joshi
Anjani Kumar*



Effective system need to be evolved right from basic strategic research to location-specific technology development to ensure adoption of technologies at the farm level. Technology generation and extension must be in viewed in continuum. Further, the spread of agricultural growth to less developed regions would lead to increase in the overall agricultural growth as well as reduction in rural poverty in the country

AGRICULTURAL DEVELOPMENT has been a primary goal of India's efforts to ensure food security and reduce poverty. In pursuing this objective, the planning process in the country has initiated several pro-poor policies and reform measures in agriculture sector to accelerate agricultural growth. Public measures directed at agricultural development have been focused on creating infrastructure, spreading adoption of modern inputs, increasing credit, enhancing irrigation facilities etc. These initiatives have a direct bearing on agricultural development. In recent years, the emphasis on having a more desirable composition of GDP growth by targeting an average 4 per cent per annum growth in agriculture sector has found favour with the policy makers. The agricultural sector has been in the centre of public policy discourse particularly after the global food crisis witnessed in 2008. Earlier too, the policy debates dominated the concerns of significant deceleration of agricultural growth during 1990s and the acute livelihood hardships of the farming communities and agricultural workers. Consequently, the Eleventh Five Year Plan (2007-2012) has placed heavy emphasis on agriculture and rural development

and a number of important policy measures have been initiated to address the issues of agrarian distress. These initiatives were taken forward and further strengthened in the Twelfth Five Year Plan. The performance of agriculture has shown a promising trend in the recent decade and the view of deceleration in agricultural growth has been put aside. This paper deliberates on the performance of Indian agriculture and the associated factors responsible for agricultural growth.

Contribution of Agriculture to Income and Employment in India

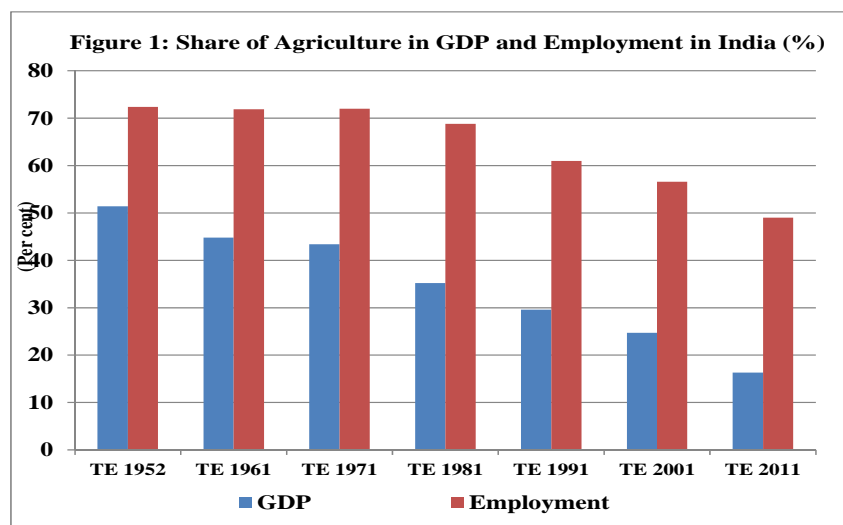
Indian agriculture has transformed significantly during the last six decades. These are reflected in the changing share of agriculture in national economy and employment. Agriculture contributed more than 51 per cent of total output of India's economy in early 1950s. Its share has steadily declined to about 16 per cent in TE 2011-12 (Figure 1). Obviously, the growth of industrial and services sectors have far outpaced the growth of agricultural sector. Transformation of Indian economy from agriculture to non-agriculture sector got a strong push after 1980-81. These changes are not contrary to the processes of economic growth and development experienced in other

Dr. P.K. Joshi is the Director for South Asia, Consultative Group on International Agricultural Research (CGIAR). Previous to this, he held the positions of the Director of the National Academy of Agricultural Research Management, Hyderabad, India, and the Director of the National Centre for Agricultural Economics and Policy Research, New Delhi. Anjani Kumar is Research Fellow, International Food Policy Research Institute (IFPRI).

developed countries. However, the slow absorption of workforce in the non-agricultural sector raises concerns when seen along with the changing structure of the national gross domestic product. The asymmetry in income and employment shares of agricultural and non-agricultural sectors created a widening gap between the incomes of agricultural and non-agricultural workers. This has become a major source for growing rural-urban divide and inter-sectoral disparities. However, the share of agriculture in employment, which almost stagnated around 70 per cent for first three decades, declined by 22 per cent in the next three decades. The opportunities in non-agricultural sectors have started growing relatively at a faster rate in the recent years, leading to decline in the share of agriculture in employment by more than 10 per cent in the most recent decade. The latest estimates reveal that about 49 per cent of the total labour force was engaged in agricultural sector in 2011-12. This offers a ray of hope for declining dependence of workforce on agriculture if a similar trend continues in future.

Growth of Agriculture Sector

Agricultural growth is necessary not only for attaining high overall growth but also for accelerating the speed of poverty reduction in a developing country like India. The annual compound growth rates of agricultural sector have been quite dismal ranging from 2 to 3 per cent during all decades after independence, with exception during the sixties. It was 2.6 per cent per annum during fifties but decelerated to 1.7 per cent per annum during sixties. Later it accelerated, touching 3.2 per cent per annum, in the nineties and during 2000-12. It reached to 3.5 per cent against the target of 4 per cent per annum. The growth of agricultural sector remained higher than the growth rate of population in the country. However, the non-agricultural sector has grown faster than the agriculture and the divergence between agricultural growth rate and



Source: Base data are from National Accounts Statistics, GOI; NSSO Reports on Employment and Unemployment in India (Various rounds)

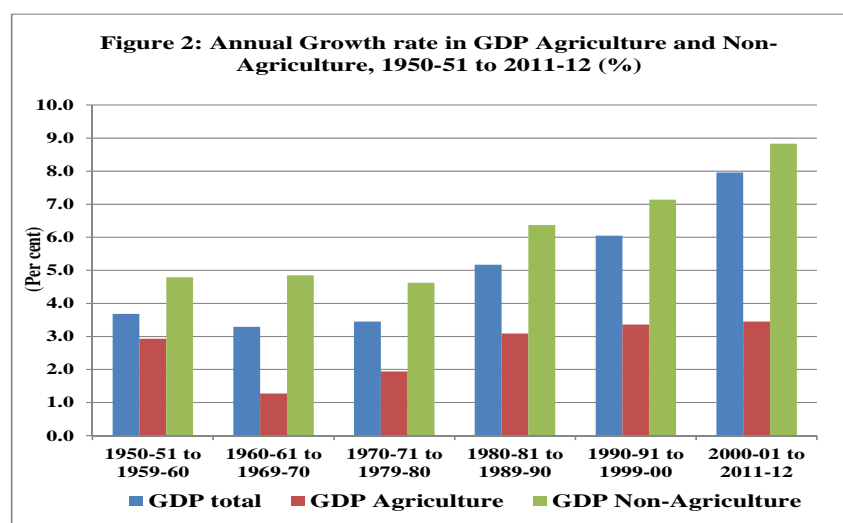
growth rate of the Indian economy continue to persist (Figure 2).

Performance of sub-sectors in Agriculture

Crop sector

The growth of crop sub-sector in the first decade of India's planning phase (1950s) was quite modest (3.1 per cent). The First Five-Year Plan accorded highest priority to agriculture and allocated substantial part of the plan outlay to this sub-sector. This period witnessed remarkable progress in land reforms, institutional changes, and operationalization of some major irrigation projects. These initiatives

played an important role in achieving higher growth of the sector during this period. The importance and priority given to agriculture was diluted in the Second and Third Five-Year Plans, and there were occurrence of severe droughts too in the mid-sixties. As a consequence, the sub-sector witnessed a deceleration during sixties (1.7 per cent). This led to severe shortage of foodgrains, and the country was compelled to import huge quantities of foodgrains. The food aid from the USA came with conditionality, which forced the country to put greater efforts to increase foodgrain production. In mid-sixties, a new agricultural development strategy



Source: Base data are from National Accounts Statistics, GOI.

was adopted which emphasized on spreading the adoption of dwarf and high-yielding varieties (HYVs) of wheat and rice. The new strategy paid dividends and resulted in well-acclaimed 'green revolution'. The crop sub-sector, which was growing at an annual rate of 1.8 per cent in the seventies, grew at the rate of 2.2 per cent in eighties and 3.0 per cent in the nineties. Though the same growth in the crops was maintained, it fell short of the targeted growth rate of 4 per cent in the eleventh five year plans (Table 1).

The policy support, adoption of improved production technologies and public investment in infrastructure, research and extension contributed to growth in the crops sub-sector. However, investment on agriculture declined throughout the nineties, leading to a slowdown in the agricultural growth especially in the late nineties. This led to deceleration in growth of total factor productivity in the north western region, especially in rice and wheat growing areas (Kumar *et al.*, 2004). In fact, investment on agricultural research, education and road development paid the highest returns to agricultural GDP and reduction in rural poverty (Fan, Gulati and Thorat, 2007). Recognizing the importance of investment and the continuous threat to the production and lowered factor productivity of rice and wheat prompted government to take corrective measures to reverse such trends and conscious efforts have been made to raise investment in agriculture.

Livestock Sector

The growth of livestock sub-sector was modest till 1970. It was 1.4 per cent per annum in the fifties and as low as 0.4 per cent per annum in the sixties. An upsurge in growth rate in livestock sector was registered in the seventies when it rose to 3.9 per cent per annum. Livestock sub-sector growth was always higher than crop sub-sector since 1970. This was even during the heydays of green revolution (seventies and eighties);

when the policy emphasis was largely focused on the crop sub-sector. The acceleration continued in the eighties (4.9 per cent) but it slackened in the nineties and after 2000s. Even then, this sub-sector was able to maintain a respectable growth rate close to 4 per cent per annum. The impressive performance of the livestock sector is attributed to effective government interventions, success of the Anand Pattern Cooperatives, and rising demands for livestock products in response to rising incomes in urban and rural areas and growing urbanization. The liberalization of livestock markets, entry for private sector in marketing and processing of livestock products, improvement in veterinary services, trade friendly policies (esp. buffalo meat), emphasis on improvement in quality and hygiene of the livestock produces etc. gave further fillip to this sub-sector. Future increases in per capita income and changing consumption patterns would lead to still higher demand for livestock products which would give further boost to this sector.

Fisheries

Fish sector has been recognized as a promising source of augmenting income, generating employment and improving nutrition. It is also an important source of livelihood for a large section of economically

backward population. With the changing consumption patterns, emerging market forces and technological developments, it has assumed added importance. On the whole, the growth of the fisheries sub-sector in India has been remarkable; growth rate of more than 5 per cent per annum in the eighties and nineties and is attributed to the rapid development of aquaculture. This sub-sector is still registering an annual growth rate of more than 4 per cent per annum.

Changing Contribution of Different Commodities to Agricultural Growth in India

Crops are the major components of agricultural economy and the performance of agricultural sector has been traditionally dependent on the performance of crops sub-sector. However, the contribution of crop sub-sector has been declining overtime in the agricultural growth from about 79 per cent during 1970s to 60 per cent during the 2000s. The contribution of livestock grew almost three times and it accounted for more than one-third of the agricultural growth. Within crops, the share of cereals has gone down from 43 per cent in the green revolution period to merely 13 per cent in the recent decades. The main source of growth in the crops sector is the horticultural crops. It accounted for 47 per cent of the growth in the

Period	Crop sector	Livestock	Fisheries	Horticulture crops	Non-Horticulture crops	Cereals
1950-51 to 1959-60	3.06	1.42	5.79	0.74	3.52	3.95
1960-61 to 1969-70	1.70	0.41	4.00	4.87	1.09	2.10
1970-71 to 1979-80	1.79	3.92	2.90	2.86	1.49	2.40
1980-81 to 1989-90	2.24	4.91	5.67	2.63	2.12	2.89
1990-91 to 1999-00	3.02	3.79	5.36	5.95	2.07	2.24
2000-01 to 2011-12	3.12	4.45	4.06	4.11	2.76	2.12

Source: Base data are from National Accounts Statistics, GOI;

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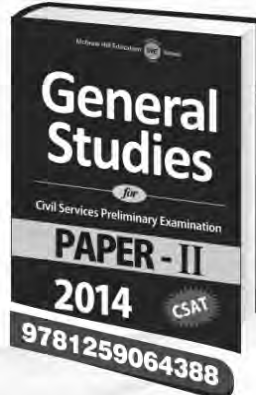
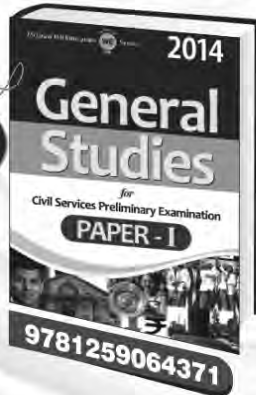
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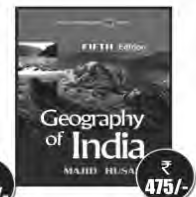
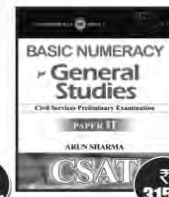
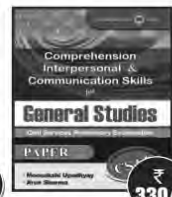
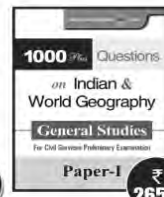
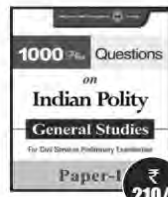
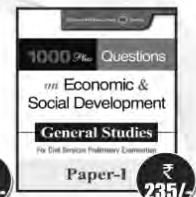
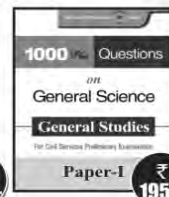
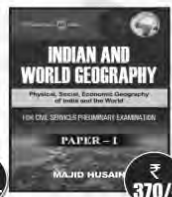
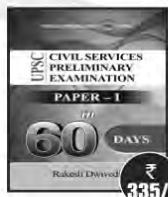


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value of output from crops sector. Among cereals, maize and cotton are the exceptions and their contributions to the agricultural growth have been increasing. Diversification towards high value commodities has been observed to be a sustainable source of growth, which provides an opportunity to smallholders to enhance their income and enable them to escape poverty (Birthal *et al.* 2014)

Among livestock products, milk and milk products are the major items. However, this sub-sector seems to be diversified overtime and the contribution of meat, poultry and eggs has been increasing in the growth of this sector. Their contribution in the growth of this sub-sector increased from about 3 per cent during 1950s to about 30 per cent during 2000-11s. Similarly, in fisheries the inland fisheries, have emerged as the source of fisheries growth. Its contribution to fisheries growth was about 31 per cent during 1960s and 1970s, and now accounting for 83 per cent of the fisheries growth during 2000-11 (Figure 3).

Regional Trends: Emergence of New Sources of Agricultural Growth in India

With these national trends, there are wide inter-state variations. The ranking of various states based on the productivity witnessed significant changes during this period because of

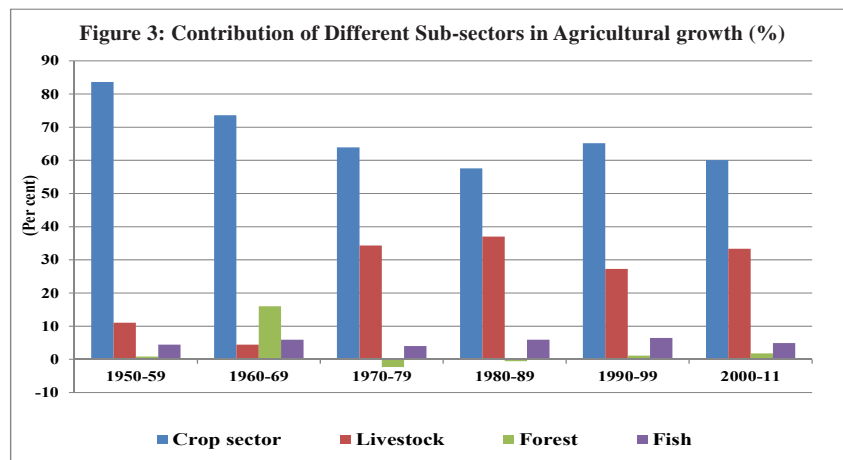
Table 2: Contribution of States in the Growth of AgGDP of India

State	Agriculture and allied activities		
	1980-89	1990-99	2000-09
Andhra Pradesh	6.4	7.3	10.7
Assam	2.3	0.7	1.5
Bihar	8.8	0.1	4.7
Gujarat	-1.9	9.0	19.2
Haryana	5.1	2.6	3.2
Himachal Pradesh	0.3	0.1	1.3
Jammu & Kashmir	0.0	0.0	1.1
Karnataka	6.0	9.4	-0.2
Kerala	1.8	2.7	3.1
Madhya Pradesh	4.8	8.0	11.7
Maharashtra	9.4	13.8	10.5
Orissa	4.2	1.8	3.1
Punjab	10.1	5.2	3.8
Rajasthan	6.3	7.0	9.6
Tamil Nadu	6.5	5.8	1.6
Uttar Pradesh	13.8	13.2	6.5
West Bengal	14.4	13.6	6.3
Other State	1.7	-0.3	2.3

Source: Base data are from National Accounts Statistics, GOI

variations in the growth rate of NSDP agriculture. The growth witnessed by different states varies widely. The sharp variations of agricultural growth across states seem to have altered the regional growth sources of Indian agriculture. During eighties West Bengal (14.4 per cent), Uttar Pradesh (13.8 per cent), Punjab (10.1 per cent), Maharashtra (9.4 per cent), Bihar (8.8 per cent), Tamil Nadu (6.5 per cent) and Andhra Pradesh (6.4 per cent) were the main contributors to agricultural growth in India. They together accounted for about 70 per cent of growth in Indian agriculture during 1980s. During 1990s, Maharashtra emerged

as the biggest contributor to national agricultural growth with 13.8 per cent contribution, closely followed by Uttar Pradesh (13.6 per cent) and West Bengal (13.2 per cent). Two states, low in agricultural productivity per ha, Gujarat and Rajasthan, emerged as the major contributors to agricultural growth during 1990s and each contributed 9 and 7 per cent, respectively. Madhya Pradesh is another state whose contribution to growth in Indian agriculture increased considerably from 4.8 per cent during 1980s to 8 per cent during 1990s. The contribution from Andhra Pradesh also increased slightly from 6.4 per cent during 1980s to 7.3 per cent during 1990s. The contribution of Bihar in growth of Indian agriculture during 1990s was nil. The subsequent decade witnessed Gujarat emerged as the biggest source of national agricultural growth. It contributed about 20 per cent of the national average growth of agriculture. The contribution from Madhya Pradesh further accelerated and reached to 11.7 per cent. Bihar also emerged as one of the major contributor to the national agricultural growth and it contributed about 5 per cent to the agricultural growth in India during 2000s. However, the contribution from Uttar Pradesh and West Bengal



Source: Base data are from National Accounts Statistics, GOI

declined substantially during this period (Table 2).

Regional convergence of agriculture is another dimension, which need serious attention of the policy makers. This is driven partly by the diversity in the production potential and extensive cultivation in marginal areas, and partly by policy priority promoting food production regardless of technical or economic efficiency (Jha, 2004). Several studies have shown that there are large disparities in agricultural performance across regions and the primary sector has been attributed to be the major source of regional disparities of inter-state income in India. Moreover, the deceleration in agricultural growth in the late 1990s renewed the debate of convergence in agricultural performance across states in India. The indicators of regional disparities exhibit a fluctuating trend. High level of regional disparities in agricultural output and productivity during the 1980s which tapered off to some extent during 1990s again started rising during the recent decade of 2000s. The persistence of regional variations poses a challenge for attaining balanced regional agricultural development.

Factors for Agricultural Growth

The wide spread adoption of high-yielding varieties, expansion of irrigation facilities and increase in fertilizer application along with improvement in rural literacy, increase in agricultural credit and improved infrastructure played a

significant role in the agricultural growth of the country. The use of modern inputs increased significantly. During the green revolution of 1970s, the cropped area planted with HYVs cereals increased from less than 17 per cent in 1970 to 40 per cent in 1980. The area under HYVs continued to increase and reached 70 per cent of the cropped area by 2009-10. Similarly, the cropped area under irrigation, increased from 23 per cent in 1970 to 34 per cent in 1990 and 45 per cent in 2011-12. But the increase has been only marginal in recent years. The fertilizer consumption (NPK) per ha was merely 26 kg in 1970, increased to 58 kg by 1980-81, to 96 kg in 1991. The fertilizer consumption in 2011-12 was about 195 kg/ha (Table 3). It is well documented that HYVs, irrigation and fertilizer application have been major engines of productivity growth in Indian agriculture.

The rapid electrification has been one of the greatest achievements in the rural India. In 1970, only 34 per cent of the villages in rural India were electrified. But in 1995 this percentage increased to 86 per cent, which rose to 95 per cent in 2014. The increase in electrification not only contributes to agricultural growth, by encouraging more irrigation, it also contributes to reduction in rural poverty through generation of non-agricultural employment opportunities (Fan *et al.*, 1999). The literacy rate in rural India has increased steadily from 23 per cent in 1970 to 69 per cent in 2011.

Similarly, there has been significant increase in road density in rural India and considerable enhancement in the flow of agricultural credit.

Prospects for Acceleration of Agricultural Growth

The continuing primacy of agriculture as the primary source of employment in the Indian rural economy calls for acceleration of agricultural growth. However, the increasing marginalization of land holdings in most of the Indian states, accompanied with increasing fragmentation compounds the challenges of increasing productivity and accelerating agricultural growth. Ensuring sustainability and economic viability of smallholders and improving their competitiveness in production and marketing by facilitating better access to improved technology, inputs, credit and markets is crucial for higher and inclusive agricultural growth. If appropriate institutional alternatives are provided, smallholders are as competitive as large farms. Options for easy leasing out of land must be encouraged. This would induce several farm families to go out of agriculture and make fortunes in other sectors. This would also create an opportunity for others to raise the size of their holdings by leasing-in land.

Shifting a large chunk of workforce from agriculture by creating productive work opportunities in the non-farm sector is also required to check the disturbing trend of increasing disparities between agricultural and non-agricultural occupations. However, accelerating agricultural growth is crucial to ensure food security and enhance the welfare of the people dependent on agriculture. Pragmatic and plausible options to accelerate agricultural growth need to be harnessed. The level of cropping intensity continues to be very low in spite of significant progress in the irrigation facilities. In Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, more than one crop is grown on less

Table 3: Technology and, Infrastructure Use in Indian agriculture, 1970-71 to -2011-12

Year	HYVs (per cent)	Irrigation (per cent)	Fertilizer consumption (kg/ha)	Literacy rate (per cent)	Electrified village (per cent)
1970-71	16	22	20	23	20
1980-81	42	28	39	29	45
1990-91	52	34	88	36	81
2000-01	55	39	118	47	86
2011-12	70*	45	199	69	95 ⁺

Source: *Agricultural Statistics at A Glance (Various years): refers to 2009-10; + in January 2014.*

than 30 per cent of the area under cultivation. The low level of cropping intensity indicates the possibilities of substantial enhancement in agricultural output by increasing area under double cropping.

The fertilizer use has increased in the country but the inter-state variation in its use is glaring. Fertilizer use in the recent years is as low as 40-50 kg/ha in Assam, Orissa and Rajasthan and as high as 330 kg/ha of net sown area in Punjab. The agricultural output can be substantially enhanced by increasing fertilizer application in lagging states. Similar is the story of use of electricity in agriculture. Consumption of electricity was just 11 kWh/ha in Assam, whereas it exceeded 1,000 kWh/ha in Andhra Pradesh, Gujarat, Haryana, Punjab and Tamil Nadu. Increase in electric supply to agriculture is crucial for promoting irrigation facilities, which in turn can increase agricultural output.

The coverage of irrigation in various states varies from 5 to 95 per cent. There is a large gap between the current level and the ultimate irrigation potential (except in Punjab, Haryana and Rajasthan). Bihar has abundant water resources, which can cater to the needs of irrigation requirements even for further expansion in gross cropped area through an increase in cropping intensity. Similarly, Uttar Pradesh has the potential to raise the level of irrigation to 95 per cent. Only 5 per cent of GCA in Assam and 32 per cent in Orissa are irrigated though

these states have irrigation potential to cover 2/3rd of their gross cropped area.

The level of productivity of most of the crops is quite low in most of the states. However, available evidence shows that there is a big gap between the level of yield with improved farm practices in farmers' fields and the actual yield realized by the farmers. Bridging the existing yield gap would enhance agricultural output considerably. For achieving the existing potential, availability of quality seed is the most critical factor apart from strengthening the technology transfer mechanism. India needs to develop a competitive market for seeds by intensifying the role of public sector and by encouraging private sector in seed business vigorously.

Though input subsidies are critical for smallholders in marginal and deprived areas, there is a need of reorienting the policies to maximize the gains to small farmers and increase efficiencies in its use and conserve natural resources. It is necessary to emphasize productivity-enhancing interventions and subsidies should be geared towards promoting use of technologies that increase productivity and enable movements up the value chain in agricultural production. Shifting of agricultural processing into rural areas should be paid serious attention. A strong integration and effective coordination is required in Research, Education and Extension. Effective system

need to be evolved right from basic strategic research to location-specific technology development to ensure adoption of technologies at the farm level. Technology generation and extension must be in viewed in continuum. Further, the spread of agricultural growth to less developed regions would lead to increase in the overall agricultural growth as well as reduction in rural poverty in the country. Policy measures like land reforms, enhanced rural credit, and greater public investment are important to promote agricultural growth in less developed regions.

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(E-mail:p.joshi@cgiar.org
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Indian Agriculture: Emerging Issues and Policy Perspectives

Srijit Mishra



Indian agriculture has been going through a crisis that is agrarian as also agricultural. A way out of this is to explore context-specific knowledge-centric approaches. This, to borrow a term, has the potential for an inclusive, sustainable and food-secure India

The summer of 2014 got drenched with the elections euphoria, but for Indian agriculture all eyes are set on the prospects of a good monsoon. Is there a possibility of an *El Nino*? Will it lead to a drought like condition and have an adverse impact on agricultural production? How will this impact those dependent on agriculture for their livelihood? What about farmers' suicides? These questions remind us of the larger agrarian crisis and its interrelated dimensions of an agricultural developmental crisis. The former is about declining share of the overall pie towards agricultural sector, poor returns to cultivation, and nutritional deprivation while the latter is about inadequate and inappropriate planning that led to a deceleration in the growth rate of production and productivity, and an increase in risk and vulnerability. This also calls for alternative policy thinking.

Agrarian Crisis

The share of agriculture and allied activities in gross domestic product at constant 1999-2000 prices decreased from 41 per cent in 1972-73 to 14.6 per cent in 2009-10 while during the same period the share of employment in the sector declined from 73.9 per cent to 53.2 per cent. This means

that the average returns per worker in agricultural households was less than Rs.8. Assuming a 6 per cent annual average growth rate, which is much on the higher side, the per capita per day returns in 2013-14 would double to Rs.16. This explains the poor returns to cultivation. With nearly half the population being still dependent on agriculture, the non-farm opportunities remain limited.

The *2013 Global Hunger Index* puts India at a rank of 63 from among 78 countries, which is lower than some of the Sub-Saharan countries and all the other South Asian countries. The per capita per day availability of foodgrains, as indicated in the *State of Indian Agriculture 2012-13*, has reduced from 510 grams in 1991 to 463 grams in 2011. This is also reflected in the per capita per day calorie and protein consumption as the national sample survey estimates of 1993-94, 2004-05 and 2009-10 suggest. Such an outcome is also because of a shift in the cereal production and their consumption from millets to rice and wheat. There have been recent initiatives to increase the millets production and their consumption.

The manifestation of the agrarian crisis has been identified with farmers' suicides. However, it is symptomatic and its absence does not necessarily

The author is Associate Professor at the Indira Gandhi Institute of Development Research (IGIDR), Mumbai. His research relates to applied development economics. He was the Subir Chowdhury Fellow 2013-14 at the London School of Economics and Political Science (LSE). He has co-edited the book *Agrarian Crisis in India*, Oxford University Press (2009) with D. Narasimha Reddy.

preclude risks. A comparison of suicide mortality rates (SMRs, suicide deaths for 100,000 persons) between farmers and non-farmers suggests that at the all India level the difference in the rates diverged the most in 2004 (18.8 and 13.6) and then there was a secular decline in the gap till 2008 (16.9 and 14.7) to diverge again in 2009, a drought year, and then started converging again from 2010 to 2012. However, a closer look at the six states with relatively higher incidence of farmers' suicides indicate that for the recent three years (2010 to 2012) the rates are diverging in Andhra Pradesh, Maharashtra and Kerala and

However, a closer look at the six states with relatively higher incidence of farmers' suicides indicate that for the recent three years (2010 to 2012) the rates are diverging in Andhra Pradesh, Maharashtra and Kerala and converging in Chhattisgarh, Karnataka and Madhya Pradesh.

converging in Chhattisgarh, Karnataka and Madhya Pradesh. The turnaround in Chhattisgarh is because it has stopped reporting farmers' suicides and instead increased reporting of a category called self-employed others. In addition, West Bengal did not report profession-wise suicides data for 2012. Thus, the convergence that one observed at the all India level is more on account of inappropriate and incomplete reporting. In any case, one has to look up other aspects to identify possible changes.

Agricultural Developmental Crisis

Using triennium ending data divided to three sub-periods, 1981-82 to 1993-94, 1993-94 to 2004-05 and 2004-05 to 2010-11, an analysis of growth rates computed through a double-kinked exponential curve suggests that the growth of agriculture and allied activities in the first period (3.3 per cent) was statistically significantly higher when compared with the second

period (2.7 per cent) and there has been an increase in the growth rate in the recent period (3.0 per cent). An analysis in terms of value addition points out that the growth rate in the first period was statistically significantly higher than the second period for cereals (3.3 per cent and 1.0 per cent), pulses (1.5 per cent and -0.03 per cent), oilseeds (6.1 per cent and 0.5 per cent), cotton (4.1 per cent and 1.0 per cent), milk (5.0 per cent and 3.7 per cent) and meat (5.1 per cent and 2.9 per cent); the growth in the third period was higher than the second period for all the above except for milk (3.5 per cent) and it was statistically significantly higher for pulses (2.5 per cent), oilseeds (4.8 per cent) and cotton (13.7 per cent). The trends observed till 2010-11 have continued till 2013-14, but for a setback in 2012-13 because of delayed onset and deficient rainfall.

Conventionally, in monsoon India, the farmer was exposed to either yield or price shocks that were supposed to move in opposite directions counterbalancing each other. Today, the possibility of yield risk increases because of unavailability of power that in turn affects water availability at a crucial time, or because of spurious seeds or due to an increase incidence of pest attack or because of weather changes. Further, because of global integration, price volatility has increased and price shocks could be because of higher subsidies in the United States or the European Union. And, with these changes the two risks do not counterbalance each other and the farmer can also be exposed to both the shocks in the same season.

Over the years, the farmer is increasingly relying on the market for inputs. The link between ground realities and publicly funded research and extension is waning and the farmer depends on the input-dealer leading to a supplier-induced-demand. What is more, the private provisioning of inputs without any regulation to address the sale of spurious products or other market irregularities increases farmers' vulnerability. Further, with changes in technology, the farmers'

current knowledge become redundant and there is deskilling.

Adequate, affordable and timely availability of credit would be essential for any enterprise, but this has been eluding the Indian farmer. In addition, agricultural credit is about doing the same things again and again and not linked to horizontal or vertical expansions. Thus, any shocks are likely to make debt non-serviceable and this would make the farmer ineligible for subsequent loans from formal sources. This would increase the reliance on informal sources at a greater interest burden.

Input-intensive cultivation practices bring in risks that go beyond weather and market uncertainties. There can be inappropriate fertiliser applications having an adverse impact on soil health resulting in yield fatigue or pesticides having harmful impact on livestock and human health or depletion of groundwater among others. A way out being propagated is an expansion of

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the same, that is, to bring more areas under the input-intensive approach - the look east policy being touted under a second green revolution or an evergreen revolution. The argument put forward in favour of this or other technology-driven approach is that there is no alternative (TINA).

Alternative Policy Thinking

In practice, multiple alternatives exist (MAE) that is context-specific.

It differs across locations and evolves over time. It questions the one-size fits all approach. Such thinking takes advantage of the variability of the natural resource base and the diversity in the production systems. As each crop has a different life cycle, the diversity spreads out the vulnerability from each episode of unforeseen climatic events. In addition to an integration of different crops, the system is also integrated with livestock production. These could lead to low external input sustainable agriculture (LEISA). The application or propagation of this approach is knowledge centric.

The comprehensive pilots are spread across different agro-ecological conditions and focuses on integrating knowledge-centric interventions on water, soil, seed, livestock, fisheries, credit and institutions among others. They also collaborate with the local-level line departments and other government functionaries, as that is very essential to scale-up within the pilot area. The interventions that started in Kharif 2012 have attracted the attention of the Planning Commission, the Department of Science and Technology and the Food and Agriculture Organization.

Comparing knowledge-centric MAE to technology-driven TINA, one can state the following.

MAE is bottom-up where different knowledge providers will not only have to keep the local specifics in mind, but will have to work in tandem with the users. TINA is top-down where the provider of the technological-fix, as a solution to some presumed problem, is considered hierarchically superior to the user of that technology.

MAE is context-specific, requires

an understanding of the system dynamics and evolving effective structures of managing them. TINA is crop-specific and involves application of inputs/technology to enhance production.

MAE focuses on the production of a complex system with an important emphasis on risk reduction. TINA focuses on a single crop or livestock with an emphasis on improving productivity.

MAE understanding of efficiency is from a system perspective. TINA looks into efficiency in the technological and economic sense that is normalised per unit of input.

MAE involves marginal lands with the crop-livestock system spread over a larger area and in that sense is extensive. TINA is mainly in areas with better soils and with access to water (preferably through irrigation) and input-intensive.

MAE is about integration of mixed and multiple crops with livestock. TINA is about specialisation that espouses mono-cropping.

MAE production on private lands is dependent on commons. TINA production is in owner-operated lands.

Despite these differences, MAE like TINA, cannot happen on its own. To promulgate it, one needs the support of appropriate knowledge, resources and adequate leveraging with marketing opportunities and information technology. It also requires constant monitoring and evaluation.

One of the recent initiatives in-line with MAE is the interventions in comprehensive pilots through the Revitalizing Rainfed Agriculture Network (RRA-N) comprising of a number of civil society groups spread across the country. The comprehensive pilots are spread across different agro-ecological conditions and focuses on integrating knowledge-centric interventions on

water, soil, seed, livestock, fisheries, credit and institutions among others. They also collaborate with the local-level line departments and other government functionaries, as that is very essential to scale-up within the pilot area. The interventions that started in Kharif 2012 have attracted the attention of the Planning Commission, the Department of Science and Technology and the Food and Agriculture Organization. This requires greater research engagement that will delineate the specificities in each comprehensive pilot and identify the similarities across comprehensive pilots to facilitate their application beyond the pilot areas.

To sum up, Indian agriculture has been going through a crisis that is agrarian as also agricultural. A way out of this is to explore context-specific knowledge-centric approaches. This, to borrow a term, has the potential for an inclusive, sustainable and food-secure India.

To promulgate it, one needs the support of appropriate knowledge, resources and adequate leveraging with marketing opportunities and information technology. It also requires constant monitoring and evaluation.

(This paper draws from some of the recent works by the author. They include: Technology, Development, and Farmers' Suicides in India: A Misplaced Debate, Visiting Fellows Seminar, Asia Research Centre, London School of Economics and Political Science, 20 March 2014; Agriculture in India: Performance, Challenges and Opportunities (with S Mahendra Dev and Vijaylaxmi Pandey) in Ashima Goyal edited *The Oxford Handbook of the Indian Economy in the 21st Century*, Oxford University Press (OUP), New Delhi, 2014; etc.). □

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Illuminating the Dark-dense Forests

IN THE deep-dark forests of the Achanakmar tiger reserve in Chhattisgarh, scattered over an expanse of 557.55 square kilometers, wild animals and humans coexist. As dusk falls, it is time for the wild to emerge, forcing the humans to lock themselves in. What is common on both sides of the locked doors is darkness, for there is no electricity in the villages falling in the buffer zones of the reserve, or so it used to be.

Today, residents of Bamhani, a far flung village in the Achanakmar Tiger Reserve, have moved on from the days of sheer darkness, with lit bulbs, charged mobile phones, refrigerators and water-motors becoming increasingly common. The credit for this silent revolution transpiring in the dense jungles goes to the Government and non-Government Organizations as the villages are now lit up and better still, using natural light.

Jan Swasthya Sahyog, a non-Government organization with expertise in the field of healthcare, is one of the non-Government organizations that have distributed solar lights in the area in the last three years. Besides, the Government's Energy Department has also provided power to these villages by installing solar plants. Most of the villages in this region have street lights as well as domestic lights through solar energy.

"From preparing food at night to a walk towards the farm, a minimum quantity of light is always required. Villages with no electricity or heavy

power cuts face far more challenges in their day to day life. Electricity shortage also affects healthcare directly. Because, if there is a power cut during one's dinner, one is unlikely to enjoy one's meal. This was a major reason why cheap solar lights were provided in the area," explains Sant Kumar, a Jan Swasthya Sahyog activist.

For the last three years, Jan Swasthya Sahyog has assisted with making solar lights available in villages in Lormi region of Mungeli District and Kota region of Bilaspur



district. Though the cost of one solar light is Rs 500, for health activists it is available for Rs 250 and for villagers, at a nominal rate of Rs 100.

The government's Electricity Department has its own solar plant in villages with no power supply. Unfortunately, it often remains switched off during the monsoon season as the sun is not visible for many days at a stretch. Ironically, it is that time of year when people actually need more power. Adiwasis are used to sleeping on the ground without beds or cots (*charpais*) and hence often become victim to snake or scorpion bites. The presence of

solar lights could easily prevent this hazard. Explains Sant Kumar, "The light we provide saves energy. Once the battery is recharged, it can work for two days. This light can also be charged in the cloudy season."

Located amid lush green forests is the picturesque village of Chiraigoda, with wooden houses constructed far from one another, this village is home to the Uraon Adiwasis. "I have two solar lights, of which only one is in good condition. It helps my children to study after dark and in the preparation of food. It has also made our night trails easier, helping us keep a check on our fields. Paddy seeds can be threshed in the light of a solar bulb. Often, we hang the solar light on trees to keep the wild animals at bay," shares Dhaniram Ekka, a local adivasi, with evident satisfaction.

He adds, "Earlier, we would never receive adequate kerosene from the ration shop, only a litre a month. Those were difficult times."

"The service provided by government solar plants is not satisfactory as they remain inactive for want of repairs. Jan Swasthya Sahyog purchased the plant from a Mumbai based company that has given one year's guarantee and if it gets faulty during the year, the company will either replace it or repair it. In future, we wish to train a mechanic who can repair it locally," shares Sant Ram.

Indeed, as villagers become comfortable with the new eco-friendly technology, a brighter future lies ahead for them and the planet.

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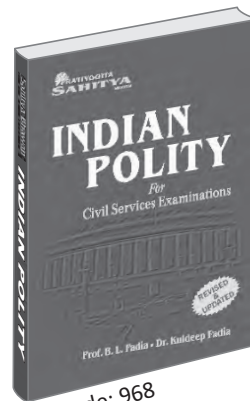
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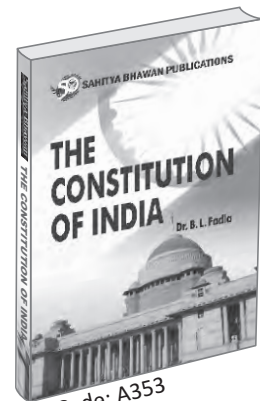
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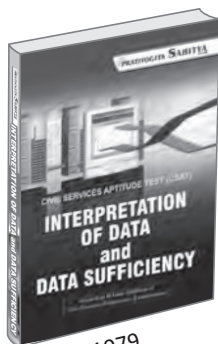
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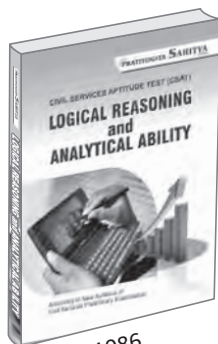
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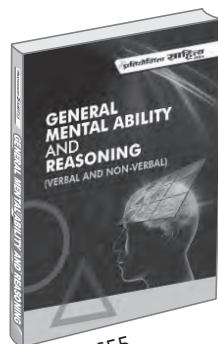
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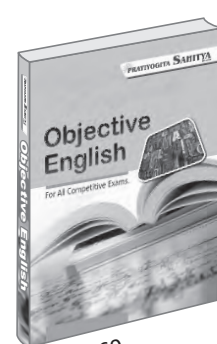
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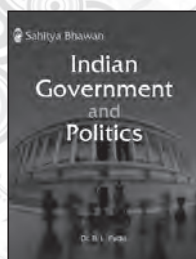


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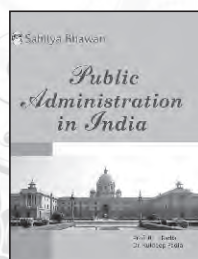


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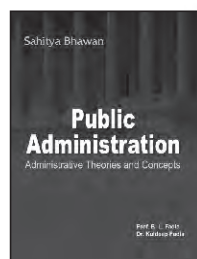
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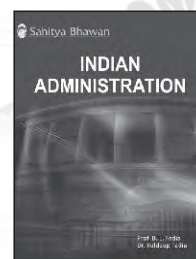
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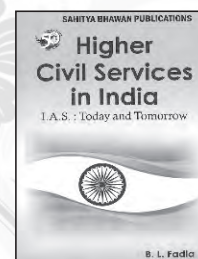
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DO YOU KNOW?

Heartbleed Bug

Heartbleed is a new kind of computer virus that exploits a vulnerability in computer software to gain unauthorized access to the user names and passwords stored on the internet. Strangely, the bug has been discovered in the cryptographic software Open SSL which is used to secure communication over the internet for applications such as email, instant messaging, VPNs and the web. Open SSL has a feature called 'Heartbeat' that allows a computer at one end of an encrypted link to transmit occasional signals to the computer at the other end to confirm if it's online. This feature has been utilised in the Heartbleed virus to steal all data from a remote computer.

Also termed as a 'catastrophic bug', the Heartbleed virus has impacted almost every company in the world concerned with security software. This vulnerability can let the attacker get the information such as web-server private keys and user passwords, that particularly need the hardest protection. According to the sources, India received more than 5 per cent of the total attacks as far as mobile malware is concerned. Heartbleed bug affected many Indian websites with a .in domain and left over 611 websites vulnerable. Even the smartphones are equally susceptible to this bug as the mobile apps are also connected to online servers to complete the functions.

However, researchers have created a technique named 'Red Herring' which creates decoy server to trap the unauthorized hacker trying to gain control over confidential and secure information. It works as a honeypot that mimicks a real webserver but actually monitors the misdeeds of the person trying to break into a computer and helps in tracking them to their source.

The only cure for this bug, according to the experts, lies in using strong passwords, specific to each account and updating them regularly. Tumblr, a blogging service of Yahoo has asked its users to update passwords for all the secure online services possessing private data.


m-Wallet

m-Wallet stands for mobile wallet which is also known as mobile money transfer and mobile payment.

Even though payment through credit cards, debit cards and other electronic devices have been in use for a long time now, the m-Wallet allows consumer to use a mobile phone or Tablet to pay for a wide range of services and goods.

M-wallets are just like prepaid cards because they have to be loaded with money prior to making their transactions and they can be accessed with full security from the mobile device itself. M-wallet can be topped up through a cash payment at the relevant bank or even by a loading partner. Even the employees can get their salaries credited to their M-wallet through bank transfer. The services can be availed as soon as the money is loaded into the account of M-wallet and the user can easily pay off for the goods as well as services and transfer money from his M-wallet by an SMS or through Near Field Communication (NFC). The M-wallet serves as an excellent tool to expand the business by employing innovative marketing strategies. The payment through the M-wallet is also a more secure and easier way for the customers.

This payment mode is slowly being employed specially in developing countries where as much as half of the population does not get to avail the banking facilities. This can easily reach the masses and help achieve the target of financial inclusion even in the villages where people have phones but no bank branches exist to cater to their financial needs. M-wallet facility can make all their micropayments. And, Though new and not widely spread as yet, they are expected to make their mark with more subscriber awareness and pricing. Being easier to use by both sender and the receiver, they are capable of becoming the standard payment method, enjoying better status than even the prepaid cards.

The size of the mobile payment market in India is still small at \$86 mn (2011) but it is expected to touch \$1.15 billion in 2016 at a CAGR of 68 percent. Globally, the mobile payment market was expected to exceed \$300 billion by 2013. Reserve Bank of India (RBI) has initiated steps to promote the mobile payment segment through certain favorable regulatory initiatives. It has relaxed m-payments transaction limit to 50,000 per person per day. The mobile operators, kirana stores, and corporates are allowed to act as business correspondents. 

*(Compiled by Vatica Chandra,
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