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Indian Agriculture after Liberalisation

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This paper examines broad trends in agricultural output growth, food prices and the viability of cultivation over the period of liberalising economic reforms in India since the early 1990s. These trends are considered in relation to the current perceptions of agrarian crisis in India and the degree to which the economic liberalisation process may have contributed to this crisis. The relationship between patterns of cultivation and technological changes as well as environmental concerns is also highlighted.

Keywords: Agricultural Growth, Liberalisation, Food Prices, Economic Reforms

I. INTRODUCTION

Although Mahabub Hossain's work was mainly on technological progress in rice-based agriculture, his broader interest in pro-poor growth took him into the various linkages that agriculture has with more general growth processes and their impact on poverty. All three issues were of abiding interest to Mahabub, and also remain critical to understanding agrarian change in any economy. This paper attempts to consider some of these issues in the context of Indian agriculture over the past two decades. Specifically, this paper considers some of the issues around technology use in agriculture, high food price inflation and the "agrarian crisis." To set the context, the paper begins with a discussion of the broader trends in agriculture and in policies towards that sector in India over the past three decades.

II. AGRICULTURE AND "ECONOMIC REFORMS"

In July 1991, when a devaluation of the Indian rupee presaged the introduction of a whole series of liberalising economic reforms, agriculture was very far from the minds of most policymakers and commentators. The immediate focus was on the balance of payments, and thereafter on industry and other sectors like "modern services." Indeed, subsequent policy measures, oriented

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towards trade and foreign investment liberalisation and deregulation of domestic industry and then finance, tended to reinforce the emphasis that was being put on non-agricultural sectors as the means to both faster economic growth and development in terms of structural transformation.

The basic philosophy underlying this was relatively simple, and remarkably it has scarcely changed in essence in the decades thereafter, despite the succession of different (and politically quite opposed) governments that have been in power at the Centre. The economic strategy is one that pins its faith on large investments by private corporate capital that are expected to deliver both more rapid growth and more formal employment with diversification out of lowproductivity primary activities and petty services. To that end, various shackles on such capital, in the form of internal and external regulation, were sought to be removed and, in addition, various incentives were provided over time to encourage more rapid rates of private investment. The strategy offered less to small-scale production, whether in agriculture or other activities, since the implicit idea seemed to be that the process of growth would render much of such production archaic and lead to more formal employment in large-scale enterprises across all sectors. Obviously, that expectation is very far from being met; but the underlying premise still seems to pervade the perceptions of economic policy makers in India, such that small and micro-enterprises (which very much also include peasant producers) have largely been ignored or even discriminated against by the very unfolding of the reforms.

In the initial years, the reforms package did not include any specific policies specifically designed for agriculture. In the early 1990s, it was felt that the devaluation of the rupee had already provided sufficient incentive to agriculture, because it was expected to make it more attractive to export crops and thereby improve farm incomes. Subsequently, the presumption was that freeing agricultural markets and liberalising external trade in agricultural commodities would provide price incentives, leading to enhanced investment and output in that sector, while broader trade liberalisation would shift inter-sectoral terms of trade in favour of agriculture. However, even if no explicit attention was paid to agriculture, various economic policies and other changes in patterns of government spending and financial measures had significant implications for the conditions of cultivation. These were often quite different from those that had been anticipated by the architects of the reform process. There were four important policy areas that had effects on agriculture, many of which were

adverse for the first decade or more, and then had to be corrected or reversed in the mid-2000s. These relate to public expenditure, access to institutional finance, trade liberalisation and food management.

III. FACTORS AFFECTING AGRICULTURAL OUTPUT GROWTH

3.1 Public Expenditure and Access to Institutional Finance

Over the initial period of economic reforms, which coincided with government attempts at fiscal stabilisation, there were actual declines in government expenditure on agriculture and rural development. Thereafter, there were cuts in particular subsidies such as on fertilizer in real terms, and the 1990s experienced overall decline in per capita government expenditure on rural areas in both absolute per capita terms and shares of GDP and aggregate public spending (Chandrasekhar and Ghosh 2004). Associated with this, there were also very substantial declines in public infrastructure and energy investments that affect the rural areas. These were especially marked in irrigation and transport, both of which matter, directly and indirectly, for agricultural growth and productivity through their linkage effects. In addition, financial liberalisation measures, including the emerging scope of what was designated as "priority sector lending" by banks, effectively reduced the availability of institutional credit. Although the problem of credit access to cultivators was far from solved in India, the nationalisation of banks had caused some positive differences, as public sector banks made more efforts to open rural branches and rural accounts, and to provide more crop loans to farmers. But after 1993 in particular, various financial liberalisation measures, and the explicit and implicit incentives provided to public sector banks, made this much less attractive for bankers who anyway faced very high transaction costs when dealing with agricultural lending. The growth of branches, accounts and lending to agriculture- all decelerated and in some states showed absolute declines. This forced many cultivators, particularly smaller famers, tenant farmers and those without clear titles to land, to seek recourse to informal channels of credit like input dealers and traditional moneylenders. All this made farm investment and working capital for cultivation more expensive and more difficult, especially for smaller farmers. Inputs for cultivation became a particular concern, as public extension services no longer provided adequate information, access to subsidised quality inputs was reduced, and various subsidies were sought to be lifted. Spurious seeds, greater reliance on expensive seeds provided by large domestic and multinational companies that involved "terminator genes" that did not allow subsequent local reproduction,

problems with price and quality of fertilizer and pesticides and excessive use of both, often in wrong proportions: all of these became frequent problems that affected the quantity and quality of output as well as the margins available to farmers.

All these forces led to a slowdown in agricultural growth (apparent from Figure 1) and by the late 1990s, widespread distress in the countryside. The most extreme form of expression of such distress was in the spate of farmers' suicides, which occurred typically when heavily indebted farmers whose farms had lost viability could find no other recourse. By the mid-2000s, it was evident that the problems facing agriculture were severe and would require express policy attention. The Congress-led United Progressive Alliance (UPA) government that came to power in 2004 had in fact made the problems facing cultivation and rural distress generally a major plank of the electoral campaign, and they sought for some years to reverse the pattern of declining public spending, with increased public investment on irrigation and rural infrastructure and more central government spending on agricultural research and extension, as well as increased credit to rural areas. These positive changes were limited in extent, but they did partially reverse the trend of rural decline, aided by high and rising prices of agricultural goods in global trade. However, by the end of the decade of the 2000s, these forces were also somewhat spent and such expenditure also wound down, just as it did for spending on the rural employment programme, which peaked in 2010.



FIGURE 1: GDP Growth Rates for Agricultural Value Added (CAGR %)

Source: CSO National Income Accounts.

Note: CAGR= Compound annual growth rates based on three year averages of the first three years of the decade.

3.2 Trade Liberalisation

Liberalisation of external trade became an important element of the reform process, first, through lifting restrictions on exports of agricultural goods, and second, by shifting from quantitative restrictions to tariffs on imports of agricultural commodities. A range of primary imports were removed from the list of those controlled and channelled by state agencies and thrown open to private agents. Import tariffs were very substantially lowered over the decade. Exports of important cultivated items, including wheat and rice, were freed from controls and subsequent measures were directed towards promoting the exports of raw and processed agricultural goods.

Indeed, the GATT Uruguay Round agreement required this liberalisation of agricultural trade, but, over the 1990s, most policymakers in India seemed to think that this posed no threat to farmers, since, in the early 1990s, most domestic crop prices were well below international prices. The initial round of tariff binding commitments to the World Trade Organisation (WTO) made by India reflected this misplaced optimism: the country agreed to zero tariff bindings (maximum permitted levels of import tariffs) for a wide range of crops. It was only as global prices fell precipitously that the adverse implications for imports and on farmers' livelihoods became apparent. India was forced to go back to the WTO and renegotiate more appropriate tariff bindings for crops like wheat, rice, sugar and oilseeds. What this meant was that Indian agriculturalists were increasingly exposed to global competition even as the protections they had in terms of support prices, input assistance and public extension services were gradually being reduced or even withdrawn. The international competitiveness of Indian agriculture became more critically dependent on world price movements that were even more volatile than domestic prices. This made it unlikely that more open trade would automatically stabilise domestic prices or ensure that farmers get adequate incentives or even the correct price signals for the future.

3.3 Food Management

Indian farmers, therefore, faced much greater volatility in a more unprotected environment, since this led to a peculiar combination of low prices and output volatility for cash crops. While output volatility increased, especially with new seeds and other inputs, the prices of most non-foodgrain crops weakened, and in some cases plummeted. Further, farmers were squeezed as input costs kept rising, either because of reduced subsidies and rising input prices, or because of the need to use more and more inputs (such as seeds, fertilizer and pesticides) to achieve the same levels of output. This reflected not only domestic demand conditions but also the growing role played by international prices consequent upon greater integration with world markets in this sector. The stagnation or decline in the international prices of many agricultural commodities from 1996 to 2002 meant that their prices in India also plummeted, despite local declines in production. This was not always because of actual imports into the country: the point about openness is that the possibility of imports or exports can be enough to affect domestic prices at the margin. So, today Indian farmers have to operate in a highly uncertain and volatile international environment, effectively competing against highly subsidised large producers/agri-businesses in the developed countries whose average level of subsidy amounts to many times the total domestic cost of production for many crops.

However, the period was still associated with the diversification of crop output. This is indicated in Figure 2, which shows the growing significance of cash crops in total agricultural production. It is apparent that, over the decades, all cash crops' production increased faster than that of foodgrains. The biggest increase is apparent in horticultural activity, through the production of fruits and vegetables. This is obviously a positive development, although the data for such output do need to be taken with a pinch of salt, as they are mostly estimates that are not based on the same systems of assessment that are used to derive the other agricultural production data. Sugarcane and fibres (mainly cotton) also show a substantial increase, but mainly in the 2000s. However, oilseeds production continues to remain a pressing concern, despite recent increases.





Source: Economic Survey 2015-16, Statistical Appendix.

The relative failure of production has been in essential food grains. Figure 3 shows how the rates of growth of production of all the essential cereals fell in the 1990s compared to the 1980s, and turned negative with respect to some of the traditional staples that are now recognised to be nutritionally valuable. The recovery in the subsequent decade was the result of active government intervention that in effect involved reversing several of the measures undertaken over the 1990s.





Source: Economic Survey 2015-16, Statistical Appendix.

The inability to resolve the pressing concerns with respect to food production, distribution and availability is one of the important failures of the entire economic reform process. Figure 4 shows how per capita food grain availability, including both cereals and pulses, has continued to decline over the period of neoliberal economic reforms. The inadequacies and failures of the public distribution system (PDS) for food procurement and distribution, which were amplified in the 1990s when the central government sought to complicate it through the targeted PDS and in other ways reduced its efforts to strengthen and expand it, had the unfortunate effect of making basic food consumption more difficult and even unattainable for the poor. This, combined with the rise in food prices in the 2000s, had very adverse effects on household food consumption in

both rural and urban areas, as our sample surveys tell us. The *National Food Security Act*, which was unanimously passed in Parliament in 2014, was a recognition of that failure, and an acknowledgement that this is an area that necessarily requires active state involvement if every person in the country is to be adequately nourished.



FIGURE 4:Per Capita Availability of Foodgrains (gms per day)

Overall, agriculture, like other economic activities in India, has displayed growing inequalities, in terms of regions and areas, as well as within areas across different categories of cultivators. There are some farmers, typically those who have access to capital and can occupy larger holdings, who have been able to take advantage of new opportunities in horticulture and other cash crops and are showing more profitability. There are others, especially those operating small or medium sized holdings, who are facing growing difficulties of the viability of cultivation, with costs rising often beyond the prices that they are able to command for their crops. There are some areas of relative prosperity and large regions of extreme agrarian distress. Ironically, some of these, such as parts of rural Punjab, are areas that were earlier seen as oases of prosperity. But others are in the mainly rain-fed dry land regions in the heart of India, where cultivators have now faced decades of severe material pressure and even hardship, as discussed below.

Source: Economic Survey 2015-16, Statistical Appendix.

IV. NATURE OF TECHNOLOGY IN INDIAN AGRICULTURE

For obvious reasons, technology is the key to growth in agriculture because natural resources in themselves impart strong decreasing returns. In the Indian case, this particular constraint was, for a time in the 1970s and the early 1980s, apparently overcome by the green revolution technology, particularly in irrigated areas. The HYV-based technology, its pace of progress and impact on equity have been much studied, including by Mahabub Hossain himself. However, it was evident that this had reached a plateau by the end of the 1980s, in terms of the ability to generate yield increases. Since the green revolution technology was confined to irrigated areas and had already been adopted on most such areas by the end of the 1980s, the impetus of this powerful technology shifter petered out. This was partly because public investment in agriculture declined absolutely during the 1980s (Bhalla 1995) and showed no subsequent improvement in the 1990s (Chadha 2003, Ramasamy 2004). A consequence of this was that area under canal irrigation, which had more than doubled between 1950 and 1990 and was the main traditional driver of Indian agricultural growth, stopped increasing thereafter. Over time, this led to over-dependence on tubewells, which willy-nilly became the source of all subsequent irrigation increase, with dangerous ecological consequences.

The technological neglect of dryland agriculture in turn had consequences elaborated below. It is only in the 1990s that some attention was focused on the small-farmer economy in rain-fed areas, although other policy measures in this period (as noted previously) operated against them. The importance of common property resources, both for the environment and the economy, was inadequately recognised by both analysts and, more importantly, by public policy. Therefore, the inevitable conflicts of interest in this context were also not fully appreciated. Thus, as the total social benefit of a hectare of forest hugely exceeds that of best cultivated land, Nadkarni (1996) noted that higher private returns to cultivation after green revolution may have increased encroachment of forests just as it had encouraged privatisation of common property resources, which therefore proceeded apace. It appeared that the only private investments that would make small dryland farmers viable with available technology were in horticulture and livestock, which were both relatively capital intensive, with longer gestation lags, and, therefore, unlikely to be forthcoming. In the event, livestock sector growth decelerated quite significantly during the 1990s before accelerating somewhat after 2005.

This is the context in which new developments in biotechnology appeared to provide some way out of the technological impasse. In the initial phase, a lot of optimism greeted this "science of the future" (Jha 2001). It has been argued that Bt cotton adoption and the associated output increase provided a technological shift almost as iconic as the green revolution (Ahluwahlia 2008), but differences of opinion do persist on Bt cotton, particularly under unirrigated conditions and on India's use of Bthybrids rather than Btvarieties. There has been even greater controversy around Btbrinjal seeds, although this may have been more political than economic. Also, anti-competitive behaviour of multinational companies and even of some domestic seed companies has caused some State governments to intervene on Bt seed pricing.

However, these crop-specific advances, enabled by seeds based on genetically modified organisms (GMO), were not sufficient to counteract the broader adverse impacts of the very serious depletion of water and degradation of land that had occurred after the green revolution. Thus, not only did Indian agriculture enter the 1990s with the green revolution impetus almost over, it faced the costs imposed on natural resources by that legacy. At the end of the decade, there was notable deceleration in growth of total factor productivity (TFP), (Jha 2001, Desai 2002, Ramasamy 2004). Therefore, it is possible that upward shifts in the supply curve may have reduced in the post-liberalisation period due to a combination of lower public investment, exhaustion of the green revolution technology and natural resources degradation. However, TFP estimates differ considerably from study to study, and although there is near consensus on some deceleration after liberalisation, the latest studies suggest that the worst TFP performance was from 1997 to 2004 and that TFP growth recovered strongly after 2004 to above pre-liberalisation rates.¹ While natural

¹Ramasamy (2004) reports TFP growth of 1.4 per cent, 2.0 per cent and -0.9 per cent per annum during the 1970s, 1980s and 1990s. Bosworth, Collins and Virmani (2007) report 0.9 per cent during 1973 to 1983, 1.2 per cent during 1983 to 1993, 1.3 per cent during 1993 to 1999 and -0.4 per cent during 1999 to 2004. The Planning Commission (2013) reports the following rates of TFP growth: 0.8 per cent during 1967/68 to 1980/81, 2.2 per cent during the 1980s, 1.8 per cent during 1991/92 to 1996/97 and 1.4 per cent, 0.6 per cent and 2.0 per cent during the Ninth, Tenth and Eleventh plan periods respectively. USDA (2014) reports TFP growth for India at 1.0 per cent during the 1970s, 1.3 per cent during the 1980s, 1.1 per cent during the 1990s and 2.6 per cent during the 2000s. Since USDA reports annual TFP data, this can be broken down. TFP growth works out to 1.5 per cent for 1991-1996, 0.4 per cent for 1997-2003 and 2.9 per cent for 2004-2011.

resource depletion is certainly a matter of utmost concern, reinforced by climate prospects, the post-2004 revival could provide some cause for cautious optimism, especially as this revival was much more in commodities and in areas not covered by the green revolution, i.e. in horticulture, livestock and rain-fed crops, and involved higher crop productivity driven mainly by technical change (Joshi 2014).

The mentality of intensification of input use, which has dominated farmer behaviour over much of this period and been abetted by public policy, has certainly had damaging ecological consequences. In many areas, further intensification of input use within the green revolution technology now yields negative returns if externalities of natural resource depletion are factored in.Soil quality has worsened due to excessive chemical use over long periods as well as erosion and water logging in some areas. Irrigation is both scarce and ever more expensive, as declining water tables make the use of groundwater the privilege of those who are rich enough to keep digging deeper and deeper to extract it. Clearly, in any case, water is likely to be the major constraint to future growth. The emergence of new pests resistant to chemical pesticides and the uneven performance of genetically modified (GM) seeds that are supposed to reduce reliance on chemicals have complicated the possibilities of pest control, and thereby affected crops. Therefore, although the aggregate supply curve continues to shift up, it may be becoming flatter or price responses along it might now involve larger lags.

All these concerns point to the need for much more research on the nature and implications of technological change and a change in orientation of technology towards the specific and changing needs of small farmers, especially in dryland areas. They also bring out the limitations of price and subsidy policy for agriculture. This not only requires re-orientation of subsidies but also institutional support for collective action to sustain natural resources and to preserve the commons without undue privatisation. However, although the supply curve appears to have become more flat and lumpy, the post-2004 performance suggests that there is considerable room to shift this up with adequate public investment in infrastructure and on research and extension. Further, this discussion has obvious implications for inflation, since it means that similar shifts in demand can now cause prices to rise more than earlier. This is considered below.

4.1 Food Price Inflation

Post-liberalisation food inflation has been very high, averaging double digit from 1990 to 1999 and again from 2005 to 2014. Of course, it is true that inflation is in large part a monetary phenomenon, and typically not an area of expertise of agricultural economists. But agricultural economists still owe an explanation in terms of relatively higher inflation of *real* food prices (defined here as WPI for Food Articles deflated by WPI for all commodities). This had averaged negative (-0.3 per cent per annum) during 1970-1971 to 1990-1991, but became significantly positive (2.2 per cent per annum) during 1991-1992 to 1998-1999. It did turn negative again (-2.1 per cent per annum) from 1999-2000 to 2004-2005, but then rose very sharply to 3.4 per cent per annum during 2005-2006 to 2013-2014.

The problem here is that the usual explanation, that real food prices rise when food output grows lower than domestic demand, does not work very well for the post-liberalisation period. For example, foodgrains production and real foodgrains prices had both increased (at 1.8 per cent and 1.9 per cent per annum respectively) between 1990-1991 and 1998-1999, but both fell during 1998-1999to 2004-2005 (-0.4per cent and -1.9 per cent per annum respectively) and then both rebounded sharply, upto 2.9 per cent and 2.8 per cent per annum during 2004-2005 to 2013-2014. These outcomes which all indicate positive correlation between prices and production are very different from those observed before liberalisation when growth of food production correlated negatively with real food prices (e.g. real foodgrains prices had declined at -1.1per cent per annum during 1970-1971 to 1990-1991 as foodgrains production grew at 2.5 per cent per annum). Thus, while pre-liberalisation price changes were quite consistent with shifts (due to technology or weather) of the supply curve along a fairly stable demand curve, post-liberalisation outcomes appear more consistent with demand shocks along the supply curve.

So, what are the concerns on the demand side? An early consideration by Bhalla (1995) raised almost all relevant issues. Discussing the implications of liberalisation, he expected agriculture's terms of trade to improve with reduced industrial protection but cautioned against too much optimism based on the liberalisers' line of argument of strong response of output to prices. He noted with concern that a deceleration of foodgrains growth was being addressed by large increases in Minimum Support Prices (MSP) rather than by non-price supply-side interventions, and also warned that world food prices were subject to much greater variability than Indian prices before liberalisation. In other words, he pointed out that unlike consumer demand for food, which normally grows in a fairly stable manner with population and income, both high procurement due to active MSP policy and post-liberalisation openness to world trade could turn out to be large additional demand shifters which were also less stable. He also went on to project much higher future demand for food grains than others, mainly because of feed requirements to meet much faster growth of demand for livestock products. Overall rather pessimistic on food supply being able to keep pace with demand in a non-inflationary manner without much larger public investment and research effort, he argued that benefits from liberalisation in the form of higher exports should be dealt within "vent for surplus" terms.

This was prescient on MSP and trade. MSPs were indeed increased much more post-liberalisation, averaging well above general inflation unlike earlier when they increased at lower rates. The two main episodes were from 1992 to 1998, when rice and wheat real MSPs increased about 15 per cent; and again from 2006 to 2012, when real MSPs increased over 25 per cent. Although real MSPs declined somewhat during 1999 to 2006, the overall post-liberalisation increase was over 40 per cent. The result was a doubling of the ratio of procurement to output from about 15 per cent in the 1980s to over 30 per cent by 2010, which was sometimes so sharp that in several years, the increase in public stocks absorbed more than the increase in cereals production. But this was demand that could not be sustained smoothly, and was cyclical because MSPs had to be restrained when stocks became too high. Also, food exports (including all food, not just cereals, but excluding tea and coffee) increased from about 2 per cent of value of production before liberalisation to over 12 per cent currently. With total domestic food demand unlikely to have increased less than the growth of agriculture after 1990, this was significantly additional demand and more than just vent for surplus. But, again, export growth was not smooth but rather correlated with variations in world food prices. In particular, the initial spurt in export share after liberalisation, from 2 per cent to 6 per cent of production during 1991 to 1996, occurred when world food prices were rising. But the share stagnated below 6 per cent during 1997 to 2003 when world food prices fell, to rise again from 6 per cent to 12 per cent during 2004 to 2013 when world prices rose very sharply. These two shifters highlighted by Bhalla were clearly new and large demand-side contributors to the higher post-liberalisation real food

inflation. Their impact also helps explain why food inflation dipped from 1998-1999 to 2004-2005 when TFP decelerated, but flared up subsequently, despite TFP acceleration.

Bhalla's projection of growth of cereals demand was a counter to those who were then arguing that per capita cereals demand was likely to decline and that, therefore, focus should shift to crop diversification. However, interestingly, despite actual outcomes on cereals demand appearing to have proved Bhalla wrong, most subsequent analysts have continued to put primacy on meeting cereals requirements (for example, Patnaik 2007). There is obviously consensus on cereals self-sufficiency and a continued concern with food security, especially since the existing low calorie intakes did actually decline after 1991 because of declining per capita cereals consumption. But this is no justification to combine large procurement at high MSPs with a narrowly targeted Public Distribution System (PDS). This only depresses calorie intakes further by raising prices and leads to excess stocks which are then exported, sometimes with large subsidy. There is, therefore, an issue not only with India's food management policies but also about whether agricultural policies may have overdone the emphasis on cereals and, in this context, whether MSPs for cereals may have discouraged production of other commodities with greater demand.

In contrast to Bhalla, who had opposed generous MSP awards both because of their price implications for the poor and because he was sceptical of output response to higher prices, others like Acharya (1997) put up a defence of MSP policy. He argued that there was in fact significant price response, although this was more a step-function instead of being smooth and that, therefore, some periods of high stocks were both inevitable and necessary. He also pointed out that post-liberalisation MSP policy had to cope with larger cost escalations, due to otherwise desirable reduction in input subsidies. The broad tenor of his argument was that MSP policy had to manage a transition from a subsidy-based low-cost low-price situation to a more efficient higher cost higher price one. While improvement of markets and their efficiency, especially for commodities not covered by MSP, was vital to this effort, it was also necessary to protect the incomes and incentives of farmers who actually sold at MSP and provided much of the marketed surplus. This remains an unresolved area, especially since the large MSP increases after 1991 occurred, while subsidies to fertilizer, power and water continued to rise despite sporadic efforts to restrain these and their negative environmental effects.

On the demand side, there appears to be consensus that Indian agriculture has become more vulnerable to vagaries of international markets and that its ability to respond to changes in the composition of demand is being hampered by uneven MSP operations across crops and regions, inadequate logistic capacity to handle perishable commodities and the continued presence of local oligopolies. At least some of the high food inflation in the post-liberalisation period could have been moderated if there had been better co-ordination on policies regarding MSPs, subsidies, international trade and the regulation of domestic markets. However, progress has been slow not only because different interest groups back different policies but also because, despite considerable consensus, agricultural economists and policy makers have not agreed sufficiently on the right policy mix.

4.2 The Agrarian Crisis

Since the mid-1990s, the media and some academics have been repeatedly raising concerns about the agrarian crisis, involving rising cases of farmer suicides and other evidence of farm distress. It is true that suicides have multiple causes and, therefore, no strong direct causal relationship needs to exist between economic conditions and incidence of suicides. Moreover, doubts have been cast on whether incidence of suicides among farmers is at all higher than among the general population, and much depends on definition of farmers in the relevant statistics, as there tends to be exclusion of women, tenants and agricultural workers in the number of suicides while all those engaged in farming are typically included in the denominator (Nagaraj et al. 2014). This may be why the number of farmer suicides increased 70 per cent between 1995 and 2004, after which it declined almost equally sharply. Chand, Saxena and Rana (2015) have correlated this with deceleration in growth of real income per farmer from 2.7 per cent per annum during 1983 to 1994 to 2.0 per cent during 1994 to 2005, and subsequent acceleration to 7.3 per cent during 2005 to 2012. Similarly, Joshi (2014) associated agrarian distress with growth stagnation due to frequent droughts and floods and an uncertain global economic environment, which, he hoped, was left behind by the revival of agricultural growth after 2004.

However, the impression of an "agrarian crisis," as discussed by civil society and the media, extends beyond farmer suicides to matters such as poverty as well as the viability of farming and insecurities associated with it. Chand *et al.*'s results quoted above also show that real per farmer incomes were increasing

when suicides were rising, albeit at a lower rate than earlier and, of course, much less than in the subsequent period, 2005 to 2012, when high TFP growth, improved terms of trade and a shift of workers in farming families from cultivation to other activity all contributed to an unprecedented growth of per farmer incomes. Nonetheless, some types of extreme distress did increase even as average farm incomes were rising. Part of this could be due to rising inequalities as Thorat (2011) suggests, although no evidence correlates low levels of incomes with high suicide rates, and it is not the case that suicides were more among the poorest farmers. The only robust fact in this context is that a significant proportion of farmer suicides were of those unable to service their debt because of an unanticipated fall in income due to fall in output and/or fall in price of output. But, as Thorat (2007) noted, only half of all farmers are indebted since the rest, almost all small and marginal, do not have access to credit even from moneylenders. Given all this, there is some reason to link distress to droughts, floods and global economic uncertainty, which had combined to create a situation during 1995 to 2004 when many farmers who had borrowed to expand into relatively capital-intensive activities, particularly in rain-fed areas, had faced situations when both output and price fell.

However, this also means that the post-2004 revival of growth should not be a cause for complacency. First, if anything, the ongoing climate change portends an increase in the incidence of extreme weather events and resulting output shocks. Second, global economic uncertainty is no less today than before 2004. The period from 2004 to 2011 was rather unusual in that world agricultural prices had doubled, and this not only increased domestic prices through trade but also influenced MSP policy. However, the resulting experience with food inflation is now restraining both MSP and monetary policy, and world prices have also fallen by 25 per cent. Given the openness to trade and adoption of inflation targeting as the main objective of monetary policy, the return of simultaneous adverse price and output shocks cannot be ruled out. Whether one chooses to call this a crisis is debatable, but an increase in farming risks is a reality and will continue to have an impact even if the high TFP growth recorded after 2004 is sustained.

The widespread perception of crisis in agriculture has been sharpened by the lack of expansion in productive non-agricultural activities, including on-farm activities like livestock rearing and off-farm employment. The inadequate generation of properly remunerative employment in the economy, which has been an unfortunate feature of the recent growth process, has meant that farmers do not have the real choice of engaging in other work even as cultivation is less profitable. This has added to the insecurity that is created by the threat of involuntary displacement because of the requirements of so-called "development," and at least partly explains the tremendous animosity among farmers to the government's attempt to introduce a new Land Acquisition Bill.

This discussion suggests that, to put Indian agriculture on a more viable and sustainable footing, some policy measures are urgently required in several interlinked areas. These include the need to correct spatial inequities in access to irrigation and work towards sustainable water management; to bring all cultivators into the ambit of institutional credit, including tenant farmers; to shift policies to focus on dry land farming through technology, extension, price and other incentives; to encourage cheaper and more sustainable input use, with greater public provision and regulation of private input supply and strong research and extension support; to protect farmers from high volatility in output prices; and to emphasise rural economic diversification to more value-added activities and non-agricultural activities. We believe that these are all concerns that Mahabub Hossain himself would have shared, as so much of his own work was directed towards ensuring the viability of cultivation – not just as an economic activity, but as a way of life with dignity in a wider diversified economy.

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