Persistence of Crisis in Indian Agriculture: Need for Technological and Institutional Alternatives

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Need for Technological and Institutional Alternatives

Srijit Mishra and D. Narasimha Reddy
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1 Introduction:
There are two dimensions to the current crisis in Indian agriculture, viz., the agricultural and the agrarian. The former is a developmental crisis that lies in the neglect of the sector arising out of poor design of programmes and inadequate allocation of resources. The latter is a livelihood crisis threatening the very basis of survival for the vast majority of the population dependent on agriculture (Government of India 2007, Reddy and Mishra 2009). On the one hand, there is a neglect of farming, and on the other hand, there is a neglect of the farmer. In the developmental discourse these would be contextualized with the displacement of ideology and the displacement of people respectively (Bhaduri 2008). The two dimensions are inter-related in the sense that the problem at the larger structural context cannot be separated from the problem that the individual farmer faces. What is worrying is that this crisis in agriculture, which has been there for nearly two decades now, is taking place at a time when the overall Indian economy, except during the recent global financial crisis, has been witnessing a high growth.

Some aspects of the agricultural crisis are the following. Compared to the 1980s, agricultural production, productivity and value of output from early 1990s, have decelerated for almost all crops. The state instead of facilitating the risk-taking farmers has been withdrawing. There has been a decline of public investment in irrigation and related infrastructure. An increase in private investments on borewells/tubewells in some parts of the country led to a tragedy of the commons through declining water tables. Inadequate access to formal sources of credit led to increasing dependence on informal sources of credit with a greater interest burden. Waning link between research & extension and farming increased reliance on the input provider for advice bringing about supplier-induced-demand. With changing technology and market conditions the farmer is increasingly being exposed to the uncertainties of the product as well as factor markets. The farmer faces multiple risks, vagaries of weather, price shocks, and spurious inputs among others, further compromising on his already lower returns.

On agrarian crisis, we discuss the following. Growth of agriculture sector has been lower than that of the overall economy, but what is worrying is the deceleration in agriculture in the 1990s than that of the 1980s. In 2004-05, the share of agriculture in national income is around one-fifths, but this sector still continues to employ nearly three-fifths of the workers. For the same year, after taking a reduced norm, the incidence of calorie poor is much higher than the incidence of expenditure poor. There has been an increase in marginalization. In 2001, from the total operational holdings, more than three-fifths were with less than one hectare of land and for nearly one-fifths the land-size was between one-to-two hectares. Farmers suicides’, which like indebtedness is symptomatic of the larger crisis, has been showing an increasing incidence and continues to remain much higher than that of non-farmers.
There is need for institutional structures to organize the farmers to help them address their concerns and problems. Concurrently, unlike the green revolution technology which began with large farmers in resource rich areas, community managed sustainable agriculture focusing on marginal and small farmers in resource poor dry and drought-prone areas needs to be promoted.

2 Agricultural Crisis

Production and Productivity:

Coming to agricultural production and productivity, using Boyce (1986) we analyze the kinked exponential growth rate for two periods (Triennium ending (TE) 1981-82 to TE 1993-94 and TE 1994-95 to TE 2007-08) with regard to area, production and yield across major crops (Table 1).

<table>
<thead>
<tr>
<th>Crops</th>
<th>TE 1981-82 to TE 1993-94</th>
<th>TE 1994-95 to TE 2007-08</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>Production</td>
</tr>
</tbody>
</table>
| Foodgrains | -0.3 * | 3.0 * | 3.3 * | 3.0 * | -0.2 * | 1.1 *| 1.3 *| 1.0 *#
| Total Cereals | -0.3 * | 3.2 * | 3.5 * | 3.2 * | -0.2 * | 1.2 *| 1.4 *| 1.1 *#
| Rice | 0.7 * | 3.7 * | 3.1 * | 3.7 * | 0.1 # | 1.0 *| 0.9 *| 1.0 *#
| Wheat | 0.8 * | 4.1 * | 3.3 * | 4.1 * | 0.7 * | 1.6 *| 0.8 *| 1.6 *#
| Coarse Cereals | -2.1 # | 0.4 | 2.5 | 0.5 | -1.3 *# | 0.7 * | 2.0 * | 0.4
| Total Pulses | -0.2 | 1.4 | 1.6 | 1.4 | -0.2 | 0.0 | 0.2 | 0.3#
| Gram | -0.8 | 0.8 | 1.6 | 1.1 | 0.2 | 0.8 | 0.6 *| 0.9 *#
| Tur | 1.6 * | 0.7 | -0.8 | -0.8 | 0.8 * | -0.2 | -0.1 | 0.1
| Total Oilseeds$ | 3.4 * | 6.2 * | 2.9 * | 5.8 * | 0.0 # | 1.2 *| 1.3 *| 0.9 #
| Groundnut | 1.4 * | 2.9 * | 1.4 * | 3.3 * | -2.4 *# | -1.6 *# | 0.9 * | -1.5 *#
| Rapeseed & Mustard | 4.4 * | 8.1 * | 3.6 * | 7.3 * | 0.0 # | 1.2 *| 1.2 | 1.5 *#
| Soyabean† | 16.9 * | 20.1 * | 3.1 * | 20.5 * | 5.3 *# | 6.2 *# | 0.9 *# | 6.3 *#
| Sugarcane | 2.2 * | 4.0 * | 1.8 * | 3.4 * | 1.4 * | 1.2 *# | -0.2 | 1.9 *
| Cotton | 0.2 | 3.2 | 3.0 | 3.4 * | 1.1 * | 3.1 * | 2.0 | 2.9 *
| Jute | -0.8 | 1.8 * | 2.6 * | 1.8 | 0.7 | 2.0 * | 1.3 *# | 2.1 *
| Mesta | -4.0 * | -2.3 * | 1.7 * | -2.6 | -2.8 *# | -1.5 * | 1.3 * | -1.0 *#
| Coconut | 3.7 * | 6.6 * | 2.9 * | 6.4 * | 1.6 *# | 1.5 *# | -0.1 # | 1.7 *#
| Potato | 3.2 | 5.1 * | 1.8 * | 5.2 | 2.2 *# | 3.0 *# | 0.7 *# | 3.1 *#
| Tobacco | -0.6 | 1.6 | 2.3 | 1.5 | -0.9 | -0.5 | 0.4 | 0.5 ##

Note: Growth rates have been calculated using a kinked exponential curve \( \ln(Y_t) = a + b(t_1) + c(t_2) \); \( Y = \) Area, Production and Yield, \( t=0 \) for TE 1981-82 and 26 for TE 2007-08 with TE indicating triennium ending, \( t_1 = \) (d+(1-d)k) and \( t_2 = (1-d)(t-k) \) where \( d=1 \) for the first period (TE 1981-82 to TE 1993-94) and \( d=0 \) for the second period (TE 1994-95 to TE 2007-08) and \( k=12 \) representing TE 1993-94. \( b \) and \( c \) are growth rates for the first and second periods respectively, for Cotton, Potato and Tobacco data are available till TE 2006-07. * indicates that the growth rates are significantly different from zero at 95 per cent confidence interval (CI) and # indicates that the growth rates between the two periods are significantly different from each other at 95 per cent CI. $ comprises of nine major oilseeds. †value of soyabean available from 1980-81, and hence for \( t=0 \) it is a two year average.

In the 1980s, growth in area was significantly negative for coarse cereals and mesta, and not significantly negative for some others. But what is important is that production and yield was significantly positive for almost all crops, except for mesta in production and tur in yield. In more recent years, the significantly negative growth in area continued with coarse cereals and mesta and to it was added groundnut. With regard to production and yield, significantly negative growths were limited to groundnut and mesta for production. But, what is worrying is that the growth rate of production as also yield has been significantly lower for most crops/crop groups when compared with the 1980s.

Growth rate for value of output was also lower in recent years when compared to the 1980s for all major crops/crop groups and the difference was significant for cereals, pulses, oilseeds, coconut and potato. If we take all the major crops/crop groups together then the growth rate per annum for the two periods are 3.4 per cent (CI: 2.9, 3.9) and 1.3 per cent (CI: 0.9, 1.7) respectively. For other crops largely comprising indigo and dyes, drugs excluding tobacco, condiment and spices, fruit and vegetables excluding potato, and by products among others the per annum growth rate for the first period at 1.7 per cent (CI: 1.3, 2.0) was significantly lower than that for the second period at 4.0 per cent (CI: 3.7, 4.3). The latter group of crops constitutes more than two-fifths of the value of output in agriculture, but a rough estimate shows that it comprises less than 15 per cent of the area under cultivation (gross cropped area plus area under miscellaneous trees and groves less area under major crops/crop groups). The cultivation of these being relatively less labour-intensive, the number of man-days spent by cultivators and agricultural labourers in these activities will have a lower proportion than the share of area under these crops.

What is even more alarming is that the growth rate in production for cereals and oilseeds at 1.2 per cent per annum in recent years has been lower than the growth rate of population at 1.9 per cent per annum from 1991 to 2001. There has been no growth in the production of pulses. Overall, deceleration is evident for production, productivity and value of output for almost all major crops/crop groups.

<table>
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<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Cereals</td>
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<td>36.8</td>
<td>31.8</td>
<td>31.2</td>
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<tr>
<td>Pulses</td>
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<td>5.6</td>
<td>4.7</td>
<td>4.4</td>
</tr>
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<td>Oilseeds</td>
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<td>9.3</td>
<td>7.9</td>
<td>8.3</td>
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<tr>
<td>Sugars</td>
<td>4.4</td>
<td>4.6</td>
<td>5.5</td>
<td>5.8</td>
</tr>
<tr>
<td>Fibres</td>
<td>4.0</td>
<td>4.0</td>
<td>3.8</td>
<td>5.2</td>
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<tr>
<td>Drugs</td>
<td>2.4</td>
<td>2.3</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Condiment and spices</td>
<td>3.1</td>
<td>3.6</td>
<td>4.7</td>
<td>4.5</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>18.6</td>
<td>18.8</td>
<td>24.1</td>
<td>24.3</td>
</tr>
<tr>
<td>Others</td>
<td>8.7</td>
<td>6.2</td>
<td>7.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Byproducts</td>
<td>9.7</td>
<td>8.1</td>
<td>6.4</td>
<td>6.0</td>
</tr>
<tr>
<td>Kitchen garden</td>
<td>0.8</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>All</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Note: The figures have been rounded off.

Share of value of agricultural output across crop groups indicates the following (Table 2). The share of cereals declined from the mid 1990s and that of
pulses from the 1980s. The reliance on byproducts and kitchen garden seems to be on the decline. As against these, the share of fruits and vegetables has been increasing. Oilseeds show an increase in the 1980s followed by a decline from mid 1990s and again an increase in recent years – among oilseeds soyabean has been showing an increase from 1980s. Sugars have been showing a consistent increase but the share of sugarcane, its biggest component, decreased during the 1990s. Fibres (largely cotton) decreased during the 1990s, the period that saw an increasing incidence of suicides, particularly among cotton farmers. Drugs show a decrease in the 1980s and an increase in the 1990s. Condiments and spices show an increase in the 1980s and 1990s and some decline in recent years.

**Risks and Vulnerability**

For the current agricultural season of 2009-10, paucity of rain in the initial period has led to drought like conditions and abundance of rain later in the period led to flood like situation in some parts. In monsoon India, this has been a continuing problem. The vagaries of nature, it seems, are likely to increase because of global climate change. Besides weather, pests, disease of plants and spurious quality or inappropriate usage of inputs would bring about productivity and production loss. This affects food security of farmer households. Conventionally, prices largely depended on local demand and supply conditions; its variation did not affect overall returns much. Integration with the global market has increased price volatility and the farmer can face output and price shocks together resulting in substantial reductions in income (Reserve Bank of India 2006, Mishra 2008, World Bank 2007).

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Paddy Common</td>
<td>415</td>
<td>645</td>
<td>850</td>
<td>230</td>
<td>205</td>
<td>55</td>
<td>32</td>
</tr>
<tr>
<td>Coarse Cereals</td>
<td>360</td>
<td>600</td>
<td>840</td>
<td>240</td>
<td>240</td>
<td>67</td>
<td>40</td>
</tr>
<tr>
<td>Maize</td>
<td>360</td>
<td>620</td>
<td>840</td>
<td>260</td>
<td>220</td>
<td>72</td>
<td>35</td>
</tr>
<tr>
<td>Arhar (Tur)</td>
<td>900</td>
<td>1550</td>
<td>2000</td>
<td>650</td>
<td>450</td>
<td>72</td>
<td>29</td>
</tr>
<tr>
<td>Groundnut-in-shell</td>
<td>980</td>
<td>1550</td>
<td>2100</td>
<td>570</td>
<td>550</td>
<td>58</td>
<td>35</td>
</tr>
<tr>
<td>Sunflower Seed</td>
<td>1000</td>
<td>1510</td>
<td>2215</td>
<td>510</td>
<td>705</td>
<td>51</td>
<td>47</td>
</tr>
<tr>
<td>Soyabean Black</td>
<td>670</td>
<td>910</td>
<td>1350</td>
<td>240</td>
<td>440</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>Nigerseed</td>
<td>800</td>
<td>1240</td>
<td>2405</td>
<td>440</td>
<td>1165</td>
<td>55</td>
<td>94</td>
</tr>
<tr>
<td>Cotton (F-414/Med.Staple)</td>
<td>1330</td>
<td>1800</td>
<td>2500</td>
<td>470</td>
<td>700</td>
<td>35</td>
<td>39</td>
</tr>
<tr>
<td>Wheat (Rabi crop)</td>
<td>510</td>
<td>750</td>
<td>1000</td>
<td>240</td>
<td>250</td>
<td>47</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, Various Years (for recent years, [http://dacnet.nic.in/eands/MSP.htm](http://dacnet.nic.in/eands/MSP.htm)).

More over, international prices are distorted because of huge farm subsidies by the developed countries. At the same time, tariff on agricultural imports in India is low. The cushion from Minimum Support Prices (MSP) to farmers is only possible for select commodities and in regions with easy access to designated centres/market yards where one can sell the produce. In any case, the increase in MSP was low. Keeping 1997-98 as benchmark, the percentage increase by 2007 was 55 per cent for paddy, 67 per cent for other cereals, 72 per cent for maize and tur, 58 per cent for groundnut-in-shell, 51 per cent for sunflower seed, 36 per cent for soyabean black, 35 per cent for cotton medium staple and 47 per cent for wheat (Table 3). If one controls for
inflation, then these seem to have decreased during a period when the economy boomed. The farmer household has been having difficulties in providing for normal activities like education of wards, health care of family members and other social obligations.

At a time when returns to cultivation have been decreasing, there is an increasing dependence on the market for inputs. The failure of research and extension service, which is striking in case of crops/cultivation in rain-fed/dry land areas, has resulted in reliance on the unregulated input seller, leading to supplier-induced demand. This is concurrently happening along with deskillling – new technology and new method of cultivation make the accumulated knowledge of social capital on cultivation redundant. From 1990-91 to 2006-07, per annum growth in net area under irrigation was negative from canals (-1.3 per cent) and tanks (-3.5 per cent), and positive for tube wells and other wells (2.3 per cent) and other sources (4.7 per cent). In 2006-07, nearly 60 per cent of area under irrigation was through wells/bore wells. In 1999-2000 prices, public Gross Fixed Capital Formation (GFCF) in agriculture as a per cent of Agricultural GDP declined from 5.3 per cent in sixth plan (1980-81 to 1984-85) to 2.1 per cent in the ninth plan (1997-98 to 2001-02) and then has increased to 3.0 per cent in the tenth plan (2002-03 to 2006-07), calculations are based on data in Government of India (2009). Despite revival in recent years, the inadequate public investment in infrastructure like canals led to private investments in bore wells and along with it a tragedy of the commons (particularly, in Andhra Pradesh) and the reverberations having implications on indebtedness.

With regard to credit, some of the difficulties that a farmer household faces are the following. Credit from formal sources is not available at the appropriate time leading to greater reliance on informal source with a greater interest burden, particularly for the small and marginal farmers. The All India Debt and Investment Survey (AIDIS) of 2003 indicates that for all the outstanding debt from non-institutional sources at the end of June 2002, three-fourths carried interest of more than 20 per cent per annum and of these more than half carried interest of more than 30 per cent per annum. There is difficulty in repayment during crop loss or price shock, but there is no system to address such exigencies through credit guarantee or some such scheme. The more recent debt waiver of 2008 is basically a book-keeping exercise that would clear the non-performing assets of the banks. As a result of this waiver, farmers do not have a loan burden and can avail fresh loans. This was preceded by a doubling of credit, but these just addresses the symptom, not the problem of poor returns to cultivation. More over, such solutions instead of drawing the farmer out of credit, draws them into a vortex of debt. These are further compounded because of market-induced consumerism (Mishra 2008, Reserve Bank of India 2006).

During the 1990s and till a few years ago (about 2004), there were important changes in the banking structure. The number of rural branches declined from 32,981 (51 per cent of total) in March 1996 to 31,967 (46 per cent of total) in March 2005. The number of agricultural borrowal accounts declined from 277.4 lakh in March 1992 to 198.4 lakh in March 2001. Agricultural credit as percentage of net bank credit declined from 18 per cent at the end of the 1980s to 11 per cent in 2004. There was a shift to activities that would give greater returns to banks. Between 1981-82 to 2002-03, distribution of credit disbursed and area operated across size-class of holdings indicate that the ratio of proportion of credit disbursed to proportion of area operated decreased for marginal holdings from 2.41 to 0.98 whereas that of semi-medium and higher holdings increased from 0.72 to 0.93. This means that when the share of area
under marginal holdings is increasing the share of credit disbursed has been decreasing (Government of India 2007, Shetty 2009).

3. Agrarian Crisis

Agricultural GSDP

Growth of Gross (State) Domestic Product (GDP/GSDP) has always been higher than growth in Agricultural GDP/GSDP in all the periods given in Table 4, except for Gujarat in 2000s. At the all India level, the differences between the two have always been statistically significant.

Table 4: Growth Rate of Gross State Domestic Product (GSDP) and Agricultural GSDP across States, 1983-84 to 1993-94, 1993-94 to 2004-05 and 1999-2000 to 2008-09

<table>
<thead>
<tr>
<th>States</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GSDP</td>
<td>AgrGSDP</td>
<td>GSDP</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>4.5 *</td>
<td>3.0 *</td>
<td>5.7 *</td>
</tr>
<tr>
<td>Assam</td>
<td>3.5 *</td>
<td>2.4 *</td>
<td>3.2 *</td>
</tr>
<tr>
<td>Bihar undivided</td>
<td>2.7 *</td>
<td>-1.0 #</td>
<td>4.5 *§</td>
</tr>
<tr>
<td>Bihar</td>
<td>4.5 *</td>
<td>0.2</td>
<td>6.8</td>
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<tr>
<td>Chhatisgarh</td>
<td>3.8 *</td>
<td>-2.4 #</td>
<td></td>
</tr>
<tr>
<td>Gujarat</td>
<td>4.9 *</td>
<td>0.6</td>
<td>6.0</td>
</tr>
<tr>
<td>Haryana</td>
<td>6.0 *</td>
<td>4.7 *</td>
<td>6.0</td>
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<tr>
<td>Himachal Pradesh</td>
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<td>2.9 *#</td>
<td>6.4</td>
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<tr>
<td>Jharkhand</td>
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<td>4.4 *</td>
<td>6.4</td>
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<tr>
<td>Karnataka</td>
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<td>3.6 *#</td>
<td>6.7</td>
</tr>
<tr>
<td>Kerala</td>
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<td>4.6 *</td>
<td>5.6</td>
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<td>Madhya Pradesh</td>
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<tr>
<td>Madhya Pradesh undivided</td>
<td>3.9 *</td>
<td>0.6 #</td>
<td>3.9</td>
</tr>
<tr>
<td>Maharashtra</td>
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<td>5.2</td>
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<tr>
<td>Orissa</td>
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<td>-0.8 #</td>
<td>4.4</td>
</tr>
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<tr>
<td>Uttar Pradesh undivided</td>
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<td>4.3 *</td>
<td>6.8 *$</td>
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<td>India</td>
<td>5.2 *</td>
<td>3.1 *#</td>
<td>5.9 *§</td>
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Notes: GSDP is Gross State Domestic Product and AgrGSDP is Agricultural GSDP, Growth rate calculated using linear trend, $\ln(Y_t)=a+bt+c_t$; b is the growth rate. * denotes growth rate is significantly different from zero at 95% Confidence Interval (CI), # denotes growths rate of Agr GSDP is significantly different from GSDP at 95% CI, § denotes growth rate of 1990s is significantly different from 1980s (which also includes latter part of the 1990s series) is significantly different from 1990s at 95% CI. In 2000s data for Gujarat and Uttar Pradesh undivided are till 2006-07, for Andhra Pradesh Himachal Pradesh, Kerala, Madhya Pradesh undivided, Maharashtra, West Bengal, they are till 2007-08 and for the remaining they are till 2008-09.


With faster growth rate of overall GDP and India as one of the front running emerging market economies the gap between overall growth rate and growth of agricultural GDP is bound to increase and with it the share of agricultural GDP in the national product is bound to decrease. This process may mimic the development path of all developed market economies except that those eking out their livelihood from agriculture remains to be a large workforce and most of them are increasingly small-
marginal farmers and agricultural labourers with severe constraints on earnings and in
meeting their basic consumption needs including food.

From 1993-94 to 2004-05 the share of agriculture and allied activities in GDP
at current prices (1999-2000 series) decreased from 29 per cent to 19 per cent whereas
persons working in the usual principal and subsidiary status on this sector decreased
from 65 per cent to 57 per cent (Government of India 2007). Three-fifths of the
workforce is still dependent on this. For the same period, using shares of GDP and
workforce available across the nine categories of economic activity (agriculture and
allied; mining and quarrying; manufacturing; electricity, water and gas; construction;
trade, hotel and restaurant; transport and communication; finance and banking; and
community and other services) one computes Gini coefficient and observes that
inequality has increased from 0.43 to 0.48. As mentioned earlier, agriculture and
allied category is the only economic activity where its share in GDP is continuously
on the decline and the gap between GDP share and workforce share is continuously
on the increase.

Poor in Rural India

Rural poverty is strongly associated with the state of agriculture. The overall
diminution of the place of agriculture in the national economic performance and the
multitudes of problems faced by agriculture pushing it to serious crisis also reflects in
the distress and deprivation of consumption to fulfill basic energy requirements.

The per capita per annum net availability (excludes seed, feed and wastage
and exports, includes imports and also accounts for change in stock) of foodgrains has
reduced from 177 kilograms in TE 1992 to 159 kilograms in TE 2007 (Government of
India 2009); the growth rate for the period being negative at -0.67 per cent per annum
(CI: -0.91, -0.44). Growth rate in production for milk, egg and fish are positive. Per
capita per annum availability of these is around 90 litres of milk, 45 eggs and 6.1
kilograms of fish in 2006-07. Are these enough? How much of these are available in
rural India? We will try to discuss this indirectly. From 1993-94 to 2004-05 per
consumer unit (as also per capita) consumption of calorie (2683 to 2540 Kcal) and
protein (75 to 71 grams) has decreased and that of fat (39 to 44 grams) has increased
food groups, the decline in calorie (maximal fall to least fall) was in cereals, sugar and
honey, pulses, nuts and oilseeds, and milk and milk products; whereas increase in
calorie (minimum to highest) was in fish, egg and meat, fruits and vegetables, roots
and fibre, miscellaneous items that includes beverages and snacks, and oil and fats.
The decline in pulses as also milk and milk products and the increase in miscellaneous
items and oil and fats are matters of concern from a health perspective.

We make use of household unit level data from the consumption expenditure
schedule of the 61st round National Sample Survey (NSS) in 2004-05 to compute
incidences of expenditure poor and calorie poor across states in rural India (Figure 1).
Incidence of poor is the number of persons in households with monthly per capita
expenditure below the poverty line provided by the Planning Commission. Poverty
lines, first calculated for 1973–4, were used to define the per capita daily calorie
requirements of people: 2,400 calories in rural and 2,100 calories in urban areas (after
adjusting for age and sex composition, it was considered as equivalent to per
consumer unit calorie norm of 3,000 in rural and 2,600 in urban areas). There are
discussions that the calorie norms need a downward revision because of increasingly
sedentary lifestyles and better health and hygiene. In the absence of any guidelines,
we use a consumer unit norm to the existing benchmark of 2400 calorie for rural
areas. This could be on the lower side leading to an underestimation of poor, particularly for groups that continue to put in hard labour. In spite of this self-imposed reduced norm, our incidences of calorie poor (43 per cent) are much higher than the incidences of expenditure poor (28 per cent) for rural India.

Figure 1: Incidences of Expenditure Poor and Calorie Poor across States in Rural India, 2004-05

Among major states, those with incidences of calorie poor higher than the all India average (from high to low) are Karnataka (57 per cent), Tamil Nadu (55 per cent), Madhya Pradesh (52 per cent), Maharashtra (52 per cent), Gujarat (51 per cent), Chattishgarh (49 per cent), Kerala (46 per cent), Jharkhand 45 per cent), Assam (45 per cent), Andhra Pradesh (44 per cent), and West Bengal (44 per cent). The states of Uttaranchal, Orissa, Jharkhand and Bihar have incidences of calorie poor that are lower than their incidences of expenditure poor. Uttaranchal has relatively higher share of calories coming from milk and milk products (10.5 per cent, it is 6.4 per cent for rural India) and sugar and honey (7.6 per cent, it is 4.8 per cent for rural India). What is surprising is that all the other three states are among those having the highest incidences of expenditure poor. This anomaly is because of a relatively higher share of cereals (mostly, rice) in their consumption basket (80 per cent for Orissa, 75 per cent for Jharkhand and 74 per cent for Bihar). In addition, average protein and fat
intake for these three states are among the lowest. These states also spent a larger share of their expenditure on food (62 per cent for Orissa and Jharkhand, and 65 per cent for Bihar, it is 55 per cent for rural India). The other thing is that these three states are perhaps less sedentary and their health conditions are not as improved as in other parts. This is suggestive that, while there is a need to revise the calorie norms downwards, this need not be uniform across states.

From household type (a classification based on occupation), incidences of poor are the highest for agricultural labourers (44 per cent for expenditure poor, 58 per cent for calorie poor); and from size-class of land possessed incidences of poor are relatively higher for marginal holdings (32 per cent for expenditure poor, 47 per cent for calorie poor). A matter of concern is that 70 per cent of the rural population is from households with marginal holdings (0-1 hectares) and half of them being near landless (less than 0.1 hectares of land) and another 15 per cent of the population is from households with small holdings (1-2 hectares). These are households where the working members would be putting in hard labour, and hence, using a common norm will underestimate the incidences of calorie poor. To reiterate, our estimates using a lower calorie norm is only indicative to suggest that in spite of this, incidences of poor are quite high. This is also to suggest that calorie norms need regular updating, but while doing the same one should take into consideration the differences in the sex and age composition, occupational patterns and state specific conditions among others. There should also be norms to take us beyond calories to identify protein, micronutrient or other food based deprivations.

Small and Marginal Farmers

Agricultural census from 1970-71 to 2000-01 show that the distribution of number of operational holdings across size-classes of land possessed has increased from 51 per cent to 63 per cent for marginal holdings (0-1 hectare), has remained around 19 per cent for small holdings (1-2 hectares) and has decreased for all the other size-class of holdings. In 2000-01, semi-medium holdings (2-4 hectares) constitute 12 per cent, medium holdings (4-10 hectares) five per cent and large holdings (more than 10 hectares) at one per cent of the operational holdings. With these shifts, inequality with regard to distribution of land holding decreased from 0.64 to 0.56. Recall that this was happening when inequality in the economy was increasing because of decreasing share of agriculture in the GDP while its share in employment continued to remain high. What is worrying is that most people depended on this sector are largely from households of agricultural labourers and the marginal and small farmers.

The situation assessment survey of 2003 indicated that the average monthly income for a farmer household is lower than its expenditure in case of households with holdings that are marginal (Rs 1,659 and Rs 2,482), small (Rs 2,493 and Rs 3,148), and semi-medium (Rs 3,589 and Rs 3,685); it is higher for households with holdings that are medium (Rs 5,681 and Rs 4,626) and large (Rs 9,667 and Rs 6,418). The latter two constitute less than five per cent of farmer households and even for the large farmer household, average income per month is less than Rs.10000. Average per hectare returns from cultivation was Rs.6756/- in Kharif and Rs.9290 in Rabi. Across states, one observes relatively lower returns per hectare and greater share of expenses in the states of Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Rajasthan and Tamil Nadu during Kharif. This could be indicative of high costs or crop failure. The share of expenses in the value of output is less than 30 per cent in most of the hill states (Himachal Pradesh, Jammu and Kashmir, Jharkhand,
and Uttarakhand) and the north-eastern states, indicating relatively less dependence on market-based inputs (Mishra 2007).

In 2002-03, the average returns from cultivation is Rs.11,259/- per annum per household. If one increases this by one-third (which is on the higher side), to account for the drought of 2002-03, per capita per day returns to farmer households is less than Rs.8/-. Other sources become important, but only 60 per cent and 10 per cent of farmer households take to farm animals and non-farm business respectively and the average monthly returns per farmer household from these two activities are Rs.85 and Rs.236 respectively. This reiterates that non-farm opportunities are limited and income of 83 per cent (94 per cent if one includes the semi-medium also) of farmer households hardly suffice to meet their day-to-day requirements. Forty per cent of farmers indicated that they do not like farming as a profession. From these the most important reason give by more than two-thirds is its non-profitability and another two-fifths considered it risky (Mishra 2007).

Farmers’ Suicides

Between 1995 and 2007, more than 200,000 farmers have committed suicides, 83 per cent of these being males. The suicide mortality rate (SMR, suicide death for 100,000 persons) for male farmers increased from 10.5 in 1995 to 18.2 in 2007 and that for male non-farmers increased from 12.4 to 14.1 (Figure 2). An average for 2005-07 shows that the major states with male farmers’ SMR higher than the national average of 18 are Kerala (275), Maharashtra (60), Chhattisgarh (54), Andhra Pradesh (38), Karnataka (34), West Bengal (22) and Tamil Nadu (21). It is to be reiterated that suicide is a symptom of the larger crisis, and its absence does not in any way indicate the absence of a crisis. What is much more important from the perspective of Chhattisgarh, as also a large part of central India, now under a Maoist-security imbroglio, is the poor returns and absence of quality life for a vast majority. The increasing incidence of farmers’ suicides is symptomatic of the agrarian crisis, but it is also a manifestation of the agricultural crisis. It indicates that for every farmer committing suicide there are hundred thousands more in crisis. Further, the larger malaise or the agrarian/agricultural crisis is not just limited to regions reporting higher suicides. It is much more widespread (Mishra 2009a).

Figure 2: Suicide Mortality Rate (SMR) for Male Farmers and Non-farmers in India, 1995-2007

Source: Mishra (2009a)
4. Technology and Institutional Alternatives

One of the features of the current agrarian crisis in poor returns to cultivation. The technological interventions such as the green revolution meant for increasing productions were neutral to land size in terms of output, but were not neutral in terms of resources making it a costly imperative for marginal and small farmers. In recent years, a number of financial products also were introduced to address uncertainties, but more often than not, they ended up adding to rather than reducing risks (Mishra 2008, 2009b). The need of the hour is reducing costs.

Alternative Technology

Choice of technique, a la Sen (1960), refers to interventions that are either output-enhancing or input-saving. Farmers in many parts of world, including India, have been trying out or need to explore alternatives that reduce usage of input-intensive cultivation, and in the process, reduce costs and risks (Mcintyre et al 2009, World Bank 2007). One of this is non pesticide management (NPM), that is, integrated pest management minus the chemicals. Wherever possible, it also avoids usage of fertilizers. The technology is knowledge centric rather than product centric. Such an intervention in Andhra Pradesh is the Community Managed Sustainable Agriculture (CMSA), which is an activity of the Society for Elimination of Rural Poverty (SERP). CMSA considers soil as a living organism and focuses on enhancing microbial activity and replenishing the nutrients through natural processes to sustain productivity. Some of the non-negotiable practices under NPM are deep summer ploughing, community bonfires, seed treatment, bird perches, border crops, trap crops, yellow and white plates, intercrops, light traps, pheromone traps, delta traps in groundnut, alleys in paddy, and cutting of the tips in paddy at the time of transplantation. Botanical extracts are applied as a last resort (SERP 2010).

Under CMSA, a group of 15 to 20 farmers are organized to form farmer field schools. The group meets once every week for field level observation, practice and training ingrained in the understanding of ecological systems. They learn the life cycle of pest as also predators and develop a pest calendar. Pest management as also the problem of nitrogen fixation or other soil nutrient deficiencies are addressed through locally available resources that involves minimal expenditure except for labour. Besides, efforts are put to encourage community seed banks, promote appropriate cropping and crop rotation, improve soil health through tank silt application, biomass plantation, encouraging local unemployed youth to start microenterprises for preparing inputs based on local resources, developing marketing networks among others (SERP 2010).

Institutional Imperative

It is being increasingly clear that to successfully replicate such experiments among the large mass of marginal and small requires among other things institutional arrangements. CMSA of SERP is showing the promise of replication: beginning with 400 acres in 2004–5, it covered 18.15 lakh acres of agricultural land in 2009–10, and aims to further increase its scale to 30 lakh acres in 2010–11 (SERP 2010). This has been possible because of the existing institutional structure – federation of self-help groups (SHGs) and the facilitating structure of SERP.

Personal interaction during field visits suggest that to begin with, SHGs were formed with about 15 women members, all the SHGs in the villages were federated to a village organization (VO) and these were further federated to mandal smakhyas (at
the block level) and zilla smakhyas (at the district level). The organizational structure of the SERP had professionals based at the state, district, block and village level helping in the facilitation of empowerment. The professionals were given autonomy while working under the aegis of the government. As most of the poor households came from agricultural backgrounds, the demand from the SHGs and the federated structure led to interventions in the form of community managed sustainable agriculture. There are plans of forming farmer groups (field schools or farmers SHGs with a woman and a man as members from a household) at the village, mandal and zilla level that would work in tandem with the SHG federation structure.

Some of the lessons from this, as also other successful experiments like the Grameen Bank experience in Bangladesh and the Peoples Participation Programme of the Food and Agriculture Organization (FAO) particularly through the involvement of agriculture extension services in Sri Lanka, Thailand and Zambia among others, are the following. The number of members in each group should be small (10-15 in SHGs or 20-25 in the farmer groups). Members should be from homogenous backgrounds with common interests and similar resource base so as to reduce internal conflicts and enable them function better compared to groups with heterogeneous membership. Groups should focus on solving common problems faced in the local conditions, instead of those identified by outsiders. The outside promoters like non-governmental organizations should take low-key presence and should enable the members of the group to take over soon. Developing sustainable small-marginal farmer groups that are also federated is a long-term process; there is need for a minimum of four to five years of training and capacity building. The use of specially-trained resident farmer group organizers is fundamental to sustainable organizational structure. Formation of groups at the village level is only a first step. Building a sound organizational structure by federating groups from the village level upwards to block and district level is fundamental to successful functioning of small-marginal and tenant farmers. Once the institutional structure is firmed up and capacity augmented these organization become self-sustaining and may diversify into other functions serving the small-marginal farming community (Reddy 2009, Rouse 1996).

5. Concluding Remarks

The persistence of distress in Indian agriculture has twin dimensions that are intertwined – the agricultural and the agrarian. On the one hand, there is an agricultural developmental crises arising out of poor designing of programmes and inadequate allocation of resources. This has adversely affected the production and productivity. Withdrawal of the state manifested in insufficient public investments, poor availability of credit, and the failure of research and extension to address the needs of dry land/rain-fed agriculture increased the risk and vulnerability in farming. On the other hand, there is an agrarian crisis threatening the mass of small-marginal farmers and agricultural labourers. The ratio of share of employment in agriculture to share of agricultural GDP is increasing. Incidence of calorie poor is higher than expenditure poor among cultivators and agricultural labourers and the average calorie and protein consumption among farmers and agricultural labourers has been decreasing – the irony is that the hands that produce food do not get adequate amounts to consume. A symptom of the larger crisis is the increasing incidence of farmers’ suicides. To revive farming as also the farmer, it is necessary to have alternative technology and institutional structure. There is a need to do away with input-intensive cultivation in favour of cost-reducing knowledge centric technology that builds on local resources and further strengthens the existing social capital. The latter is
possible through structures that empower the farmers at the grassroots, and organize them into federations so that they can aggregate different things at different levels. In short, the need of the hour is innovation in institutions (like federation of self-help groups), government structure that facilitates empowerment (not the current line departments which have become burdened under their own weight) and technologies that reduce costs/risks (not the input-intensive production practices) if we have to revive farming and save farmers.

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