# Sustainability of Indian Agriculture
## Towards an Assessment

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*This paper presents a systemic framework to look at the prospects for sustainability of Indian agriculture. The framework is based on trends, indicators and assessment by experts spanning three domains which are the principal influences shaping the growth, efficiency and stability of agriculture. The domains are: Natural Resources covering land, water, climate and environment; human Development comprising the charactetristics of farmers as producers and entrepreneurs; and, technology and institutions which provide the development thrust and means for harmonising growth, social justice and adjusdtment to globalisation. The paper concludes with three scenarios ranging from scary to desirable. Not surprisingly, the prospects for agriculture are seen to depend in the final analysis not so much on nature or factors beyond control as on friendliness of the policy regime towards farmer, agriculture and rural communities.*

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## I
## Introduction

The current agricultural stagnation has generated veritable panic at the highest policy making level in India. The 53rd Meeting of the National Development Council held in May 2007 was called specifically to discuss the agricultural strategy for the 11th Five Year Plan beginning this year. This paper brings together a number of indicators, and assessments by experts to bring out the genesis of the crisis and to present three alternative on the future prospects of Indian agriculture in terms of growth, development and sustainability.

*What does sustainability of agriculture imply?*
We propose the following criteria which in our view are reasonable and should be accepatable to most:

> *Agricultural growth at 4 per cent or more over the next several decades without causing damage to environment and natural resources;
> * increase in land and labour productivity in agriculture;
> * maintenance of balances of enterprises within agriculture and with other sectors in response to changing supply and demand conditions; and
> * international competitiveness in high value agriculture( HVC) and self-reliance in critical crops like foodgrains and raw materials.

Agriculture is usally viewed as a sector in the economy and related issues are analysed from that relatively narrow sectoral perspective. The criteria proposed above imply that we need to assesss long-term agricultural prospects in a broad perspective covering the Indian economy, polity and society, and even the emerging forces of globalisation.

*What are the conditions needed for sustainable development?*

* Conservation of environment and prevention of adverse climatic changes;
* strong basic and applied research systems for agricultural and related technologies;
* modernisation and upgradation of infrastructures;
* moderating rural-urban disparities and evolving a seamless rural-urban continuum to link rural communities with the main stream society;
* vertical integration of farming with corporates undertaking agro-processing, value addition, retailing and exports; and
* skillful trade agreements and arrangements for globalisation.

*If agriculture becomes unsustainable, what will be the very likely long-term repercussions*:
* Increase in the scale and intensity of poverty;
* drop in overall economic growth with the resultant stagnation in incomes and welfare in the society;
* disruptions in political and social stability; and
* decline in India's international standing and status.

The broader perspective needed to investigate issues relating to sustainability are not easy to construct and operationalise. Here we prepare the ground by assembling a number of clues from the available literature, drawing liberally from literature on the internet. The plan of the paper is as follows. Section II presents a brief summary of the selected recent trends to set the stage for investigating the theme of sustainability of agriculture. Section III pieces together a number of assessments by experts throwing interesting light on the prospects for sustainable agriculture. The prospects are far from cheerful. In section IV, we outline three scenarios that would be of some help in moving towards a systematic assessment of these prospects.

## II
## Major RecentTrends

**Growth Scenario**

There have been three phases in agricultural growth since Independence. During the 1950s to late 1960s the growth was area-based; the period between the late 1960s and early 1990s witnessed yield-based growth and the beginning of the shift towards HVCs. While agricultural growth did pick up after Independence, the decadal growth rates never reached the 4 per cent per annum that is the policy maker's target for the agricultural strategy for the 11$^{th}$ Five Year Plan. In fact, there has been stagnation in growth since the early 1990s. A recent study of agricultural crisis in India observes:

> The growth rate of agriculture has recorded notable deceleration during the post reform period 1990-91 to 2003-04 compared with the period 1980-81 to 1990-91. The slowing down and stagnation of agricultural growth has adversely impacted the income and employment of vast majority of rural people dependent on agriculture. Though, almost all the regions in India have experienced a deceleration in their agricultural growth, the adverse impact is specially serious in the dryland regions and on the small and marginal farmers with limited resources. One more factor that has exacerbated the situation is that just at a time when small, marginal farmers and medium farmers were showing signs of enterprise by investing in better productivity agriculture, there has been deterioration in support systems"( An unpublished study of agricultural crisis in India, Expert Group on Farmer Indebtedness, Government of India, 2007).

The comfortable food grain situation since the early 1970s has also deteriorated in the last few years; wheat imports have reappeared after three decades of ample procurements and stocks.

It is instructive to look at the growth scenario in some detail drawing on the statistical tables provided in the study noted above. Table 1 shows that the agricultural growth rate was only 2.5 per cent over the period 1950-51 to 2003-4. There was a decline in the growth rate between 1981-2 - 1990-1 and 1992-3 - 2003-4. The overall GDP growth rate was pulled down by the low agricultural growth rate compared to the rates in industry and services. Table 2 indicates that the growth rates of yield of major crops declined sharply between 1990-91 and 2003-04 as compared to growth in yield in the period 1980-81 to 1990-91. The growth rates of yield were less than 2 per cent in the case of all major crops in the later period.. More important, the growth rate of food grains fell from 2.85 per cent in the 1980s to 1.16 percent in the 1990s, which was lower than the rate of growth of population of 1.9 per cent during this period.

**Table 1: Growth of GDP, Per Capita Income and Sectoral Income**

(1993-94 prices)

| Years | GDP | Agr. | Secondary | Tertiary | Per capita Income |
|---|---|---|---|---|---|
| 1981-82 to 1990-91 | 5.62 | 3.08 | 7.10 | 6.72 | 3.50 |
| 1992-93 to 2003-04 | 6.10 | 2.38 | 6.29 | 8.22 | 4.21 |
| 1950-51 to 2003-4 | 4.33 | 2.54 | 5.54 | 5.54 | 2.12 |
| | | | | | |

**Table 2 : Growth of Area, Production and Yield of Major Crops in India, 1980-81 to 2000-01**

| | 1980-81 to 1990-91 | | | 1990-91 to 2003-04 | | |
|---|---|---|---|---|---|---|
| Crop | Are | Pro | Yield | Are | Pro | Yield |
| Rice | 0.40 | 3.56 | 3.47 | 0.15 | 1.14 | 0.99 |
| Wheat | 0.46 | 3.57 | 3.10 | 0.74 | 2.13 | 1.35 |
| Coarse Ce | -1.34 | 0.40 | 1.62 | -1.58 | 0.25 | 1.87 |
| T..Cereals | -0.26 | 3.03 | 2.90 | -0.25 | 1.32 | 1.58 |
| T. Pulses | -0.09 | 1.52 | 1.61 | -0.87 | -0.74 | 0.16 |
| Foodgrain | -0.23 | 2.85 | 2.74 | -0.44 | 1.16 | 1.11 |
| Sugarcane | 1.44 | 2.70 | 1.24 | 1.41 | 1.22 | -0.16 |
| Oilseeds | 1.51 | 5.20 | 2.43 | -1.07 | 0.18 | 1.26 |
| Cotton | -1.25 | 2.80 | 4.10 | 0.82 | 0.15 | -0.69 |
| NonFoodg | 1.12 | 3.77 | 2.31 | -0.09 | 1.20 | 0.62 |
| All Crops | 0.10 | 3.19 | 2.56 | -0.25 | 1.58 | 0.90 |

Table 3 throws up evidence of the uneven development of agriculture across the states. During the period 1993-94 to 2003-04 there was a decline in agricultural growth as well as an increase in disparities across the states. GDP trends were exactly opposite---there was an increase in the growth rate with a modest decline in the inter-state disparities.

**Table 3: State-wise Growth of Agriculture and 1993-94 to 2003-04, GDP (CAGR)**

:

| State | 1983-84 to 1993-94 | | 1993-94 to 2003-04 | |
|---|---|---|---|---|
| | At 1980-81 Prices | | At 1993-94 Prices | |
| | Agricult | GDP | Agricult | GDP |
| AP | 3.05 | 4.58 | 2.80 | 5.63 |
| Assam | 2.12 | 3.51 | 0.51 | 2.93 |
| Bihar | -0.45 | 2.69 | 2.50 | 5.34 |
| Gujrat | 0.84 | 5 | 1.13 | 6.19 |
| Haryana | 4.86 | 6.18 | 1.77 | 5.96 |
| HP | 3.08 | 5.89 | 1.30 | 6.53 |
| KAR | 3.54 | 5.86 | 3.12 | 7.10 |
| Kerala | 4.4 | 5.33 | -2.00 | 4.85 |
| MP | 2.82 | 5.21 | 0.23 | 4.14 |
| MAHA | 5.39 | 7.42 | 1.27 | 4.92 |
| Orissa | -0.57 | 3.39 | 0.17 | 3.96 |
| Punjab | 4.62 | 5.13 | 2.15 | 4.13 |
| Rajastha | 3.93 | 6.19 | 1.21 | 5.32 |
| T. Nadu | 4.43 | 7.45 | -0.60 | 5.08 |
| UP | 2.8 | 4.66 | 2.18 | 3.76 |
| W.B | 4.45 | 4.73 | 3.45 | 7.03 |
| India | 3.05 | 5.32 | 2.19 | 6.01 |
| C V | 58.72 | 25.43 | 102.88 | 22.75 |

CV: Coefficient of Variation, a measure of disparities in the growth rates across the states.
*Note*: Tables 1 to 3 are from the study prepared for the Expert Group on Farmer Indebtedness referred to above.

An intriguing feature of the growth scenario is that while stagnation has set in Indian agriculture agricultural scientists point out that there are large areas with potential still to be fully developed in eastern, central, southern and western India.. There are also marked inter-district variations in agricultural growth. Only about 20 per cent of about 500 districts contribute substantially to growth. An equal number have had stagnant yields for many decades [Bhalla and Singh, 2001]. The transition towards high value crops (HVC) has brought in corporates in agriculture in a big way with farmers co-opted as junior partners in arrangements for vertical integration of farming with processing, marketing and retailing. A related trend is the continuous marginalisation of holdings. Small and marginal holdings account now for nearly 90 per cent of all holdings. Thus, the institutional matrix of Indian agriculture is moving towards an unequal partnership between a powerful combination of corporates and large owners on one hand and a weak and unorganised mass of marginalised owners on the other.

## Rural Communities

Localised nature of rural communities and their isolation and self-sufficiency have been eroded. They have now multiple links with urban areas whose boundaries are spreading out with urban life styles powerfully impacting rural life styles. Three strata are emerging in rural communities: An affluent elite at the top with strong outward orientation and considerable economic and

political clout; an intermediate strata of dynamic farmers with roots in agriculture; and, a footloose rural poor section, either landless or with one foot out of agriculture.
The village identity has undergone a change. Nobody likes to stay in villages; even the poor prefer urban slums! Some improvement has occurred in infrastructure and services but, over all, villages present a depressing picture. For rural development strategy, villages need to be considered open systems. While it is important to make optimum use of local resources, it would be misleading to believe that this by itself would be enough for the development of the rural communities.

**Urbanisation**

The transition in rural communities noted above needs to be viewed as part of the broader process of urbanisation in which, spatially, urban boundaries expand and rural boundaries shrink. Some villages grow in size, and eventually acquire urban features. The average distance of a village from an urban place decreases. An increasing number of rural people work in nearby urban places and gradually become urbanites. The point is that urbanisation does not simply mean migration of rural people into cities and towns. It means the spatial spread of urban places, rural places acquiring urban features, and the spread of urbanite-likes in rural areas. The percentage of people living in urban areas is an inadequate indicator of urbanisation as a growing number of rural people will begin to look, think and behave like urbanites. Our images of rural people as passive sufferers living in isolation with agriculture as a way of life need to change. It may no more be as easy to the policy maker in future as in the past to neglect agriculture and to remain indifferent to the woes of rural people.

**International Context**

Finally, a trend which is gaining critical importance as a factor influencing the prospects for agricultural growth in the developing countries like India is the barrier placed by the developed countries on the agricultural exports of the developing countries and increasing pressures on them to provide market access to agricultural exports of developed countries. The international context is becoming adverse for the developing countries as their development gap with developed countries is widening by year making them increasingly vulnerable to pressure tactics of the developed countries. Even at the cost of some diversion, we give below a finding thatshould come as a rude shock to many in India.
A recent study of income inequality in the world by Branko Milanovic (2002) of the World Bank (*Economic Journal*, January 2002) brings alarming tidings. We give below the main findings of the study from a summary that appeared on the BBC news website on January 17, 2002.

> Global inequality is rising fast -- increasing by around 5 per cent in the five years between 1988 and 1993... The gap is so big that the richest one percent of people (50 million households), who have an average income of $24,000 earn more than 60 percent of households (2.7 billion people) at the bottom of the income distribution…..During this period, the average yearly income (US$ real PPP) of the top one percent of the population increased by 20 percent and that of the top 10 percent by about 15 percent. The average yearly income decreased for the middle 50 percent, bottom 10 percent and bottom 5 per cent of the population…..The biggest source of inequality is the difference between the income of people in the five major economies (USA, Japan, Germany, France and Britain) and the poor in rural India, China and Africa.

**Looking Ahead**

Many of the trends noted above are difficult to track and it is even more difficult to predict their future course. What is possible may only be informed guesstimates about their total impact on agriculture with numerous 'ifs' and 'buts'. It is worth recalling here that nobody could predict the green revolution in India and the spectacular success it achieved in less than a decade. Not many may remember the two American authors who, a couple of years prior to the green revolution predicted widespread famines, hunger and deaths in India! They warned the US government against giving aid to a sinking country. A similar fate may await those who now predict either a shining agriculture in India over the coming decades or proclaim a doomsday. We have selected three domains which are critical as determinants of sustainability of agriculture:

i) *Natural Resources Domain:*

Land, water, climate and environment provide the physical foundation of agriculture. Serious damage to them through neglect or improper use can by itself push agriculture into an irreversible crisis. On the other hand, their conservation and optimum use can help agriculture to reach its full potential..

ii) *Human Development Domain*:

The farmer is the creator and operator of agriculture. The experience of the green revolution provides convincing evidence about the farmers' ability to transform agriculture in only a few years if the policy regime is right and other preconditions ensured. But, if the farmers are spurned as traditional and ignorant producers not looking beyond subsistence, they could rebel with graver consequences than those witnessed so far. When the farming sector begins to demand its due, the policy maker will be forced to rethink the present strategies based on exploiting the farmer

iii) *Technology-cum- Institutions Domain*:

This is the domain providing innovations and new institutional structures to help agriculture and the farmer to benefit from globalisation rather than become its victim. Achievements in this domain are grounded on the readiness to experiment and take risks. They also require vigilance and flexibility in dealing with the unexpected and the uncertain which are routine in a globalising agriculture.

## III
## Selected Indicators and Assessments by Experts

**Natural Resources Domain**

*Land and Water*:

These are critical inputs for sustainability of agriculture. As regards land, the scope no more exists for extending cultivation to new areas. In fact, the marginal land now being cultivated needs to be shifted to forests or pastures.Hence, growth has to come from increase in yields. While the potential for increase in yields exists, the productivity of land remains low and stgnant in all the three major regions in India. In the Eastern part, floods impose heavy losses every year; in the Southern amd Western parts, droughts are an annual phenomenon in one area or another; even in green revolution areas in the north, rice-wheat rotation has led to damage to land and yields. Watershed development is crucial in drought-prone areas but practically no progress has been made in this direction. Without this foundation, broadbased delepoment in drought-prone agriculture would not be possible. More generally, soil conservation still remains on the

drawingt board without reaching the field. The increasing burden of population depending on agriculture has led to encroachment of cultivation into forests, pasturtes, tank beds and other lands not suitable for cultivation.

Regarding water which is more critical for agricultural growth than even land , consider the following depressing picture that, six decades after Independence, only a little over 50 per cent of the irrigation potential has been used. It needs to be noted that in a desperately water-starved agriculture, even the potential created so far has not been fully used! The alarm bell warning about the years ahead is that by 2020 the water requirements will almost catch up with the total usable water resources in India i.e. as early as a little over a decade from today!

**Table 4: Water Resources in India**

| | |
|---|---|
| Total Usable Water Resources in India | 1086 cubic kilometers |
| Present Use | 600 ckm |
| Estimate of Water Requirement by 2020 | around 1000 ckm |
| Ultimate Irrigation Potential | 140 million hectares |
| Potential Created | 89 mha |
| Utilised so far | 79 mha |
| Actually Irrigated( statistics of Ministry of Agriculture) | 71 mha |

Source: *Sustaiable Water Use in India*, K V Raju, Institute for Social and Economic Change, Bangalore, 2005 ( Unpublisdhed study).

An interesting point about India's land and water resources is that the collection,maintenance and updating of data on them is shockingly inadquate and poor in quality and reliability. A central minister recently described the land records in India as "garbage". He was hardly exaggerating the defects in the land records. It is common knowledge that most of the tenancies are concealed, encroachments remain unrecorded and data on land transactions are thoroughly unreliable. The recording of ownership and cultivation of land is ususally so infrequently updated that it is not unusual to find a person long dead still appears in the records as an owner while defacto it is his grandson who now owns the land. Regarding water resources, there are intra-government disputes about the estimates of ultimate irrigation potential and potential created and used. We are highlighting these defects in data to point out that India's policies on vital aspects like land reforms and conservation and efficient use of land and water resources are based on shockingly poor data bases and this in a country renowned for its statitical expertise! The reason is simple, the policy maker remains much too preoccupied with the shining sectors in the economy to bother about villages, agriculture and rural poverty. In 2006, six decades after Independence, the Government of India launched an ambitious rural employment guarantee programme with a lot of fanfare. It is difficult to think of a more revealing indication that this critical programme which began several decades back with different labels was yet to take off !

## Climate

The World Bank sketches an alarming scenario:

As fears of global warming become more pronounced, India needs to take a serious view of the environmental havoc that stares in its face. Stocks of greenhouse gases in the atmosphere will double by 2040 and more than treble by the end of the century. This will bring in its wake soaring temperatures, more intense rainfalls, increased cyclonic activity, severe droughts and floods, erratic weather patterns, melting of glaciers and rising sea levels.

> The impact of these will be far-reaching in India. Experts have already warned that global warming will reduce crop yields, spread diseases and cause loss of biodiversity. These changes will also pose economic risks to water supplies, food production, electricity, human health, road and rail infrastructure and coastal livelihood.
> Source: *Deccan Herald,* June 13, 2007, Climate Change by Tirtho Banerjee

**Environment**

It is worth taking serious note of the following assessment by Partha Dasgupta of Cambridge University in England:

> The Indian sub-continent and sub-Sahara Africa – two of the poorest regions of the world which make up around a third of the world's population—have really become poorer over the past decades… If the decline of natural capital is included under a new measure –which the report dubs wealth per head—traditional insights into poverty reduction are turned upside down, It reveals that sub-Sahara Africa, Bangladesh, Nepal and India are all heading into deeper gloom and poverty. ('World sinks into deeper poverty' BBC website, June 8, 2001).

The constraints, with their roots in the natural resource domain, are formidable as they need coordinated collective action from the community level upwards. An individual farmer by cannot remove them his own actions alone. The action on climate and environment has to be at both national and international levels where unfortunately,consensus remains elusive and there are frequent disputes and delays. When these constraints operate along with weaknesses in the other domains, the threat of an agrarian crisis becomes all the more ominous.

**Human Development Domain**

In the agricultural scenario, the farmers play a central role. Table 5 clearly shows that they are moving on the path to economic ruin. The average size of holding is now 1 hectare indicating the marginalisation of holdings. Over a period of just four decades, the average size of holding has decreased from 2.6 hectares to 1.06 hectares. Massive numbers of farmers are likely to be pushed out of agriculture as the average size will have a floor below which the farmer cannot survive. Table 6 indicates that the production structure now rests on the weak shoulders of marginal, small amd semi-medium holdings ( all below 4 hectares) who now account for two-thirds of total cultivated land. Four decades back nearly 60 per cent of cultivated land was with the medium and large holders. The widening gap in productivity between agriculture and non-agriculture stands out in Table 7. Although agriculture now accounts for only one- fifth of the GDP, 57 per cent of total workers are still trapped in agriculture.

A recent all-India study by the National Sample Survey ($59^{th}$ round on the Situation Assessment Survey) indicated that over 60 per cent of farmers desired to leave agriculture if an alternative was available because the very low and uncertain returns in agriculture was forcing them to turn to casual wage labour for survival. Many of them find the urban slums a lesser evil than a continuing struggle in agriculture. A recent trend is suicide by a large number of upwardly mobile farmers indicating that the more enterprising among them are getting frustrated in their attempts to move up. Would it not be reasonable to assume that one suicide may persuade scores to curb their ambition to move up! It is easy to imagine the disastrous consequences of this fallout for the spread and pace of agricultural modernisation.

**Table 5: Certain Key Characteristics of Operational Holdings**

| | 60-61 | 70-71 | 81-82 | 91-92 | 2003 |
|---|---|---|---|---|---|
| | (17th) | (26th) | (37th) | (48th) | (59th) |
| 1.Number of operational holdings (mill.) | 50.77 | 57.07 | 71.04 | 93.45 | 101.27 |
| 1.1 percentage increase | - | 12.4 | 24.5 | 31.5 | 8.4 |
| 2. Area operated (mha.) | 133.48 | 125.68 | 118.57 | 125.1 | 107.65 |
| 3. Average area operated (ha.) | 2.63 | 2.2 | 1.67 | 1.34 | 1.06 |

Source: NSSO; Land Holding Surveys 1960-61 to 2003.

**Table 6: Changes in the Size Distribution of Operational Holdings and Operated Area 1960-61–2002-03**

**(**percentages)

| ALL-INDIA | RURAL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category of Holdings | Percentage of Operational Holdings | | | | | Percentage of Operated Area | | | | |
| | 1960-61 (17th) | 1970-71 (26th) | 1981-82 (37th) | 1991-92 (48th) | 2002-03 (59th) | 1960-61 (17th) | 1970-71 (26th) | 1981-82 (37th) | 1991-92 (48th) | 2002-03 (59th) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| Marginal | 39.1 | 45.8 | 56.0 | 62.8 | 71.0 | 6.9 | 9.2 | 11.5 | 15.6 | 22.6 |
| Small | 22.6 | 22.4 | 19.3 | 17.8 | 16.6 | 12.3 | 14.8 | 16.6 | 18.7 | 20.9 |
| Semi-Medium | 19.8 | 17.7 | 14.2 | 12.0 | 9.2 | 20.7 | 22.6 | 23.6 | 24.1 | 22.5 |
| Medium | 14.0 | 11.1 | 8.6 | 6.1 | 4.3 | 31.2 | 30.5 | 30.1 | 26.4 | 22.2 |
| Large | 4.5 | 3.1 | 1.9 | 1.3 | 0.8 | 29.0 | 23.0 | 18.2 | 15.2 | 11.8 |
| All Sizes | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Source*: 1. *Source of Estimates of 17th, 26th, 37th and 48th rounds: NSS Report No. 407.*
*2. GOI-NSSO 2006, p. 18.*

**Table 7 :Share of Agriculture in GDP and Employment**

| Year | per centShare of Agriculture in GDP at 1993/94 Prices | per cent Share of Agriculture in Employment (UPSS) | Ratio of Worker Prod. in Agr. to Non-Agr. | Ratio of Worker Prod. in Non-agr. to Agr. |
|---|---|---|---|---|
| 1972-73 | 44.8 | 73.9 | 0.287 | 3.49 |
| 1993-94 | 33.5 | 63.9 | 0.285 | 3.51 |
| 1999-00 | 27.6 | 60.2 | 0.252 | 3.97 |
| 2004-05 | 20.8 | 56.5 | 0.199 | 4.94 |

*Source: National Accounts Statistics and NSSO Survey on Employment and Unemployment* – Various rounds.
*Note:* Tables 5,6 and 7 are taken from an unpublished study prepared for the Expert Group on Farmer Indebtedness, Government of India, 2007

A worrisome weakness of farmers is that even in the state of Haryana, which is in forefront in adopting green revolution, the farmer remains a primary producer rather than an entrepreuner sensitive to opportunities to make gains in marketing and value addition.
A recent study describes agriculture in Haryana as " prosperous with suitable climate and sufficient irrigation ( and) moving towards maturity with diversification towards high value cash crops". The findings of the study on the farmers' marketing performance are far from encouraging:

> The farmers hardly bothered about the price prevailing in other markets… among the households surveyed there was a complete lack of market intelligence (and) lack of consciousness about the prevailing prices in different markets….There was a possibility of the farmers getting a higher net price either by delaying their sale after harvest or by selling more carefully in a mandi which could fetch them a higher net price, even if this was located at a far off distant place"( Kumar, 2007].

If this is the situation in Haryana, it must indeed be much worse in the agricultural backwaters with stagnating yields and widespread poverty.

When farmers remain poor and weak in human development, other sections depending on agriculture—labourers, artisans, village traders—catch the infection making the rural scenario one of pervasive misery. Linkages with large markets and mainstream economy do not develop the thrust to integrate agriculture with the rapidly growing industries and services sectors.

we conclude the discussion on the human development domain with two overall indicators of poor human development in India. First, consider Table 8 givivg a comparative picture of human development index of UNDP (HDI) in India and selected developing countries.

**Table 8: HDI Ranks of India and Selected Developing Countries**

| High Human Development (HDI values between 0.801 and 0.960) | Medium Human Development (HDI values between 0.500 and 0.794) | Low Human Development (HDI values between 0.176 and 0.475) |
|---|---|---|
| Mexico (0.853;50) | Brazil (0.783;68) | Myanmar (0.475; 131) |
| Colombia (0.848;51) | Jamaica (0.736;83) | Kenya (0.463;134) |
| Thailand (0.833;59) | Cuba (0.723;86) | INDIA (0.446;138) |
| Malaysia (0.832;60) | Sri Lanka (0.711;91) | Nigeria (0.393;141) |
| Mauritius (0.831;61) | Indonesia (0.668;99) | Tanzania (0.357;149) |

*Source*: *Human Development Report 1997*, UNDP, Oxford University Press, New York, 1997 (See Table on Human Development Index, pages 146-148).

In Table 8, two numbers in parentheses for each country are the HDI value and the rank of the country. The High Human Development group includes Mexico and Colombia from Latin America; Thailand and Malaysia from South East Asia and Mauritius in the Indian Ocean. They get ranks ranging from 50 to 61. The Medium Human Development group has Brazil, Jamaica, Cuba, Sri Lanka and Indonesia getting ranks from 68 to 99. India sits in the third group and ranks lower than even Myanmar and Kenya. Interestingly, Myanmar figures among the least developed countries in the world! It is instructive to see that countries hardly comparable to India in size, industrial base, pool of scientific talent and international status have done much better than India on the HDI scale. It also needs to be mentioned that HDI for rural India is likely to be much lower than the low Indian HDI given in table 8.

For the second indicator of human development, we draw on the ranking of 50 countries (including India) for the year 2007 by an index called Prosperity Index developed by The Legatum Institute for Global Development (LIGD) which is an independent policy, advocacy and advisory organisation headquartered in London. The comments below are drawn from a report appearing in the website of *Business Standard* of July 3, 2007:

> The first annual edition of the Legatum Prosperity Index, which covered 50 countries, is the result of an investigation into the factors that drive prosperity in different countries. Recent research advances have made it possible to compare not only material wealth, but also life satisfaction of people. Accordingly, Legatum has defined national prosperity as the well-rounded combination of both these factors….. Nine per cent plus economic growth, rising stock prices and people becoming richer: Indians should be getting happier and feeling better about life, right? On the contrary, India, along with Pakistan and Egypt, figures near the bottom of a table of nations in a survey that ranks them in terms of prosperity. The three countries are better than only Zimbabwe…India's low position may seem puzzling, given the country's achievement of democracy and Indians' oft-noted spiritual strength….. But these strengths, it seems, cannot make up for an extreme deficiency in health. Health is the second-strongest determinant of life satisfaction, trailing only freedom of choice, and India has one of the three lowest scores in our study.

The blame for this weakness needs to be placed squarely on the policy maker who gives higher priority to super-speciality hospitals neglecting rural health centres.

**Technology-cum-Institutional Domain**

There are some positive clues from the technology-cum-institutions domain though they do not add up at the moment to a firm optimistic scenario. First, large areas in India which are annually devasted by droughts and floods have technologies and investments waiting to be applied but have been neglected so far. These annual tragedies are man-made in the sense that the policy maker has not so far moved beyond token programmes and wasteful expenditure. There is a large growth and development potential here which could transform the agricultural scene. As agriculture gets closer to the brink, the policy maker may become more alert and pro-active. The Approach to 11$^{th}$ Five Year Plan accords high priority to development of rain-fed agriculture which means agriculture without assured/protective irrigation.

There are two indications of activation of bottomup forces. Self Help Groups (SHG) of rural women have a creditable record evidencing the scope and feasibility of the poorest and the weakest strata in the society getting organised for taking the initial steps towards empowerment. More recently, in Andhra Pradesh, farmer SHGs have undertaken several programmes to improve cultivation, marketing and related activities. Usergroups for a variety of activities are being set up on a large scale though they are yet to become a stable and fully operational part of the grassroots level institutional structures. If these stirrings are linked up with Panchayati Raj Institutions ( PRI) setup, they may help in achieving the goals of participatory and people-oriented decentralisation which is still the unrealised goal of PRI experiment of having a third tier of government. The lack of progress in this direction is due to the reluctance of the state governments to pass down the resources and decision-making powers to PRIs as visualised in the constitutional amendments of 1993 and inaction on the part of the central government to persuade/pressurise the states.

Secondly, Public Interest Litigations ( PLI) and well-organised agitations like Narmada Bachav Andolan have become a strong enough force to protect the interests and livelihoods of victims of large projects. There is scope to make them more effective so that the policy maker cannot pursue the growth objective without a care about its negative effects on the poor and the marginalised.

Agro-processing and value addition is expected to usher in a major revolution in agricultural growth and modernisation through new technologies and products with global markets. An influential group of experts believe that vertical integration of farming with value addition and

retailing chains through arrangements like contract farming will bring about a transformation in Indian agriculturer:

> In countries like India where the existing infrastructure for agro-processing is increasing, multiplier effects of institutional and infrastructure development in terms of income and employment generation in the primary, secondary and tertiary sectors are enormou [Joshi, Gulati, Cummings Jr., 2007: 433].

However, it is important to remember that the institutions currently serving agriculture function poorly and are of little help to the farmer.

i) For example, markets are characterised by

> …monopoly of local Mandis (wholesale markets) which are controlled by trader cartels. Price fixing, underweighing and delayed payments, farmers are cheated by these traders at each stage. In Uttar Pradesh, farmers reportedly lose between 10 and 30 per cent of their sale income to malpractices rampant in mandis [Joshi et al 2007: Chapter 18 ].

It is quite likely that all these markets are covered by laws for regulation of markets and illustrate the very limited reach and power of laws in helping the farmers.

ii) Regarding extension,

> Extension reform has yet to become widespread in India…Many of the organisations that are already involved have too narrow a view of extension….( the broader vision) faces severe and long-standing implementation problems. Given the complexity and intractability of these, a wide-scale transformation of what is still predominantly publicly funded and publicly implemented extension in India is likely to take at least a decade [Chistoplas and Farrington 2004: 77 and 83. This quote is from the review of the book published in Indian Journal of Agricultural Economics, Vol 61, No.1, January- March, 2006].

The "broader vision" advocated in the book argues that agricultural extension should focus on the poverty and vulnerability of the farmer facing the challenges of globalisation and not merely on raising agricultural productivity.

It is equally important to remember that India is entering the era of globalisation with weak bargaining power vis-a-vis the developed countries and declining international competitiveness. Consider the following two assesments:

> The fears of developing countries on SPS ( sanitary and phyto-sanitary norms) becoming increasingly important and developing into significant barriers to trade have come true". The difficulties identified by the developing countries are " high cost of adaptation, irrelevance of foreign standards to local conditions, perceived lack of scientific data for the specific threshold, uncertainty that arises from the rapidly changing stringent requirements in the overseas markets….The new residue limits being introduced by the developed countries should be monitored carefully along with new issues being added every time India fulfills the old obligations [In a delightful sarcastic stroke, the chapter calls SPS the " Shifting (goal) Post Syndrome!]… HACCP creates virtually insurmountable costs for the small and medium scale sector [Joshi et.a al. 2007: Chapter 15 ].

According to the IMD *World Competitiveness Year Book*, 2005, India has dropped to 39$^{th}$ rank from 34$^{th}$ rank in the last year.

> India continues to be dogged by problems on several fronts—large poverty base, low levels of productivity, escalating infrastructure bottlenecks, high levels of unemployment and under-employment and poor public finance management. …India needs to prioritise improvements in key areas like energy infrastructure and water transportation to help boost the competitiveness rank….Subsidies, corruption and pollution seriously affect the economy…the real engines of competitiveness are: science, technology, entrepreneurship, finance, logistics and education , areas in which India has a long way to go". (see Deccan Herald, Bangalore, May 12, 2005:13).

A weakness common to all the three domains scanned above is the inappropriate and ineffective policies. It is as if the policy regime is deliberately hostile to agriculture caring little about the grave consequences for the entire country of a sustainability crisis in agriculture.
We outline three alternative scenarios based on the variations in the policy regime from hostile to agriculture-cum-farmer friendly.

## VI
## Looking Ahead Speculatively

Assessed in the light of the trends described in section II, the indicators and expert assessments presented above can hardly bring much cheer to the policy maker. In fact, agriculture seems to induce a mood of palpable weariness in him. The Prime Minister sounded helpless and alarmed in the 53rd meeting of the National Development Council held on May 29, 2007.
He observed :

> … small and marginal farming has become an unviable proposition…until farming was made viable at this scale, it would be virtually impossible to reduce rural povertry and distress…subsidies have been increasing and investments declining…(there has been) lack of any breakthrough in agricultural production in recent years . There is a technology fatigue. (Opening Address of The Prime Minister to 53rd Meeting of the National Development Council held on May 29, 2007 to discuss the agricultural strategy for the Eleventh Five Year Plan.
> Source: http://gov.in/ndc )

Any weariness of the policy maker in reforming and restructuring agriculture will be ruinous for India. The consequences will not remain confined to agriculture. A prolonged agricultural stagnation will shake the very foundations of the nation affecting all the three constituents—the economy, the polity and the society. Tograsp this, it is necessary to go beyond economic criteria underlying the conceptualisation of development in Economics.
The Fund for Peace, an organisation located in Washington D C , USA, has developed an index based on 12 indicators listed below to rank countries according to the degree to which they are "failed states"—the higher the rank the greater the degree of failure.

*Social Indicators*

I-1. Mounting Demographic Pressures
I-2. Massive Movement of Refugees or Internally Displaced Persons creating Complex Humanitarian Emergencies
I-3. Legacy of Vengeance-Seeking Group Grievance or Group Paranoia
I-4. Chronic and Sustained Human Flight

*Economic Indicators*

I-5. Uneven Economic Development along Group Lines
I-6. Sharp and/or Severe Economic Decline

*Political Indicators*

I-7. Criminalization and/or Delegitimization of the State
I-8. Progressive Deterioration of Public Services
I-9. Suspension or Arbitrary Application of the Rule of Law and Widespread Violation of Human Rights
I-10. Security Apparatus Operates as a "State Within a State"
I-11. Rise of Factionalized Elites
I-12. Intervention of Other States or External Political Actors

The ranking of 177 countries in the current year places 15 developed countries in the category "sustainable", 33 in the category "moderate" degree of failure, 97 in the category "serious" and 32 in the category "critical". India is in the 110the place, that is, in the "serious" category. All the countries adjoining India—Pakistan, Bangladesh, Srilanka, Nepal and Mynamar( Burma)—have "critical" degree of failure of state. According to the study " India is now considered more stable than China and Russia. In 2005, India was ranked below China, at 76. In 2007, both China and Russia are ranked at 62, while India's social, economic and military metrics have propelled it to 110". Prolonged agricultural stagnation will worsen many of the indicators listed above and push the country towards more severe degree of failure of state. The prime minister too has gone on record to admit that it would be impossible to eliminate rural poverty and distress unless agriculture is made sustainable at the level of small and marginal farms.
Currently, Indian agriculture is carrying an enormous burden of policies marked by neglect of backward areas and the poor, encouragement to wasteful use of water, power and other scarce inputs, dysfunctional subsidies and negligence towards infrastructures and investments. We outline three scenarios based on the policy maker's performance in reforming and restructuring agriculture. We have also indicated probability of each scenario reflecting our own assessment about the future. The assessment is purely subjective and is given only to stimulate discussion. We are not sure that there is an adequate appreciation even among academics and intellectuals about what an agricultural crisis can do to India.

***Scary Scenario: SS ( probability 15 per cent)***

SS would become operative if the present policy regime persists and the agricultural stagnation and crisis deepen resulting in: Stagnation in rural economy—growth rate of economy declines—political agitations spread with increasing violence and disruptions—separatist movements and disaffected groups gain strength—rising crime graph--hurdles in globalisation—loss of status at world level—growing apprehensions about breakup/break down of the country—adverse expectations, flight of capital and talent from the country—India joins the group of countries with "critical" failure of state.

***Likely Scenario:LS ( probability 80 per cent)***

Rapid growth in corporate-led high-value agriculture and value addition—their expanding links with farmers in pockets large and small all over the country; these pockets could become growth centres transforming their hinterlands; other rural areas could also benefit from this enclave type of agricultural growth; overall growth remains high; increased trickle-down leads to some reduction in poverty but human development lags, unemployment increases and a large part of workforce remains in the unorganised sector with no security of any kind; water-saving technologies may help agriculture to cope with dwindling supplies of water; high value agriculture likely to be capital-intensive and land saving; demand for goods and services by the consumerist rural middle class may pull rural workers from agriculture. However, in this scenario there would be no assurance of long-term sustainability of agriculture. Eventually, the country may start drifting toweards "critical" failure of state.

***Desirable Scenario: DS ( probability 5 per cent)***

The government takes full care of social sectors, security for unorganised workers and safety nets for the hardcore poor—PRIs and the fuctional groups ( SHGs, User Groups etc.) of rural people manage the community resources, improve delivery systems, make development

personnel accountable and ensure effective participation of rural people in the planning and implementation of development programmes; corporate sector brings about fast growth of high-value agriculture raising overall growth directly and also through its long chain of backward and forward linkages; and government provides infrastructure, operates a vigilant regulatory regime and deals effectively with efforts of developed countries to impose their rules of game in trade and other relations.

It is only this scenario which ensures sustainable agricultural growth and development. The snag is that given the ungandhian elites and middle classes in India who dominate development strategies and policies, it is our honest assessment that this scenario has no more than 5 per cent chance of being realised! It is important to remember that over a decade and half after the 'revolutionary' Constitutional amendments in 1993, the third tier of governance is still eluding India. Legislation to give larger representation to women in the parliament and state assemblies has not even been enacted so far. The excuse is that there is no consensus among the political parties. Media and even academics usually stop with pointing fingers at politicians and bureaucrats for our agricultural woes and other economic problems.

The deeper source is the pursuit of consumerist interests and priorities by organised groups, accounting for about 15 per cent of population. Rise in onion prices in Delhi can destabilise the mighty central government, but the poor in backward areas like parts of Orissa for whom hunger is a day-to-day challenge continue to remain with neither visibility nor voice. India cannot hope to shine while keeping over 80 per cent of population in slum-like conditions of poverty and degradation.

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