Notes on Land, Long Run Food Security and the Agrarian Crisis in India

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Introduction: ***Perspectives on control over land, long run food security and the agrarian crisis in India***.

Less than three years ago, (April 2009), Joachim Von Braun and Ruth Meinzen-Dick wrote a marvellous Policy Brief for IFPRI titled *'Land Grabbing' by Foreign Investors in Developing Countries: Risks and Opportunities.* The Policy Brief highlighted the international land grab for food production. More recently, (in September 2011), the FAO put out a Background Paper titled *Towards a Global Soil Partnership for Food Security and Climate Change Mitigation and Adaptation*. It treated land as an input into food production and climate change mitigation.

The common themes were land and long run food security.

A third, Indian, perspective is provided by a few passages from an even more recent Indian Supreme Court judgment, (November 2011). (See Part I, below.)

What makes these documents so different? One of them – the FAO paper - leaves out the people directly involved in production. It thereby sidesteps the issue of control over land and land use.

In this context, a distinction between an *agricultural crisis* and an *agrarian crisis* approach to issues of land use and land alienation may be noted. The agricultural crisis approach of the FAO Background Paper treats land as an input into food production. The agrarian crisis approach of the IFPRI Policy Brief looks at land as a bone of contention in a power struggle; it is concerned about what is happening to the people who grow food in countries like India, where the political character of the struggle is sometimes brought out in the open, as in the case of the recent Indian Supreme Court judgment.

The distinction is important. In some of the recent international (and Indian) literature, the exclusive focus on the agricultural crisis, even in the name of food security, has tended to overshadow the political power issues at the heart of the agrarian crisis, one of which concerns the control over land use.

These Notes are about a pivotal element in both these crises – scarce land – and its links with India's demonstrated vulnerability to domestic and global food price increases and the silent ongoing crisis of low and declining growth rates in per agricultural worker productivity.

In India, population pressure on land has led to a situation where the vast majority of farmers do not earn enough from crop cultivation and animal husbandry combined to

cover actual consumption expenditures[1]. The size of the land they cultivate is too small. This is the situation at the grass roots.

At the national level, the failure to take serious steps to raise the productivity of what land there is during the last 15 to 20 years, now constitutes a threat to national food security, and to the availability of foodgrains at prices which low income households can afford. Imported foodgrains, in periods when international supplies fall short of international demands, cost more than domestically produced wheat, rice, and other agriculturally produced goods.

At the same time, domestic competition for land for non-agricultural uses has intensified. Accelerated GDP growth demands more roads, dams, airports, industrial estates and housing. Urbanisation also means that increasing areas are no longer available for cultivation. Internationally, countries which do not have enough land to grow crops to feed their populations, and therefore have to import most of their food, are increasingly seeking land abroad for crop production. Their efforts to do so often are not welcomed by agricultural producers in the host country.

In general, the land purchasers, national or international, are in a much stronger bargaining position than the sellers. Those who are in a position to buy up, expropriate or otherwise acquire control over land are, to an extraordinary degree, in denial about the domestic implications, economic and political, of what is happening at home, or abroad. In India, State governments in recent years have gone in for "massive acquisition of agricultural land from farmers" … "in violation of mandatory procedures and the rules of natural justice." (These are the words of a recent, (23rd November 2011), Indian Supreme Court Judgment which ruled in favour of an aggrieved farmer.)

These Notes are organised in three main parts. Part I looks at examples of three approaches to land use and land acquisition issues. Two are from international organisations – the FAO and IFPRI – and concerned primarily with the acquisition of large tracts of farm land in developing countries by foreign investors, including Indian investors, and one is exemplified by a recent Indian Supreme Court judgment. Part II seeks to come to grips with the specific features of India's agricultural and agrarian crises, and to make a distinction between the two. Part III deals with long term trends in land use in India, outcomes in terms of average area owned, the size distribution of land holdings, and declining land/man ratios. Part IV looks at the corresponding long term trends in agricultural worker productivity and the impact of declining land/man ratios on agricultural worker productivity. The paper ends on a political note.

***Part I: Three Landmark Documents**:*

[1] At the all India level, in the typical case, a farm household can cover actual consumption expenditures from cultivation only if he possesses 4.01 hectares or more. Less than 5 percent of farmer households belong to this fortunate operational holdings group. Details are given in *Situation Assessment of Farmers*, Report No. 497 NSS 59th Round (Jan-Dec 2003), Table 6.

In the official international literature concerned with food security and land use, two divergent approaches appeared following the food price crisis of 2007-08. One was mainly concerned with agricultural land as an input into food production; the other with what was happening to the people most directly dependent on the land. In India, a recent landmark judgment by the Supreme Court may have served to slow the pace of domestic primitive accumulation, but it must be said that this judgment on land grab by State governments is against the stream.

i)*The IFPRI Policy Brief (2009), 'Land Grabbing' by Foreign Investors in Developing Countries:*

IFPRI's 1999 Policy Brief is concerned about unequal power relationships between people in developing countries who are losing their land and the international investors who are acquiring it.

In May 1999, a spate of news reports about extensive government-backed and private land purchases abroad for *agricultural* uses alerted the Indian public to the fact that this was happening, and that India was involved in it.[2] Much of this reporting was in response to the publication of the *International Food Policy Research Institute* (IFPRI) Policy Brief titled "*Land Grabbing" by Foreign Investors in Developing Countries.*[3] India and China, both populous countries with food security concerns, were among those seeking land to produce food in Africa "where production costs are much lower and where land and water are more abundant"[4]

At the international level, IFPRI was concerned that the unequal power relations in such land acquisition deals "can put the livelihoods of the poor at risk."[5] The inequality in bargaining power when smallholders whose land is being acquired for foreign agricultural projects was underlined. As the 2009 IFPRI report put it: the "deals may not be made on equal terms between investors and local communities. The bargaining power in negotiating these agreements is on the side of the foreign firm, especially when its aspirations are supported by the host state or local elites."[6] At an April 2009 meeting in Addis Ababa, African Union representatives expressed their concerns. They said that vast tracts of land were being taken over without benefit to local people in the world's hungriest continent. Riots had already taken place when local populations were not consulted before land was acquired.[7]

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[2] See, *Hindustan Times*, 4 May 2009, page 1, *"India Joins Race for Land in Africa: China Way Ahead"*, and *Business Standard*, 8 May 2009, page 9, *"An International Land Market"*. At that time the Indian public was accustomed to reading news reports about conflict over domestic land acquisition for non-agricultural uses, but this was something new.

3Von Braun, Joachim and Ruth Meinzen-Dick (2009) *"Land Grabbing" by Foreign Investors in Developing Countries: Risks and Opportunities*, IFPRI Policy Brief No 13, (April).

[4] IFPRI Policy Brief No 13, page 2.

[5] IFPRI Policy Brief No. 13, 2009, page 4.

[6] Page 4, *ibid*.

[7] Reuters report, dated 28 April 2009, available at www.reuters,com.

The applicability of the same logic to domestic competition for land for *non*-agricultural uses, with or without access to water was obvious. What the IFPRI report suggests is that strong local collective action institutions can correct "these power issues." They say, by "acting collectively the poor can stimulate a shift in the power relations, which … can help preserve livelihood options. These efforts can be even more effective when civil society gets involved on behalf of the poor."[8]

In short, in the words of the IFPRI Policy Brief: "Land is an inherently political issue across the globe."[9]

ii):The FAO Background Paper (2011) on the Global Soil Partnership (GSP).

The *Global Soil Partnership (GSP)* focusses on land as an input into world food production and, potentially, into global climate change mitigation. People as consumers enter the picture, but people as producers do not, except perhaps in their capacity as members of the set of "major stakeholders and institutions involved in soil related issues."[10] It was launched at the *Food and Agriculture Organisation (FAO),* Rome, on 7th September 2011. The GSP is designed to complement the *Global Water Partnership (GWP),* initiated by the UNDP and the World Bank in 1997. Excerpts from an FAO Background Paper titled *Towards a Global Soil Partnership for Food Security and Climate Change Mitigation and Adaptation* brings out the central features of their approach.

"Soils provide the basis for food production. Fertile soils are limited and are increasingly under pressure by competing land uses for cropping, forestry, and pasture/rangeland but also for energy production, settlement and infrastructure, raw materials extraction, etc. Maintaining the needed minimum amount of soils for feeding the growing population of the world and meeting their needs for biomass (energy), fibre, fodder and other products should be one of the guiding principles of the GSP."… "Increasing soil degradation processes due to land use changes are threatening this resource and urgent action is needed to reverse this trend if we want to assure the necessary food production for future generations."[11]

iii)*An Indian Supreme Court Judgment (23rd November 2011)*:

On 23rd November 2011, India's Supreme Court slammed State governments for their use of the 1894 *Land Acquisition Act* for the "massive acquisition of agricultural land from farmers" by means of the issue of notifications in violation of mandatory procedures and the rules of natural justice.[12]

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[8] Page 5, *ibid*.
[9] Page 4, *ibid*.
[10] See page 7 of the 2011FAO Background Paper, which refers to "an extensive consultation process."
[11] These quotations are from pages 1 and 2 respectively of the FAO Background Paper, as updated on 13th September 2011.
[12] This judgment was widely reported in the Indian press, including *The Hindu*, 25th November 2011 page 1, and the online edition of the *Indian Express*, (posted online 28th November 2011). The case which elicited this judgment was one in which a farmer, Raghbir Singh Sehrawat, had lost his land when it was

The Court pointed out that the emergency clauses under the 1894 Act were being used in a "very casual" manner by State Governments, and commented that: "It is difficult, if not impossible, to appreciate as to why the State and its instrumentalities resort to" measures which not only affect farmers adversely but also generate huge litigation and adjudication which "consumes substantial time of the courts". The Court also noted that the inevitable delays in cases filed by land owners and others "might not be of much significance when the state and its agencies want to confer benefit upon private parties by acquiring land in the name of 'public purpose'."

Citing the *Report of the National Commission on Farmers*[13], (Fifth and Final Report, 4th October 2006), the Court noted that the mindless acquisition of agricultural land in the name of planned development or industrial growth would adversely affect the future availability of food. Prime land must be conserved for agriculture and not diverted for non-agricultural uses.

This judgment, however, is not consistent with the revealed policy preferences of Indian governments.

Part II: India's Lost Decade for Agriculture and Agricultural Workers.

The decade from the mid-90s to the mid 2000s was a lost decade, both for Indian agricultural development and for Indian agricultural workers. The outcome has been both an agricultural development crisis and an agrarian crisis.

The most obvious symptom of the onset of the agricultural crisis was the slowdown in agricultural growth from the mid nineties to the early 2000s. The slowdown occurred in all subsectors of agriculture, including livestock and horticulture.

Immediately behind this slowdown was the stagnation of yield growth rates, especially with respect to foodgrains, and the decline in public investment in rural infrastructure, from irrigation and flood control to rural electrification and roads. The share of formal institutional credit directed towards agriculture declined and input prices rose. Simultaneously, the stagnation of per capita food consumption depressed the demand for foodgrains and other agricultural commodities.

In this context, at a time when world prices of agricultural commodities were falling, India dismantled quantitative restrictions on imports and reduced tariffs. During the period 1996 to 2004, "the burden of falling international prices fell on farmers." The vast

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acquired by the Haryana government in 2006. His writ petition against the acquisition had been dismissed by the Punjab and Haryana High Court. *The Hindu* reported that the Supreme Court allowed his appeal against this judgment, set aside the acquisition as illegal, and directed the State government to pay him Rs. 2.50 lakh towards costs.

[13] Government of India, Ministry of Agriculture of Agriculture (4th October 2006), *Final Report of the National Commission on Farmers*, (Swaminathan Commission.)

majority – roughly 80 percent of them – who cultivated one hectare or less, were in no position to gain from the subsequent rise in world prices.[14]

During the later, high GDP growth period, agriculture continued to grow relatively slowly. This produced a set of structural changes decidedly unfavourable to agricultural workers. The share of agriculture in GDP declined rapidly, but there was no corresponding decline in the share of the agricultural labour force. Rapid GDP growth in the formal sector combined with low or negative growth in formal employment was offset in part by a proliferation of low productivity self employment in the informal economy.

To top it all off, cultivators were losing their land to private and public 'development projects', often unwillingly and without appropriate compensation, at a time when the increasing marginalization of agricultural holdings was associated with declining growth rates in per agricultural worker productivity. The result was widespread distress and the rise of suicides among farmers.

In a book about agricultural distress and farmer suicides, Radhakrishna (2009) identified two 'dimensions' of agricultural distress – an "agricultural development crisis (reflected in low growth, declining profitability of agriculture) and agrarian crisis (reflected in growing landlessness and casualisation of labour in agriculture, unchecked proliferation of small and marginal holdings, fragmentation of land holding, and widening gap between rural and urban areas."[15]

The authors describe an *agrarian crisis* as "structural and institutional in nature." An *agricultural crisis*, "on the other hand may be seen in terms of performance of production in relation to the problems associated with use of inputs and realisation of returns."[16]

In the case exemplified by recent Indian experience, the definition of an agrarian crisis may be elaborated as follows.

India's agrarian crisis is a product of institutional and structural factors which limit the range of livelihood choices available to agricultural workers. Foremost among them is the loss of control over the means of production and narrowing of the range of possible alternatives. Incapacity to cope with material circumstances and risk engenders the sense of hopelessness that characterises agrarian distress in its most obvious expression, rising farmer suicides. The fact that 40 percent of farmers said that they would get out of agriculture if they could is a milder expression of the sense of restricted choice with respect to agriculture as a means of livelihood.

[14] For the approach of this and subsequent passages, the author is heavily indebted to R. Radkrishna, (2009), Forward, in D.Narasimha Reddy and Srijit Misra (eds), *Agrarian Crisis in India*, Oxford University Press. The quotation is from page xv of the Forward.
[15] Page xvii of the Forward by R. Radhakrishna in D. Narasimha Reddy and Srijit Misra (eds) (2009) *op cit*.
[16] Preface, page xxvix, *ibid*.

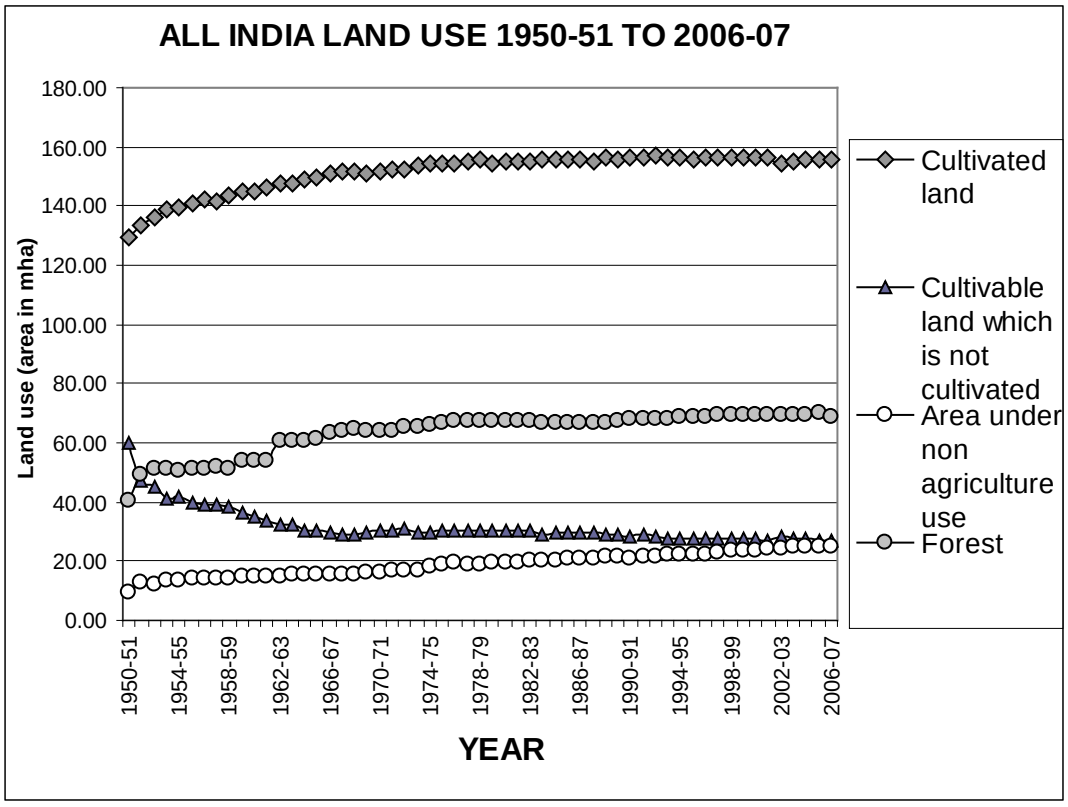
Part III: Long Term Trends in Land Use in India and Outcomes in terms of Average Area Owned, the Size Distribution of Land Holdings and Declining Land/man Ratios.

The four key categories of land use in India are: i) *cultivated land*, defined as net sown area plus current fallows; ii) *cultivable land which is not cultivated*; (This consists of land under miscellaneous tree crops and groves, culturable waste land and fallow land other than current fallows.) iii) *area under non-agricultural uses*; and iv) *forests*. The trends, from 1950-51 onwards, are illustrated in figure 1.

To begin with something needs to be said about what is *not* shown in figure 1.

India's geographical area, from the start of land use statistics in 1950-51, has remained unchanged at 328.73 million hectares. However, the *reporting area* for land utilisation statistics, which is also not shown in the charts, rose significantly from 284.32 million ha to 303.76 million ha in the two decades from 1950-51 to 1970-71. Thereafter it rose very gradually, reaching 304.16 ha in 1980-81 and fluctuating between 304.16 in 1980-81 and 305.40 in 2005-06.

Figure 1: All India Land Use – 1950-51 to 2006-07



The early increases in reporting area have an obvious upward impact on reported area under forests and on reported cultivated area, both shown on the graph. Area under forest

as a percent of reporting area rose by 8 percentage points from 14.2 percent in 1950-51 to 22.2 percent in 1980-81. Subsequent gains were more or less continuous, but small and very gradual, reaching a high of 27.9 percent or 69.79 million hectares in 2005.06. These relatively recent small, gradual gains reflect net successful efforts at reforestation.

The crucial variable here is cultivated area, (net sown area plus current fallows). Cultivated area rose steadily until 1989-90, stabilised for more than a decade at about 156 million hectares, then showed symptoms of tailing off after the drought of 2002-03.

The relative stability of cultivated area from 1989-90 onwards led some people to describe cultivated area in India as fixed, for all practical purposes. But this relative stability is the product of dynamic changes. Cultivable land which was not cultivated contracted, as did area classified as barren and uncultivable. This tended to push cultivated area up. At the same time, the area under non-agricultural uses rose steadily from 19.66 million ha in 1980-81 to 25.03 million ha in 2005-06. That is, more than two million hectares per decade was shifted to non-agricultural uses in the most recent period.

In short, what appears to have happened is that the persistent shift of land to non-agricultural uses finally cancelled out, and then reversed, the positive impact of the gradual conversion of cultivable wasteland and barren land into cultivated land. Data for the period 1990-91 to 2006-07 shows that, for the first time since land use data has been officially recorded, both current fallows and net area sown have contracted. If the tide has really turned against the expansion of net sown area, and this is not just a temporary trend reversal, then it is a serious matter.

A pessimistic conclusion is supported by NSS 59th Round land ownership data. According to NSS Report No. 491, estimated area owned declined from 117 million hectares in 1992 to 107 million ha in 2003, a contraction of owned area in rural areas by 10 million ha in just over a decade! As the NSS Report puts it: "… there is no apparent reason for the decrease in area owned except that some rural land might have been merged in urban land due to urbanisation over the years."[17]

Table 1, shows data for a larger number of land use categories, for triennia centred on 1950-51, 1965-66, 1980-81, 1990-91 and 2006-07.

The story in table 1 begins with huge reductions in the area which in 1951 was classified as i) cultivable land which is not cultivated and ii) barren and unculturable land – items 4 and 1 ii) in table 1 respectively. Cultivated land, and its major component, net sown area, expanded rapidly between 1950-51 and 1980-81. This was the period during which most of the growth in agricultural output was attributable to increases in the area under cultivation. During the same period, there was also a substantial increase in area under non-agricultural uses, which was not much noticed at the time, perhaps because it posed no threat to the area available for cultivation. However, by the early 1980s, the possibilities of extending net sown area were beginning to get exhausted.

[17] See NSS Report No. 491, *Household Ownership Holdings in India 2003*, page 11.

Subsequently, additions to cultivated area were more modest. Between 1980-81 and 1990-91, reductions in areas classified as cultivable land which was not cultivated and barren and uncultivable were less spectacular. Area shifted to non-agricultural uses was less in this decade than ever before or since.

But what is most important here is the trend reversals which took place after 1990-91. For the first time since land use records were compiled in independent India, net area sown and cultivated area as a whole contracted. There was a substantial increase in area under non-agricultural uses which could not be compensated for by reductions in barren land, land under miscellaneous tree crops and culturable wasteland. In this process, while some good quality land was lost to non-agricultural uses, cultivation was extended, increasingly, to poorer quality land.

Table 1 : Changes in Area Under Specified Land Use: All India – 1950-51 to 1965-66, 1965-66 to 1980-81, 1980-81 to 1990-91, 1990-91 to 2006-07, 1990-91 to 2003-04 and 2003-04 to 2006-07.

(000 ha)

Land Use Categories	1950-51 To 1965-66	1965-66 To 1980-81	1980-81 To 1990-91	1990-91 To 2006-07
1.Not Available for Cultivation	238	-9412	1052	1787
i) Area under non-agric. Uses	4300	4305	1642	3760
ii) Barren and un-culturable land	-4062	-13718	-590	-1973
2. Cultivated Land	18490	5039	1501	-783
i) Current fallows	380	1945	-545	-351
ii) Net area sown	18110	3094	2046	-432
3.Cultivable Land	-4873	4989	106	-2563
i) Land under misc. tree crops, groves	-9786	-452	177	-414
ii) Culturable waste land	-6435	-375	-1595	-1910
iii) All fallow lands	-6762	2721	-521	194
a) Fallow lands except current fallows	-7142	777	24	545
b) Current fallows	380	1945	-545	-351
iv) Net area sown	18110	3094	2046	-432
4. Cultivable Land Not Cultivated	-23362	-50	-1395	-1780
5. Categories Not Covered Above	23988	3188	-467	182
i) Forests	17099	5681	227	1098
ii) Permanent pastures, other grazing lands	6890	-2494	-694	-916
6. Reporting Area for Land Utilisation Statistics	19354	-1238	693	390

Source: *Agricultural Statistics at a Glance*, Directorate of Economics & Statistics, Ministry of Agriculture, various issues.

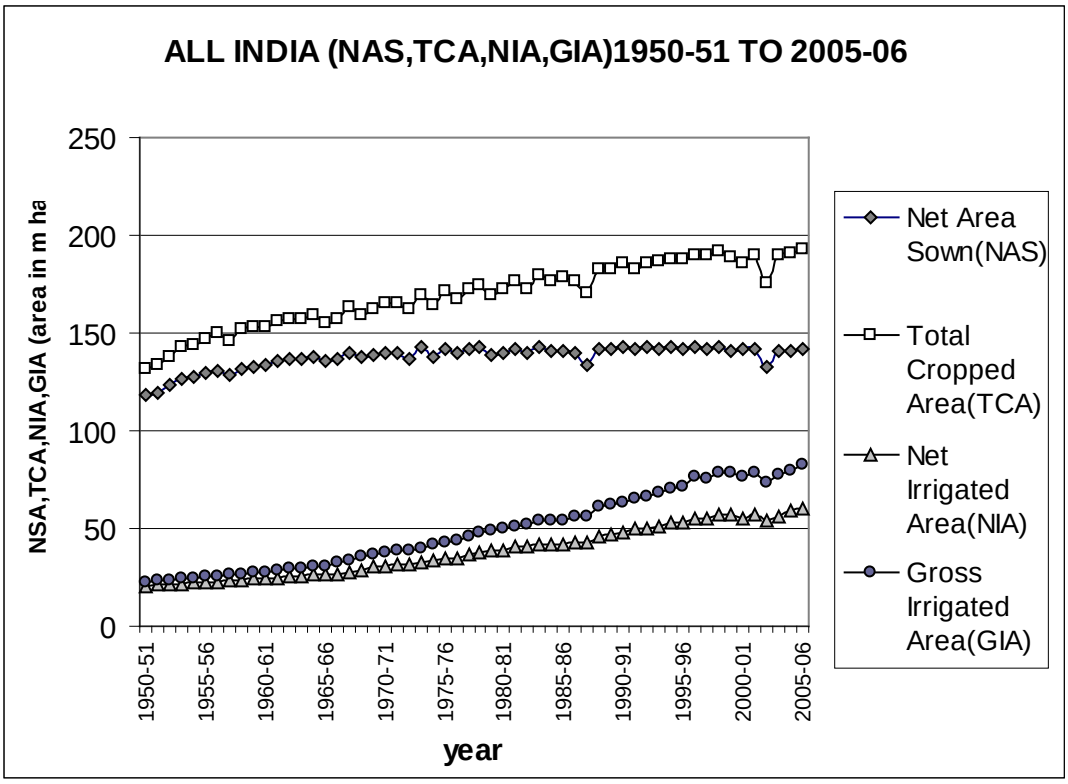
Notes: i) The 2002-03 drought pulled down 3-year averages centred on 2003-04.

ii) Cultivable land which is not cultivated is derived as Cultivable land *minus* Cultivated land.

Net area sown, however, is not everything. (See figure 2.) If irrigation can be extended to fresh areas fast enough, the growth of area which is double cropped may compensate, or even more than compensate, for any decline in net area sown. The data behind figure

2, however, shows that matters are not quite so simple. The impact of other factors is such that total cropped area may not go up much despite substantial increases in gross irrigated area. (For example, between 1998-99 and 2005-06, gross irrigated area went up by more than 4 million ha, but total cropped area increased by a mere 110 thousand ha. This was not enough to compensate for the decline in net sown area of 850 thousand hectares.)

Figure 2: Net Sown Area, Total Cropped Area, Net Irrigated Area and Gross Irrigated Area: All India 1950-51 to 2005-06



Outcomes in Terms of Average Area Owned and Size Distribution of Land Holdings.

NSS data on ownership holdings[18] indicates that owned area in rural areas has gone down from 129 million ha in 1961-62 to 117 million ha in 1992 and then to 107 million ha in 2003.

This was associated with a rapid decline in average area owned per household, and an in increase in inequality in the distribution of owned area among households. Average owned area of those who owned some land fell from 2.01 ha per household in 1961-62 to 1.14 ha in 1992, and then to only 0.81 ha in 2003. (Average operated area of operational holdings is

[18] See NSS 59th Round Report 491, *Household Ownership Holdings, 2003*, table 3.2 page 16.

bigger, but the trend is the same.) Gini's coefficients for owned area, (which measure the degree of inequality in the distribution of owned area among households), and which had remained constant at 0.71 in 1971-72, 1982 and 1992, rose to 0.74 in 2003. Table 2 gives details for all India on the characteristics of ownership holdings for four decades from 1961-62 to 2003.

Table 2: Household Ownership of Land: Rural India by NSS Rounds - 1961-62 to 2003

Item	1961-62 17th	1971-72 26th	1982 37th	1992 48th	2003 59th
1. Estimated number of households (million)	72.3	78.2	93.5	116.2	147.8
2. Estimated area owned (million ha)	128.7	119.6	119.7	117.4	107.2
3. Average area (ha) Owned per household	2.01 (1.78)	1.69 (1.53)	1.44 (1.28)	1.14 (1.01)	0.81 (0.73)
4. Estimated number of landless households	8.4	7.5	10.6	13.1	14.8
5. Percentage of landless Households	11.68	9.64	11.33	11.25	10.04

Source: Based on NSS 59th Round Report No 491, Statement 2, page 11, and Statement 3, page 12.

Notes: i) Average area owned in item 3 excludes landless households. Figures in brackets in item 3 are average area owned per household including landless households.

ii) Report 491 did not give estimates for the total number of households including landless households, except for the 59th Round. Estimates in items 1 and 4 have been derived from those given in lines 2 and 3, and 5, respectively. .

However, NSS ownership holdings estimates need to be taken with a grain of salt. As Rawal (2008) has pointed out, the NSS surveys underestimate the extent of inequality in both ownership and operational holdings because owners of large holdings under report the extent of their owned land, while at the other end of the size class scale, landlessness is also seriously underreported.[19] Rawal (2008) estimates that landlessness in the sense of owning no land other than a homestead was in the neighbourhood of 42 percent in 2003 in India as a whole.

There is a social group dimension to the average area owned per household figures too, which needs to be mentioned. In 2003, Scheduled Tribe households recorded a per household owned area of 0.727 ha. Members of Scheduled Caste households owned, on the average, only 0.304 ha. Other Backward Class households owned 0.758 ha. "Others", reported per household owned area of 1.003 ha. Table 3 gives the details.

[19] On this, see: Rawal, Vikas (2008) "Ownership Holdings of Land in Rural India: Putting the Record Straight", in *Economic and Political Weekly*, Vol XLIII, No 10, March 8 – 14.

Table 3: Average Area Owned per Household by Social Group and Share in Households of each Social Group: Rural India, 2003

State	Characteristics	Social Group				
		ST	SC	OBC	Others	All
Rural India	Average Area Owned (ha)	0.767	0.304	0.758	1.003	0.725
	Share in Households (%)	10.5	21.6	41.6	26.3	100

Source: NSS 59th Round Report No 491, Statement 1R Pages A-13 and A-15.
Notes:-i) ST- Schedule Tribe; SC Schedule Caste; OBC-Other Backward Class.

Marginalisation of Agricultural Holdings

In India today, the extent of marginalisation of rural ownership holdings by size category is the definitive feature in the lives of agricultural workers and the conditions of agricultural production. By 2003, in India as a whole, roughly 80 percent of all ownership holdings belonged to the marginal, (1.000 ha or less), size category. Altogether, 96 percent of households owned holdings of 4 ha or less in 2003.

Table 4: Share of Ownership Holdings by Size Category: Rural India by NSS Rounds, 1971-72 to 2003.

Category of Holdings	Share of Ownership Holdings by Size Category.			
	1971-72 26th	1982 37th	1992 48th	2003 59th
1. Marginal (1.000 ha or less)	62.62	66.64	71.88	79.60
2. Small (1.001-2.000 ha)	15.49	14.70	13.42	10.80
3. Semi-medium (2.001-4.000 ha)	11. 94	10.78	9.28	6.00
4. Medium (4.001-10.000 ha)	7.83	6.45	4.54	3.00
5. Large (>10.000 ha)	2.12	1.42	0.88	0.60

Source :- NSS 59th Round Report No 491, Statement 5, page 19.

Outcomes in terms of land/man ratios.

While cultivated area changed very little from 1972-73 to 2004-05, the number of rural agricultural workers[20] increased. In 1971-72, in India as a whole, there were roughly 168 million agricultural workers; in 2004-05, their numbers had increased to 249 million. As

[20] The number of agricultural workers is measured here in terms of the NSS *usual principal and subsidiary status* measure. Land is measured as cultivated area, (net sown area plus current fallows.)

a result the all-India land/man ratios fell from 0.9 ha per agricultural worker in 1972-73 to only 0.6 ha per worker in 2004-05.

The outcome has been a long term decline in land/man ratios, the most recent period being characterised by an accelerated reduction in land/man ratios, as shown in figure 4.

Figure 3: All India Cultivated Area and Agricultural Workers: 1950-51 to 2006-07

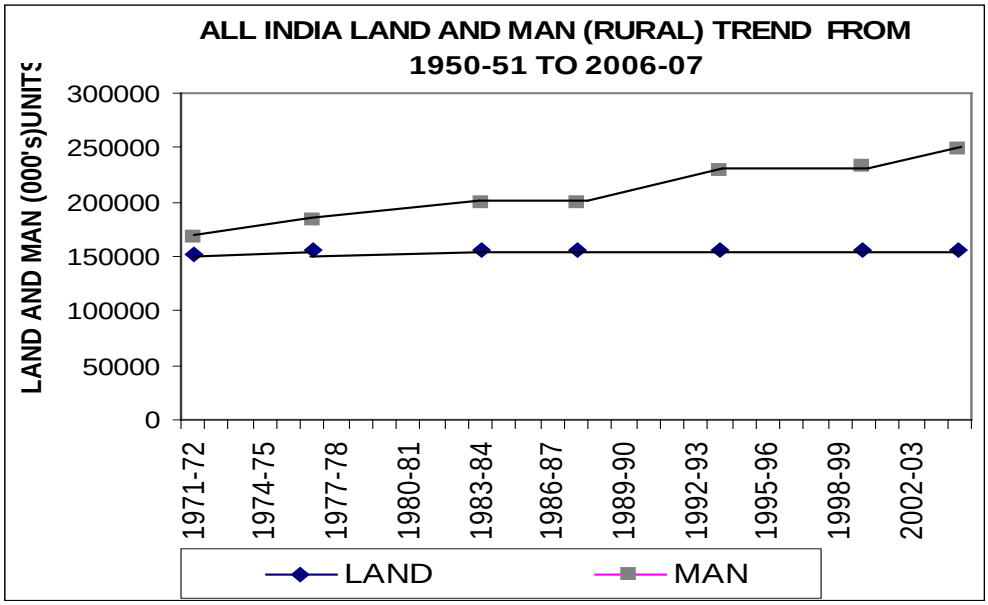
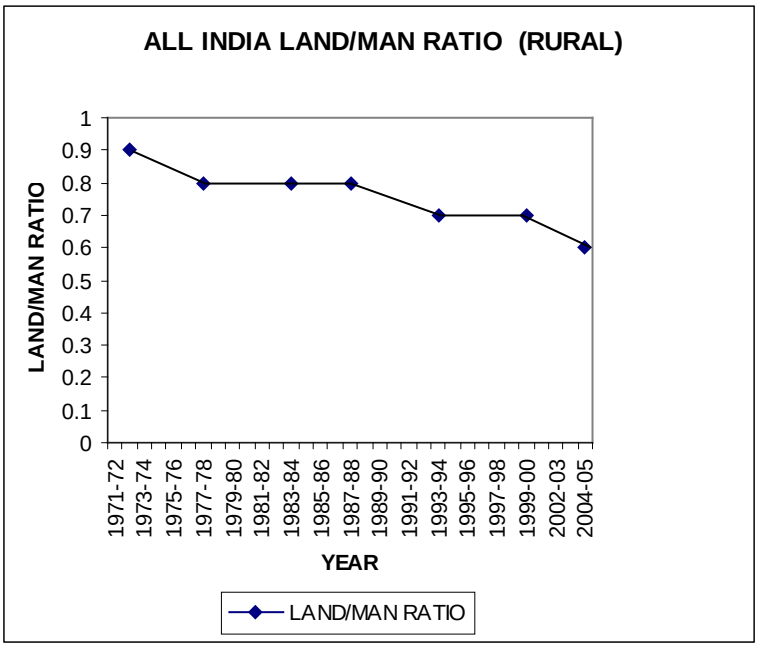


Figure 4: All India Rural Land/Man Ratios 1972-73 to 2004-05



Part III: Long Term Trends in Agricultural Worker Productivity and the Impact of Declining Land/man Ratios.

In India as a whole, agricultural worker productivity has grown exceedingly slowly over the entire period since Independence. From the immediate pre-Green Revolution years, (1962-65), to the 2003-06 triennium the growth rate of agricultural labour productivity was just 1.07 percent per year. This is what lies behind the widening gap between GDP per worker in agriculture and GDP per worker in non-agriculture.

In the initial years of the Green Revolution, (1962-65 to 1980-83), the impact of the introduction of HYV seeds on production growth was extremely limited. This was, first, because the adoption of the new technology was confined to a very few states, and secondly, because the proportionate shift of workers out of agriculture had barely begun. (In fact, there was a shift *into* agriculture in the early 1970s, which petered out as mechanisation was increasingly introduced from the late 1970s onward.) The golden years for agricultural worker productivity growth were in the decade of the 1980s. The "liberalisation era," from 1991 onwards was marked by a decline in the growth rates of agricultural labour productivity. During the period 1990-93 to 2003-06, at the all India level, agricultural worker productivity growth collapsed to half of what it had been in the 1980s, and somewhat less than during the early Green Revolution period – 1962-65 to 1980-83. At the state level, in this post 1991 period, characterised by the highest per capita GDP growth rates ever, in 11 out of 17 major states, agricultural labour productivity growth rates decelerated and four of these major states suffered negative agricultural labour productivity growth. Details are given at the bottom of table 5.

Table 5: Trends in Per Worker Productivity in Agriculture, All India, with Notes on State Level Variations and Changes: 1962-65, 1980-83, 1990-93, 2003-06

Agricultural Worker Productivity (Rs per Agricultural Worker, 1990-93 prices)				Annual Compound Growth Rates (%)			
1962-65	1980-83	1990-93	2003-06	19962-65 to 1980-83	1980-89 to 1990-93	1990-93 to 2003-06	1962-65 to 2003-06
4, 333	5,068	6013	6,708	0.88	1.72	0.85	1.07
Coefficients of Variation for 17 States				Coefficients of Variation for 17 States			
60.25	71.66	82.23	87.17	144.14	78.23	183.11	71.07
States where Agricultural Labour Productivity Declined (Number and Name)				States where Growth Rates Decelerated (Number and Name)			
1962-65 to 1980-83	1980-83 to 1990-93	1990-93 to 2003-06	1962-65 to 2003-06	1980-83 to 1990-93 over 1962-65 to 1980-83		1990-93 to 2003-06 over 1980-83 to 1990-93	
5	2	4	1	4 out of 17		11 out of 17	
Bihar, Kerala, Orissa, Tamil Nadu, West Bengal	Bihar Gujarat	Bihar, Haryana Himachal Pradesh Tamil Nadu	Bihar	Assam, Gujarat, Jammu & Kashmir, Uttar Pradesh		Bihar, Haryana, Himachal, Karnataka, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal	

Source: G.S. Bhalla and Gurmail Singh (2009) Untitled Manuscript. Draft table 2.9.
Note: Absolute numbers for agricultural labour productivity in 17 states is given in Table 6.

Concurrently, interstate disparities in per worker productivity growth rates, which had been very high in the initial Green Revolution period, moderated tremendously during the 1980s as the new technologies spread to new regions and new crops. But then they shot up to unprecedentedly high levels during the period from the 1990's onward. Despite these unequal rates of growth, interstate disparities in *levels* of per worker productivity remained *relatively* moderate, rising from a coefficient of variation of 60.25 for the pre-Green Revolution triennium to 87.17 for the most recent triennium.

Just how much inequality these coefficients of variation imply may be brought home by comparing the levels of per worker productivity in the top states and the bottom

ones. In 2003-06, agricultural worker productivity in Punjab, was twenty times that in Bihar. Details are given in table 6.

Table 6: Levels of per Worker Productivity in Agriculture in Seventeen Major States: 1962-65, 1980-83, 1990-93, and 2003-06 (in constant 1990-93 prices)

Sl. No.	States	Agricultural Worker Productivity (Rs. Per Agricultural Worker)			
	North-West Region	**1962-65**	**1980-83**	**1990-93**	**2003-06**
1.	Haryana	8,460	12,940	17,579	15,447
2.	Himachal Pradesh	2,091	2,677	3,088	2,584
3.	Jammu & Kashmir	2,029	2,986	3,132	3,569
4.	Punjab	12,937	19,982	28,170	34,255
5.	Uttar Pradesh	3,947	5,472	6,421	6,649
	Eastern Region				
6.	Assam	3,997	5,382	5,675	7,001
7.	Bihar	2,899	2,295	2,276	1,749
8.	Orissa	5,019	4,841	6,154	6,223
9.	West Bengal	5,022	4,668	7,409	8,307
	Central Region				
10.	Gujarat	6,068	7,504	6,966	11,830
11.	Madhya Pradesh	3,496	3,772	4,686	5,196
12.	Maharashtra	4,033	4,266	4,530	5,781
13.	Rajasthan	3,358	4,239	5,684	6,502
	Southern Region				
14.	Andhra Pradesh	3,883	4,531	5,442	6,994
15.	Karnataka	4,402	5,403	6,205	6,791
16.	Kerala	12,215	40,483	12,348	20,920
17.	Tamil Nadu	4,981	4,447	6,147	5,887

Source: as in Table 5.

Table 6 also records the substantial progress over time of the majority of states from low levels of agricultural worker productivity to higher ones.

In 1962-65, before the Green Revolution got underway, there were two states, (Punjab and Kerala), where agricultural worker productivity was greater than 10,000 rupees per agricultural worker, four where agricultural worker productivity was between 5,000 and 10,000, (Gujarat, Haryana, Orissa and West Bengal), and 11 where agricultural worker productivity was less than Rs 5,000 per worker. By 1980-83, not much had changed. Haryana, one of the pioneering states in adopting HYV wheat production, had been added to the list of states where labour productivity was greater than Rs 10,000; Uttar Pradesh , Assam and Karnataka moved up into the Rs 5,000 to 10,000 category. But two states fell out of the Rs5,000 to 10,000 category into the under 5,000 group: Orissa and West Bengal. Thus in 1980-83, there were still 10 states where agricultural labour productivity was less than Rs. 5,000.

The data for 1990-93 reveal the extent of the improvement which took place during the 1980-83 to 1990-93 period. Two states moved back up into the Rs 5,000 to 10,000 group, (which they had dropped out of in the preceding period), - Orissa and West Bengal. And three new states – Andhra Pradesh, Rajasthan and Tamil Nadu - rose into this middle level group for the first time, making this middle productivity category the largest group for the first time, with 9 out of 17 members.

The most recent period recorded further, but more modest gains. Gujarat joined the over Rs 10,000 group, thanks in part to the Bt cotton revolution, bringing its numbers to 4: Haryana, Punjab, Gujarat and Kerala. The middle productivity group added two new members, Madhya Pradesh and Maharashtra, bringing the total group membership to 10. Only three states were left in the under Rs5,000 group: Himachal Pradesh, Jammu and Kashmir and Bihar.

What caused the slowdown in agricultural worker productivity growth in the 1990-93 to 2003-06 period?

Immediately behind the observed growth rates of agricultural worker productivity lie two factors: i) the growth rates in the value of agricultural production, and ii) the growth rates of the agricultural workforce. Ideally, to increase the rate of growth of agricultural worker productivity, agricultural production growth rates should accelerate and agricultural workforce growth rates should slow down and eventually become negative, as workers shift into more productive employments outside agriculture. The relative importance of these two factors in determining agricultural worker growth rates in India, is brought out by the figures in table 7.

Table 7 shows that in India, in almost all states, in almost all periods, the number of agricultural workers increased, but at a decelerating rate. The only major states which recorded a decline in the number of agricultural workers, according to *both* the NSS UPSS measure for the 61st Round, (2004-05), *and* Census based projections for the same period, are Kerala and Tamil Nadu. The result is that the generally positive growth rates of the agricultural workforce and the usually but not always positive growth rates in agricultural production have been working in opposite directions.

During the early Green Revolution period, Punjab workers were the most noteworthy beneficiaries of the new HYV wheat revolution. Agricultural output growth rates registered a high rate of growthof nearly five percent. In the absence of equally attractive non-farm work opportunities, workers surged into the agricultural labour force at a rate never seen in Punjab before or since. Observers at the time described the phenomenon driving the shift into agricultural work as the “suction mechanism”. Despite the high growth rate of the agricultural workforce, agricultural worker productivity rose at a rate higher than in any other major state. Haryana also managed high labour productivity rates, thanks to relatively slow workforce growth combined with output growth of 3.72 percent.

In the golden 1980s decade, the growth rates of agricultural production accelerated in all states except Jammu and Kashmir and Punjab. This tended to push up labour productivity growth rates in all major states except these two.

The highest labour productivity growth rates were recorded by West Bengal, (4.73 percent), Punjab, (3.49 percent), Tamil Nadu, (3.29 percent), Haryana, (3.11 percent), and Rajasthan, (2.98 percent). In Rajasthan this was achieved *despite* high agricultural workforce growth rates – another case of the 'suction mechanism' at work. In Punjab, the high agricultural labour productivity growth rate was achieved largely because of a steep

Table 7: Annual Compound Growth Rates of per Worker Productivity in Agriculture, Agricultural Workers, and Value of Agricultural Production (in constant 1990-93 prices)

	1962-65 to 1980-83			1980-83 to 1990-93			1990-93 to 2003-06			1962-65 to 2003-06		
State	Agric worker Productivity	Agric workers	Agric Output	Agric worker Productivity	Agric workers	Agric Output	Agric worker Productivity	Agric workers	Agric output	Agric worker	Agric workers	Agric output
Andhra Pradesh	0.86	1.53	2.40	1.85	1.73	3.61	1.95	0.42	2.37	1.45	1.22	2.69
Assam	1.67	1.15	2.84	0.53	1.96	2.50	1.63	-0.86	0.75	1.38	0.71	2.09
Bihar	-1.29	1.08	-0.22	-0.09	2.34	2.25	-2.01	2.18	0.13	-1.23	1.73	0.49
Gujarat	1.19	1.72	2.93	-0.74	2.15	1.39	4.16	0.81	5.00	1.64	1.54	3.20
Haryana	2.39	1.30	3.72	3.11	1.80	4.97	-0.99	3.33	2.30	1.48	2.06	3.57
Himachal Pradesh	1.38	0.53	1.92	1.44	1.68	3.15	-1.36	2.43	1.03	0.52	1.41	1.94
Jammu & Kashmir	2.17	2.33	4.55	0.48	-0.20	0.28	1.01	-0.14	0.86	1.39	0.92	2.22
Karnataka	1.15	1.43	2.60	1.39	2.01	3.43	0.70	0.60	1.30	1.06	1.31	2.39
Kerala	-0.85	2.18	1.31	1.65	0.4	2.06	4.14	-4.34	-0.38	1.32	-0.36	0.95
Madhya Pradesh	0.42	1.35	1.78	2.19	2.29	4.53	0.80	1.65	2.46	0.97	1.67	2.66
Maharashtra	0.31	1.34	1.65	0.60	1.96	2.58	1.89	0.71	2.62	0.88	1.29	2.19
Orissa	-0.20	1.54	1.33	2.43	1.45	3.91	0.09	0.33	0.42	0.53	1.13	1.66
Punjab	2.44	2.46	4.97	3.49	0.91	4.44	1.52	0.08	1.60	2.40	1.32	3.76
Rajasthan	1.30	1.42	2.74	2.98	2.59	5.64	1.04	2.16	3.22	1.62	0.80	1.21
Tamil Nadu	-0.63	1.53	0.89	3.29	1.32	4.66	-0.33	-0.60	-0.93	0.41	1.94	3.59
Uttar Pradesh	1.83	0.92	2.77	1.61	2.46	4.11	0.27	1.24	1.52	1.28	1.40	2.69
West Bengal	-0.41	1.96	1.55	4.73	1.70	6.51	0.88	1.79	2.69	1.24	1.84	3.10
All India	0.88	1.40	2.29	1.72	2.06	3.82	0.85	0.97	1.82	1.07	1.42	2.51

Source: Based on Tables 2.9 and 2.10 in Bhalla and Singh (2009)

decline in the growth rate of the agricultural work force. In Punjab the rapid diversification of the workforce into non-agricultural activities was triggered off by increases in demand for new kinds of services required by the current input and capital intensive technology and by increased consumption demand induced by rapid growth in rural incomes. In Tamil Nadu, Haryana and West Bengal, a combination of high output growth rates and low or modest agricultural workforce growth produced the rapid improvement in labour productivity.

During the 1980s, in two states, Bihar and Gujarat, the growth rate of agricultural workers exceeded agricultural output growth, with the result that per worker productivity in agriculture declined. Jammu and Kashmir is the only state where the agricultural workforce actually contracted. As a result, despite negligible positive growth in agricultural output, agricultural worker productivity increased – marginally.

In the most recent, "liberalisation era", (1990-93 to 2003-06), only two states registered major gains in agricultural labour productivity. Gujarat and Kerala recorded growth rates of 4.16 and 4.14 percent respectively. Gujarat did well because of exceptionally high growth in the value of output, combined with a low workforce growth rate. Kerala excelled for quite different reasons. Despite negative growth in agricultural output, the very large exit of workers from the agricultural workforce - a negative growth rate of more than 4 percent – produced a high agricultural labour productivity growth rate.

Aside from Kerala, three other states experienced a contraction of the agricultural workforce during the 1990s and afterwards: Assam, Jammu and Kashmir, and Tamil Nadu. In the first two cases, the negative growth of the workforce made it possible to achieve labour productivity growth at rates above one percent, despite very low agricultural output growth of 0.75 and 0.80 percent respectively. Tamil Nadu's case is unique. Agricultural output growth was negative (at -0.93 percent), and the agricultural workforce growth rate was also negative (at -0.60 percent), but the decline in the workforce was not sufficient to prevent negative growth in labour productivity (of -0.33 percent).

Finally, over the entire period from 1962-65 to 2003-04), Bihar is the only state to suffer negative labour productivity growth in all three periods. This happened because, even when agricultural output growth rates were respectable, workforce growth rates were even higher. The other exceptional state is Kerala – the only state to reduce its workforce during the 1962-65 to 2003-06 period as a whole. This has enabled Kerala to maintain better than average labour productivity growth rates over the long run. They did not start out that way. In the initial Green Revolution period, high workforce growth rates cancelled the benefits of their rather modest agricultural output growth. It was only when their agricultural workers growth rates fell to exceptionally low figures in the 1980s and to large negative figures in the 1990s and afterwards that the gains in labour productivity could be achieved.

The Impact of Declining Land/Man Ratios on per Agricultural Worker Productivity

How much land a man tills matters. Output per agricultural worker largely depends on it. Recent analysis[21] of district level data for four triennia , (1970-73, 1980-83, 1990-93 and 2003-06) suggests that more than half of the inter-district variations in the gross value of output per agricultural worker was accounted for by inter-district differences in the land/man ratios.

[21] Bhalla, G.S. and Gurmail Singh, (2010), Draft.

But care needs to be taken in interpreting these results. The value of output per agricultural worker is, of course, quite different from the earnings of agricultural workers. The cultivator gets as his earnings only what is left over after deducting input costs, including the wages of hired workers, if any, marketing costs and so on. And the agricultural labourer gets his wages, in cash or kind or both. But per worker productivity in agriculture provides an upper boundary, the ultimate constraint upon potential earnings for them both.

In India as a whole, agricultural worker productivity has grown exceedingly slowly during the entire period since Independence. From the immediate pre-Green Revolution years, 1962-65, to the 2003-06 triennium, the growth rate of agricultural worker productivity was just 1.07 percent per year. This is what lies behind the widening gap between GDP per worker in agriculture and GDP per worker in non-agriculture.

This dismal all-India performance reflects the fact that while productivity growth rates decelerated in four out of seventeen major states between 1980-83 to 1990-93 as compared to the 1962-65 to 1980-83 period, the record after 1990-93 was far worse. At the state level, in this post 1991 period, characterised by the highest overall per capita GDP growth rates ever, agricultural worker productivity rates decelerated in 11 out of 17 major states, and four of these states suffered negative agricultural worker productivity growth.

The analysis by Bhalla and Singh (2010), suggests that declining land/man ratios have had a major impact on agricultural worker productivity. Two separate exercises using district wise data lead to this conclusion. In both of these cross section analyses the number of agricultural workers is assumed to be exogenously determined and per agricultural worker productivity is hypothesised to depend on per worker use of inputs.

In the first exercise, a ridge regression procedure was adopted to estimate a labour productivity function of the Cobb Douglas (restricted form) type for India as a whole. The results indicate that the land/man ratio accounted for an increasing part of inter-district variations in agricultural worker productivity over time. The coefficient of the land/man ratio was statistically significant and its magnitude increased consistently from 0.364 in the 1970-73 triennium to 0.405 in 1980-83, 0.433 in 1990-93, and to 0.531 in the final triennium, 2003-06. In short, the results suggest that by 2003-06 more than half of the inter-district variations in gross value of output per agricultural worker at 1990-93 prices resulted from inter-district differences in the land/man ratios.

It was concluded that the increasing coefficient of the land/man ratio could be attributed to increasing population pressure on land, given circumstances such that very little shift of workers had taken place out of agriculture into non-agricultural activities.

Another exercise sought to account for state level differences in agricultural labour productivity between each of 16 states and Punjab, (the base state), in 2003-06, by measuring the percentage contribution of each of five sets of district level explanatory

variables to the percentage difference in per agricultural worker productivity as between each of the 16 states and the base state, Punjab. The results are shown in table 8.

At the all-India level and in most, (9 out of 16), states the single most important factor was the land/man ratio. In the remaining seven, technology was the key factor. Altogether, the set of five factors listed in table 2 accounted for roughly 90 percent of the differences in agricultural worker productivity between Punjab and all- India (excluding Punjab).

Table 8: Percent Contributions of Specified Factors to Differences in Agricultural Worker Productivity (Punjab versus others): All India 2003-06 Triennium

India	Percent Contribution of Factors to Differences in Agricultural Worker Productivity					
	Land/Man Ratio	Technology	Cropping Intensity	Infrastructure	Rural Literacy	Residual
India	33.62	28.54	8.68	13.16	3.47	12.53

Source: Bhalla and Singh (2010) Draft

Notes: (i) India excludes Punjab
(ii) The Land/Man Ratio is measured as net sown area per Population Census agricultural worker (projected to 2003-06).
(iii) Technology includes fertilizer per worker, tractors per worker and tubewells per worker.
(iv) Cropping intensity is the ratio of gross cropped area to net area sown.
(v) Infrastructure includes rural roads per worker, markets per worker and irrigation per worker.

In Lieu of Conclusions.

In India the *agricultural crisis* involves mainly economic policy issues. These are amenable to change because appropriate adjustments can be made without unduly upsetting current power equations.

The issues involved in dealing with the *agrarian crisis* are more fundamental. As Radhakrishna (2009) put it: "There is less appreciation in policymaking circles of the fact that tackling the agrarian crisis is far more difficult than reviving agricultural growth."[22] To borrow a phrase from the IFPRI Policy Brief, 'a shift in the power relations' would have to be involved.

[22] Page xviii, Forward, *op cit.*