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FOOD SECURITY: RECENT TRENDS AND MAJOR ISSUES IN INDIA

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Abstract

After independence of India, agriculture sector has grown up in a spectacular way. Up to reforms phase (1991) it was the major achievement of restructure in the Indian economy. Land reforms, improvement in irrigation facilities, more use of chemical fertilizers, use of high yielding varieties, betterment of rural credit system, etc. were the main features of agriculture development in the last 60 years. On one side production of food grains has increased a lot and on other side population has also increased rapidly. If the growth rate of population remains higher than growth rate of food production then there will be insecurity of food. In other words, to attain food security food production has to be more than population growth.

Keywords: *Food Security Farm Size, Capital Formation in Agriculture, Purchasing Power*

Introduction : FAO has defined food security as 'a situation in which all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life'. Despite significant increase in agriculture production more than one billion people, about one out of every six persons suffer form chronic hunger and nutrient deficiencies.

In this paper an attempt has been made to analyse the present status of production and availability of food and also major disturbances in meeting food security like, shrinking farm size, decreasing rate of food production, low rate of capital formation in agriculture and less purchasing power of people.

For this paper we have used the data provided by Economic survey of India, Ministry of Agriculture, Central Statistical Organization, and data from various reports of National Sample Survey. For case study we collected data from Talathi records and Tahshil office.

The review of literature will be useful to understand the problem of food security and issues related to it. According to G.S. Bhalla "It needs to be emphasized that large countries like India cannot entirely depend upon food imports and will have to produce major part of their food requirements domestically." He had suggested that to attain food security in India, to fix minimum support prices at realistic level with a view to bring about balance in the food economy. Prices of foodgrains must be at levels where low-income household can attain their requirement of food. "In developing countries like India, farmers income can only be raised not through increase in prices, but through increased yields, crop diversification, technological changes, and rise in factor productivity." He suggests that private trade should be assigned, zonal restrictions on food grains trade should be removed, need to reform the functioning of FCI, steps must be taken to correct existing deficiencies in the PDS.

Remesh Chand and Praduman Kumar (IARI Delhi) in support of G.S. Bhalla have said that, "In most advanced agricultural regions like Punjab, the agriculture had reached a plateau. Given the present level of technology, the further scope for increasing agriculture output by tampering with prices is limited. At this stage, more reliance has to be placed on technological improvement rather than on prices, for boosting agriculture output". Therefore in this paper we have tried to focus on food productivity rather than food prices.

Objectives: To study the changes in

i. Production, Area and Yield of Important Crops in India
ii. Farm Size,
iii. Capital formation in Agriculture,
iv. Purchasing Power

4. Data collection:

Data have been collected through Economic Survey of India(2008-09), Talathi records and district reports, Nanded (1991&2001)

5. Methodology:

Collected data have been tabulated and interpreted and analysed using quantitative techniques like Compound Growth Rates, Correlation, Regression and Analysis of Variance

6. Recent Trends in Food Productivity and Food Availability

6.1. The share of agriculture in GDP is decreasing continuously; however the agriculture remains an important sector of the economy as more than 60 per cent of people depend on it. Agriculture sector is mainly important for food security, rural employment, and improving the standard of living of rural India. Food security has two sides, one is production of food grains and the other side is management and supply of food to weaker section of the society.

Table I Production, Area and Yield of Important Crops in India

Sr. No.	Crop	Production (Million Tonnes)				Area (Million Hectares)				Yield (Kg/Ha)			
		1980-81	1990-91	2000-01	2007-08	1980-81	1990-91	2000-01	2007-08	1980-81	1990-91	2000-01	2007-08
1	Food grains	129.6	176.4	196.8	230.8	126.7	127.8	121	124.1	1023	1380	1626	1860
2	Cereals	119	162.1	185.7	216	104.2	103.2	100.7	100.4	1142	1571	1844	2151
3	Pulses	10.6	14.3	11	14.8	22.5	24.7	20.3	23.6	473	578	544	625
4	Rice	53.6	74.3	85	96.7	40.1	42.7	44.7	43.9	1336	1740	1901	2202
5	Wheat	36.3	55.1	69.7	78.6	22.3	24.2	25.7	28	1630	2281	2708	2802
6	Oil seeds	9.4	18.6	18.4	29.8	17.6	24.1	22.8	26.7	532	771	810	1115
7	Sugarcane	154.2	241	296	348	2.7	3.7	4.3	5.1	58	65	69	69
8	Cotton (Bale of 170 Kg)	7	9.8	9.5	25.9	7.8	7.4	8.6	9.4	152	225	190	467

Source: Economic Survey of India (2008-09)

The table-I shows the total food grain production which doubled during last three decades, it means yield of agriculture has also doubled during the some period but the area under food grains have decreased marginally. It is quite clear from the table that cereals (especially wheat and rice) have more share in total food grain production. Whereas on the share of pulses is less than 10% in total food grain production. Food security does not mean to make avail food in sufficient quantity but to make avail in sufficient quality too, it should be taken care that the consumption of pulses is increased. It is interesting to see that the yield of sugarcane in higher than other crops, it is so because of research on sugarcane crop and more than 90 percent of area is under irrigation.

6.2 While studying food security what is more important is the availability of food for consumption and not how much we have in stock.

Table- II Net Availability of Food grains, Pulses and Cereals in India

Year	Population	Food grains		Pulses		Cereals	
		Net Availability (*Million tonnes*)	Per day grams	Net Availability (*Million tonnes*)	Per day grams	Net Avai lability (*Million tonnes*)	Per day grams
1951	363.2	52.4	393.3	8	61	44.3	334
1961	442.4	75.7	468.8	11.1	69	64.6	400
1971	551.3	94.3	468.6	10.3	51	84.5	418
1981	688.5	114.3	454.8	9.4	37	104.1	417
1991	851.7	158.6	510.2	12.9	42	141.9	468
2001	1033.2	156.9	416.0	11.3	30	162.5	386
2005	1102.8	170.0	422.6	12.7	31	162.1	391
2006	1119.8	181.9	445.0	13.3	32	170.8	413
2007	1136.5	183.7	442.8	14.7	35	177.7	407

Source: Economic Survey of India (2008-09)

The table II shows the net availability of food articles. During last six decades the net availability of food grains has increased considerably whereas the net availability of food grains in grams per day has also increased, but marginally, it is so because of rapid growth of population. As far the production of pulses is concerned, it has shown decreasing trend since 1971, except 1991. It is so because of shift is area from food grain crops to commercial crops, and percentage change in net availability of foodgrains in grams per day is negative in 1981 and 2001 and an average change during 1951-2007 is 20.05 only.

2.3The table III shows the compound growth rate of production, area and yield of different crops. The period from 1980 to 2008 has been divided into three phases. Phase I is known as pre-reforms and post green revolution, phase II is referred to as first decade of post reforms and phase III is called as second decade of post reforms. During these phases areas under cereals and pulses have shown negative growth whereas cash crops like oilseeds, sugarcane, cotton have shown positive growth.

Table III Compound Growth Rates of Production, Area and Yield

Sr. No.	Crop	Production			Area			Yield		
		I	II	III	I	II	III	I	II	III
1	Cereals	0.4	0	3.3	-1.3	-2.1	-0.4	1.6	0.9	1.7
2	Pulses	1.5	0.6	3.4	-0.1	-0.6	1.9	1.2	1.1	0.3
3	Rice	3.6	2.0	1.9	0.4	0.7	-0.1	3.2	1.3	2.0
4	Wheat	3.6	3.6	1.4	0.5	1.7	1.3	3.1	1.8	0.1
5	Oil seeds	5.4	1.4	7.2	2.5	0.2	3.4	2.5	1.4	3.7
6	Sugarcane	2.7	2.7	2.2	1.4	-0.1	1.9	1.2	1.1	0.3
7	Cotton (Bale of 170 Kg)	2.8	2.3	17.5	-1.3	2.7	1.5	4.1	-0.4	15.8

Source: Economic Survey of India (2008-09)

Note: Phase I 1980-81 to 1989-90;
II 1990-91 to 1999-2000;
III 2000-01 to 2007-08

7. Problems

7.1 Farm Size

It is important to know the causes, which are effecting on food security in India. Eminent scholars in India to investigate the problems of food security have carried out many studies and many of scholars have pointed out that the decreasing farm size is one of the major problems in Indian agriculture. Table IV shows the status of farm size in India. It reveals that the numbers of small and marginal farms are increasing and their area has been decreasing. Increase in the number of marginal farms effect adversely on productivity of agriculture, because they cannot use advanced technology, chemical fertilizers etc. In case of large farms size high productivity of agriculture in also not possible due to diseconomies in large farm management.

Table IV
Number and Area of Land Holding by Size-Group and the Percentage to their Totals

Size Group	Size of Holding (Hectares)	2000-01				1995-96			
		Number (Thousands)	%	Area	%	Number (Thousands)	%	Area '000' hectares	%
Marginal	0-1	75408	62.88	29814	18.70	71179	61.58	28121	17.21
Small	1-2	22695	18.92	32139	20.16	21643	18.73	30722	18.81
Semi medium	2-4	14021	11.69	38193	23.96	14261	12.34	38953	23.85
Medium	4-10	6577	5.48	38217	23.97	7092	6.14	41398	25.34
Large	Above 10	1230	1.03	21072	13.22	1404	1.21	24160	14.79
All		119931	100	159436	100	115579	100	163354	100

Source: Agricultural Census of India (2008-09)

7.2 Capital formation in Agriculture

Inadequate capital formation is one of the major problems in the development of agriculture. In agriculture sector the rules/laws of returns are very imperative, decreasing returns have caused the less capital formation in agriculture by private and public sector.

Table V Gross Capital Formation in Agriculture (Figures in Rs. Crore)

Year	GDP	Agriculture & Allied activities		GCF/GDP in Agriculture & Allied (%)	GCF in Agriculture as % of total GDP
		GCF	GDP		
2004-05	2388768	57849	482446	12.0	2.4
2005-06	266101	66065	511013	12.9	2.5
2006-07	2871120	73285	531315	13.8	2.6
2007-08	3129717	79328	557122	14.2	2.5

Source: Economic Survey of India (2008-09)

Table V – Shows the gross capital formation in agriculture, as percentage of gross domestic product is only 2.4, 2.5, 2.6 and 2.5 for the year 2004-05, 2005-06, 2006-07 and 2007-08 respectively. However agriculture sector accounted 17.8% of GDP in 2007-08 and nevertheless 60% of population depends on this sector. Agriculture must have more capital formation. But it is the most ignored sector of the Indian economy.

7.3 Purchasing Power

Food security has two faces—one, supply (more food production) and two, demand (accessibility of food). Again accessibility has two faces one, the distribution of food through PDS and other sources to needy people, and two, increase in purchasing power of people of lower income groups. In India even after sixty years of independence more than 25 % of the total population lives below poverty line (less than 1 dollar per day). The low purchasing power is due to low employment generation rate and defective implementation of employment generation schemes.

8. A Case Study of Food Security

To investigate food security at ground level we have selected 24 villages of Nanded District of Maharashtra. To carry out study we used survey method to collect data from Talathi (Village Revenue Officer), Gram Panchayat Records, District census handbook and questionnaire. After tabulation and processing of data we applied statistical methods like correlation, and simple liner regression to have better results and understanding.

Table VI – Cropped Area and Availability of Food and Calories in Study Area

Table IV shows, in 1991 the per capita per day availability of cereals in grams was much higher in seven villages than standard requirement (450 gram, per day per capita). There were six villages having per capita per day availability of cereals in grams less then 400 grams and remaining eleven were close to the standard requirement.

In 2001, six villages witnessed much higher per capita per day availability of cereals, in nine villages it was much lesser and remaining nine villages were close to standard requirement.

During 1991 to 2001 the number of villages having much lesser per capita per day availability of cereals in grams have increased from six to nine, which is due to rapid growth in population. So it can be said that the trend is threat to food security.

Sr. No.	Village	Total Population		Gross Cropped Area(hectares)		Per Capita Cultivated Area(hectares)		Availability of Cereals/Capita/ day(grams)		Availability of Pulses/Capita/ day (grams)		Availability of Calories/Capita/ day	
		1991	2001	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
1	Malkapur	239	341	88	97	0.367	0.284	811	386	73	59	3671	2156
2	Narangal	1921	3427	2148	2178	1.118	0.635	841	578	89	82	4561	3384
3	Kabirwadi	512	667	423	497	0.826	0.745	682	742	69	79	5369	3754
4	Nilegavan	482	689	354	367	0.734	0.532	570	628	75	65	4663	2892
5	Saikhed	797	1023	229	242	0.287	0.237	264	175	65	73	2484	2832
6	Dagadpur	462	630	199	217	0.430	0.344	380	206	99	78	2939	3102
7	Malwadi	508	723	238	235	0.469	0.325	418	273	42	41	1856	1422
8	Andbari	1095	1560	758	771	0.692	0.494	465	348	47	69	1832	2142
9	Andbori	1010	1210	705	712	0.698	0.588	799	474	65	95	4104	3142
10	Jahur	2673	3290	767	785	0.287	0.239	428	592	41	43	1724	2419
11	Hangarga	1345	1661	646	752	0.480	0.453	409	387	40	72	3206	1891
12	Yevti	3456	3917	1923	1935	0.556	0.494	442	437	71	85	1921	2785
13	Kohli	2039	2250	1826	1851	0.896	0.823	690	730	102	101	4993	6025
14	Borgadi	620	682	1856	1976	2.994	2.898	389	422	65	46	1373	2033
15	Shivpuri	563	626	532	542	0.945	0.866	417	450	72	105	1704	1995
16	Bhoshi	3459	3804	1391	1429	0.402	0.376	399	490	69	70	2153	2327
17	Therban	1529	1692	1189	1233	0.778	0.729	443	397	61	38	1629	2190
18	Matul	1529	1718	1187	1241	0.776	0.722	397	405	67	42	1665	2160
19	Walki Bk	850	935	441	494	0.518	0.528	444	435	70	47	2033	1903
20	Jangamwadi	478	531	221	266	0.462	0.501	409	430	75	45	1596	1864
21	Risongaon	2911	3227	1317	1516	0.452	0.470	691	730	52	41	3383	3494
22	Kondha	2212	2697	640	665	0.289	0.246	408	439	55	50	2205	2135
23	Hassapur	281	331	189	207	0.672	0.625	410	445	69	58	2241	1916
24	Chilpimpari	789	949	206	219	0.261	0.231	384	311	46	39	2085	1743

So, as far pulses is concerned in the year 1991 nineteen villages had per capita per day availability of pulses in grams more than standard requirement (50 grams per day per capita) and in five villages availability of pulses was less than the required standard. In 2001 fifteen villages had more than and nine villages had less than required standard of pulses. From 1991 to 2001 villages having less per capita availability of pulses in grams have increased from five to nine, which is also a threat to food security at rural levels.

There is no significant change in overall calories consumption during 1991 and 2001. There were only ten villages both in 1991 and 2001 having calories consumption more than standard level (2400 calories per day)

The correlation between availability of cereals and pulses and calories consumption is positive. Table VII shows the details about correlation between different variables. Correlation between all variables is insignificant except calories consumption and cereals consumption. To investigate the relation between calories consumption and cereals consumption we used the following simple linear regression method for both 1991 and 2001.

Table – VII Correlation between Different Variables

Variables ↓ →	Year	PCPDA Cal	PCPDA Cer (grams)	PCPDA Pul (grams	Use HYV/ Hect (kg)	Use Pesticides/ Hect (liters)	Use Fertilisers/ Hect (kg)	% Irrigation to Gross cropped area
PCPDA Cal	1991	1	0.77	0.44	0.09	0.10	0.01	-0.24
	2001	1	0.61	0.56	0.23	-0.05	0.07	-0.17
PCPDA Cer (grams)	1991		1	0.32	0.15	0.15	-0.04	-0.36
	2001		1	0.18	0.43	-0.07	0.13	-0.36
PCPDA Pul (grams)	1991			1	0.06	0.09	-0.03	0.33
	2001			1	0.05	-0.13	0.12	0.01
Use of HYV seeds/Hect (kg)	1991				1	0.23	-0.06	-0.19
	2001				1	0.31	0.05	-0.19
Use of Pesticides/ Hect (liters)	1991					1	0.07	-0.03
	2001					1	0.17	0.11
Use of Fertilisers/Hect (kg)	1991						1	-0.01
	2001						1	0.10
% Irrigation to Gross cropped area	1991							1
	2001							1

Sources: Talathi records and district reports (1991&2001)

To calculate the relationship between availability of calories and cereals, the following linear regression model is fitted

$Yi = a + b Xi$

Where Yi denotes per day per capita availability of calories in different villages, and Xi denotes per day per capita availability of cereals (grams). The results for 1991 are

$Y = -214.44 + 5.88X$

Standard errors (537.05) (1.025) R2 = 0.6

t* (0.399) (5.74)

Value of R2 is 0.6, it means that X explains 60% variation of Y. The value of b is statistically significant at 1% level, however the value of a is insignificant at any significance level. The regression shows that the cereals consumption plays an important role in calorie consumption

For the year 2001 regression results are

$Y = 807.69 + 3.88 X$

Standard errors (512.11) (1.0715) R2 = 0.373

t* (1.577) (3.62)

The regression equation has changed in 2001 but other statistical result are same as 1991.

Analysis of Variance

We used the method of analysis of variance to check whether the relations have changed or not during 1991-2001. For this we have framed null-hypothesis that the relationship between availability of calories per capital per day and availability of cereals per capita per day in grams has not changed form 1991 to 2001. F distribution test in used to analyse the variance. The calculated value of F is 0.212 and this value is far lower than the critical value. It means the null hypothesis is accepted and can be concluded that there is no significant change in the relationship of variables.

5. Conclusion and Suggestions

After more than 60 Years of independence we are still far away from basic amenities like sufficient food, safe drinking water, health care facilities, primary education etc. It happened due to commodity and aristocratic centered economic growth. Economic growth should be inclusive and people centered.

1. Year after year the area under commercial crops is increasing and area under food grain crops in decreasing consistently. To stop this trend, we should have encouraging schemes and innovative

farming techniques for farmers to support food grain production. 2.Decreasing farm size affect adversely on agriculture production to prevent this co- operative and community farming should be encouraged; minimum land holding should be finalized with respect to economic significance.
3. Capital formation is low due low earnings and low saving inverse will be true for high capital formation. Capital formation is possible through.
I .Infrastructure development: electricity transportation and credit facilities. II. Research and development: fertilizers HYV, innovative techniques with respect to climate change. III. Storage and market facilities.The only way to increase purchasing power of people is employment throughout the year irrespective of present seasonal employment. Efficient public distribution system is an effective measure to food security. The present mechanism of PDS is not able to identify the needy households.

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