ORIGINAL RESEARCH PAPER

Economics

DYNAMICS OF EMPLOYMENT AND PRODUCTIVITY IN THE OLD AND NEW IRRIGATED AREAS

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ABSTRACT

The empirical studies reveal that the employment in agriculture sector is almost stagnated and even in the other two sectors viz., secondary and tertiary sectors also it is very much limited. The Corona Pandemic created lot of problems for all the sectors however the ill effect of the same is limited in case of the agriculture sector. Therefore, in this paper an effort is made to examine the employment and productivity differentials between the old and new irrigated areas so that corrective measures can be taken in case of any discrepancy between the two so that the employment and productivity can be enhanced. In this direction, this paper gains importance as the analysis of the primary data and secondary data has been used to examine the same. The paper comes out with the conclusion that the employment generation and productivity has been more in the new irrigated area compared to the old irrigated area as in the new irrigated area the farmers are using more organic manure instead of chemical fertilizers compared to the farmers in the old irrigated area. The farmers in the old irrigated area have been using more chemical fertilizers, which is higher than the advised quantity, therefore, the productivity levels are low.

INTRODUCTION:

In the production process, the labour is an important input in the agricultural sector in India. Unemployment is a major problem in developing countries, the pattern and intensity of labour use has generated more interest as it has implications on cost of production, productivity and employment generation. An experience of the developed countries suggest that an economic growth coincided with the shift in labour force from the agriculture to the non-agricultural sectors (Clark 1957). The growth rate of the employment in the industrial sector is not up to the expected level and therefore, agriculture sector will have to continue to provide employment to many households in less developed countries. If this is the case one has to think in the direction of increase in the cropping intensity, to increase the cropping intensity we need to provide irrigation facilities. In this context an effort is made to study the employment and productivity differentials in the new and old irrigated areas as it will have policy implications. It is needless to mention that the researchers have not collected the data specifically to publish this paper. This paper is prepared as part of the Ph.D. thesis, which is not yet awarded.

By definition there is no clear cut demarcation between the old and new irrigated areas. However, the academicians who have worked on irrigation, clearly say that it is left to the concerned researcher/s to decide what is `Old' and `New' irrigated areas, which has to be according to the requirements of the research issues, which are going to be analyzed. Some experts said "when we are going to work on the productivity differentials between the old and new irrigated areas at least there has to be 30 years gap between the `Old' and `New' irrigation provided. By keeping this as the base, we have considered the old irrigated area as Mandya district and the new irrigated as Davanagere district. Because in Mandya district the irrigation facilities were provided during the year 1932 and in Davanagere district it was during 1980's.

Input Application in the Old and New Irrigated Areas:

The Essential Commodities Act, 1955 has been regulating the production, sale and distribution of fertilizers in the country, through the Ministry of Chemical and Fertilizers in India. They are three major nutrients in the fertilizers viz., first Nitrogen (N), second Phosphatic (P) and lastly Potassic (K). The pricing of the urea containing N is controlled by the Government of India. Presently, Indian agricultural farmers are unaware of the ration of NPK fertilizers used in crop cultivation. The recommended dosage of the use of the NPK fertilizers is 4:2:1, this dosage in India currently is at 6.7:2.4:1. An imbalanced use of fertilizers may lead to loss of fertility in the soil over a period of time (Gulati et.al 2015).

Table-1 presents that both in the 'Old' and 'New' irrigated areas, there is increase in the application of organic manure and chemical fertilizers with the increase in farm size. As the size class increases the application of Organ Manure and Chemical Fertilizers increases. The table clearly reveals that the organic manure is used in larger quantity by the farmers in Davanagere district compared to the farmers in Mandya district. This is mainly because in Davanagere the bovine population is more compared to Mandya district and more over the farmers in Davanagere area strongly believe that they need to apply more organic manure to get better yield (Filed Information). The same table reveals that the Mandya farmers have been using more chemical fertilizers, which is against the advice of the extension officials (University of Agricultural Science in Mandya)

Table-1: Quantity Of Organic Manure and Chemical Fertilizers Applied for Agricultural Crops in Old Irrigated Area and New Irrigated Areas (Per Acre/Per Crop).

Sl. No.	Size Classes & Crops	Mandya District		Davanagere District	
		Organic Manure (Tonnes)	Total Chem. Fertilizes (Kgs.)	Organic Manure (Tonnes)	Total Chem. Fertilizes (Kgs.)
A.	**Marginal**				
1.	Paddy	7.29	184.00	10.25	116.00
2.	Ragi	6.00	55.00	10.00	40.00
3.	Tomato	7.00	103.00	10.00	83.00
4.	Sugarcane	7.00	533.00	11.00	325.00
5.	Banana	15.00	692.19	19.80	454.17
B.	**Small**				
1.	Paddy	7.75	186.00	12.25	136.00
2.	Ragi	6.50	57.90	12.00	45.00
3.	Tomato	7.50	103.00	11.00	83.00
4.	Sugarcane	8.00	595.00	13.00	430.00
5.	Banana	15.50	737.72	20.50	495.00
C.	**Medium**				
1.	Paddy	8.25	266.00	13.25	161.00

2.	Ragi	7.00	70.00	13.00	50.00
3.	Tomato	8.00	118.00	12.00	98.00
4.	Sugarcane	11.00	655.00	16.00	470.00
5.	Banana	16.50	790.00	21.00	553.10
D.	**Large**				
1.	Paddy	9.25	303.00	15.34	191.00
2.	Ragi	8.00	75.00	14.00	55.00
3.	Tomato	10.00	129.00	13.00	107.00
4.	Sugarcane	12.00	685.00	18.00	535.00
5.	Banana	17.00	828.40	21.40	640.20
E	**Average**				
1.	Paddy	8.14	234.75	12.77	151.00
2.	Ragi	6.87	64.47	12.25	47.50
3.	Tomato	8.13	113.25	11.50	92.75
4.	Sugarcane	9.50	617.00	14.50	440.00
5.	Banana	16.00	762.10	20.67	535.62

Source:Primary Data

The Tables 2 and 3 indicate that the difference in the application of organic manure between old and the new irrigated areas. The highest difference is observed for ragi followed by banana, sugarcane, paddy and tomato. The standard deviation values shows that the highest variance in the organic manure is for ragi crop and it is observed in the new irrigated area Davanagere district with value of 4.39 and 1.03 for old irrigated area i.e., Mandya district. There is a big difference in the usage of organic manure because the variance for ragi crop between old and the new irrigated area and its variance in organic manure is more than four times in the old irrigated area compared to the new irrigated area, i.e., Davanagere district.

Table-2: Mean Difference in the Application of Organic Manure Between the Old and New irrigated Areas - Across Various Crops.

Name of Crops	Districts	N	Mean	Std. Deviation	Std. Error Mean
Paddy	Mandya	181	7.9564	.53796	.03999
	Davanagere	120	12.3898	1.29070	.11782
Ragi	Mandya	83	7.0207	1.03660	.11378
	Davanagere	42	12.6186	4.39789	.67861
Tomato	Mandya	81	8.2408	.96207	.10690
	Davanagere	24	11.5833	1.10007	.22455
Sugarcane	Mandya	147	8.8163	1.85436	.15294
	Davanagere	94	13.7979	2.26036	.23314
Banana	Mandya	46	15.5761	.64951	.09576
	Davanagere	17	20.7894	.63873	.15492

The result of the t-test reveals that there is a significant difference in the average organic manure application among the selected districts. It is observed that the absolute value and the estimated probability value is less than 1.00 per cent, hence there is a significant difference in the application of organic manure of all the selected crops between the districts. The test results showed a significant difference in the application of organic manure in the new irrigated area of Davanagere district. The results, therefore reveal, that the irrigation scheme has greater influence in the new area where farmers have been using more organic manure compared to the old irrigated area i.e., Mandya district. Hence, it can be concluded that the proposed null hypothesis (H0) is rejected and alternate hypothesis (H1) is accepted. Organic manure is very essential to sustain the soil fertility and increase the yield (Bajwa, 2003). Therefore, the farmers in the new irrigated area used organic manure compared to the farmers in Mandya district.

Table-3: The Level of Significance in the Application of Organic Manure in the Old and the New Irrigated Area.

Name of Crops	Levene's Test for Equality of Variances	t-test for Equality of Means					

	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Paddy	42.936	.000	-41.159	299	.000	-4.43348	.10772
Ragi	112.518	.000	-11.045	123	.000	-5.59785	.50682
Tomato	2.403	.124	-14.461	103	.000	-3.34251	.23114
Sugarcane	5.649	.018	-18.655	239	.000	-4.98155	.26704
Banana	.011	.917	-28.402	61	.000	-5.21332	.18356

The second hypothesis tested in this paper is 'there is no difference in the usage of chemical fertilizers between the old and new irrigated areas'. The tables 4 and 5 reveal that there is a difference in the chemical fertilizers used between the old and new irrigated areas for all the crops in the study areas. The Table-4 contains that the mean values in Mandya district have been high for all the selected crops when compared to the new irrigated area, i.e., Davanagere district.

Table-4: Mean Difference in the Application of Chemical Fertilizers Between the Old And New irrigated Areas - Across Various Crops.

Name of Crops	Districts	N	Mean	Std. Error Mean
Paddy	Mandya	181	221.3536	3.34723
	Davanagere	120	143.5000	1.84766
Ragi	Mandya	83	67.0961	1.13351
	Davanagere	42	48.4524	2.60740
Tomato	Mandya	81	116.2346	1.02096
	Davanagere	24	93.3750	2.10573
Sugarcane	Mandya	147	598.4286	4.44467
	Davanagere	94	424.7340	6.61356
Banana	Mandya	46	736.2908	6.41231
	Davanagere	17	547.5902	22.25934

The table-5 reveals that the extent of the difference in the application of chemical fertilizers between the old and the new irrigated areas viz., Mandya and the Davanagere districts respectively.   The same table shows that in case of the crops like Banana and sugarcane the mean value difference in the application of chemical fertilizers in Mandya district is to the extent of 188.70056 and 173.69453 respectively. In case of one of the other major crops paddy it is 77.85359. As expected, in case of the food grain crop like ragi, the difference in the mean value between the old and the new irrigated areas it is only 18.64376. This indicates that in case of ragi the application of chemical fertilizers though it is high in Mandya but the difference is lower compared to the other crops. In the next section of the same paper reveals that this difference has serious implications on the productivity of all the crops in both the study areas.

Table-5: Result of Hypothesis of Chemical Fertilizers Difference for Selected Crops

Name of Crops	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	
Paddy	322.545	.000	17.778	299	.000	77.85359	4.37925	
Ragi	22.893	.000	7.635	123	.000	18.64376	2.44177	
Tomato	3.612	.060	10.406	103	.000	22.85957	2.19671	
Sugarcane	.724	.396	22.643	239	.000	173.69453	7.67095	
Banana	4.616	.036	11.073	61	.000	188.70056	17.04114	

The result of the t-test given in the same table-5 reveals that there is a significant difference in the average chemical fertilizers applied among the farmers in the selected districts, which have been observed by the absolute value - the estimated probability value is less than 1.00 per cent. Hence there is a significant difference in the application of chemical fertilizers of all the selected crops in the districts. The test results showed a significant difference in increased chemical fertilizers in the old irrigated area of Mandya district. The results therefore reveal that the chemical fertilizers are used more in the old irrigated area. Because of this the experts say that automatically the soil fertility gets declined and this will lead to decline in the productivity in the old irrigated area i.e., Mandya district. Therefore, it is concluded that the proposed null hypothesis (H0) is rejected and alternate hypothesis viz., `There is a difference in mean chemical fertilizers level between old and new irrigated areas' is accepted.

Employment Generation under Crop Cultivation in the New and Old Irrigated Areas:

In the agricultural crop cultivation the operations like preparation of land, sowing, application of manure, chemical fertilizers, and pesticides, weeding/intercultural activities, cutting, loading, plant protection, irrigation, harvesting, threshing, etc., are involved. Generally, the marginal and small categories of farmers use more family labour in agricultural activities as compared to the medium and large farmers (Gopalappa - 2000). In case of the medium and large farmers agricultural investment is more and also they use more of hired labour because of the land size and diversification of crops. There is a positive relationship between the farm size and usage of labour in both the districts.

Table-6 presents that the aggregate manual labour generation across various crops and different farm size classes in both the study areas. The table clearly reveals that in case of the crop sugarcane, the employment generation is high compared to all the other agricultural crops in both the study areas. This is followed by the crop Banana where the employment is more (second place) by putting the three crops behind. All the other three crops are low in terms of employment generation with minor differences.

The aggregate results show that in the old irrigated area i.e., in Mandya district, the employment generation is low compared to the new area i.e., Davanagere District. In case of the employment generation there is a positive relationship between the size class and the employment generation across various land size classes. This means, as the land size class increases, the employment generation also increases and vice-versa. The same tale reveals that the employment generation has been more for the farmers who are cultivating crops in Davanagere district for all the crops and for all the categories of farmers.

Table -:6 Per Acre Employment Generation Across Crops in Both the Study Areas (Per Acre/Per Crop).

Sl. No.	Crops Cultivated	Total Manual Labour (Mandya)	Total Manual Labour (Davanagere)
A.	**Marginal**		
01	Paddy	39.25	48.75
02	Ragi	39.50	47.87
03	Tomato	51.00	62.00
04	Sugarcane	98.05	107.00
05	Banana	47.23	57.92
B.	**Small**		
01	Paddy	42.25	48.75
02	Ragi	42.30	49.00
03	Tomato	52.57	66.50
04	Sugarcane	105.27	117.57
05	Banana	55.23	66.71

Sl. No.	Crops	Mandya	Davanagere
C.	**Medium**		
01	Paddy	49.00	55.75
02	Ragi	47.00	56.50
03	Tomato	61.43	74.05
04	Sugarcane	115.45	133.05
05	Banana	66.78	78.70
D.	**Large**		
01	Paddy	46.06	60.84
02	Ragi	44.70	60.00
03	Tomato	57.87	77.90
04	Sugarcane	111.21	137.01
05	Banana	61.75	79.85

The Tables 7 and 8 indicate that the difference in the generation of employment between the old and new irrigated areas. The highest difference is observed for the crops like, banana, sugarcane, tomato, paddy and ragi in the order of the extent of employment generation. There is a big difference in the employment generation in case of the banana crop followed by sugarcane crop. However, the employment levels has been high in case of the crop sugarcane, this is mainly because of the harvesting of sugarcane consumes more labour.

Table -7: Mean Difference in the Employment Generation Between the Old And New irrigated Areas - Across Various Crops.

Name of Crops	Districts	N	Mean	Std. Error Mean
Paddy	Mandya	181	44.9933	.33146
	Davanagere	120	52.7815	.30419
Ragi	Mandya	83	46.0076	.69529
	Davanagere	42	52.0005	2.60014
Tomato	Mandya	81	59.9520	.58290
	Davanagere	24	70.6146	1.29549
Sugarcane	Mandya	147	107.3795	1.10137
	Davanagere	94	121.2677	1.63899
Banana	Mandya	46	55.9050	1.40504
	Davanagere	17	72.5494	2.18037

The same hypothesis has been tested by using independent sample `t' test. The result of the t-test reveals that there is a significant difference in the average employment generation among the selected districts. It is observed that the absolute value and the estimated probability value is less than 1.00 per cent, hence there is a significant difference in the employment generation of all the selected crops between the districts. The test results showed a significant difference in the employment generation in the new irrigated area of Davanagere district. The results therefore reveal that the irrigation scheme has greater influence in the new area where farmers have been getting more employment compared to the old irrigated area i.e., Mandya district. Hence, the null hypothesis `There is no difference in mean manual labour employment level between the old and the new irrigated areas gets defeated and the alternate hypothesis `there is a difference in mean manual labour employment level between the old and the new irrigated area' has been accepted.

Table-8: Result of Hypothesis of Manual Labour Difference for Selected Crops

Name of Crops	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Paddy	30.294	.000	-16.341	299	.000	-7.78815	.47659
Ragi	29.412	.000	-2.872	123	.005	-5.99289	2.08641

Tomato	4.561	.035	-8.325	103	.000	-10.66254	1.28077
Sugarcane	4.927	.027	-7.306	239	.000	-13.88820	1.90093
Banana	.532	.469	-6.244	61	.000	-16.64441	2.66547

Area, Production and Yield for Seasonal Crops:
In the paper entire exercise is done to understand the production/productivity differentials in the 'Old and 'New' irrigated areas basically to learn the lessions to avoid the loopholes in providing irrigation facilities extent of input application and the labour use in the process of cultivating various crops. The table-9 presents the average area, production and yield for seasonal crops like paddy, ragi and tomato under both the irrigated regions. The table clearly reveals that in the new irrigated region, Davanagere is having more area cultivated compared to old irrigated region in Mandya district. Interestingly the average area under paddy crop is the highest in both the study areas constituting 4.36 acres. When irrigated land is considered, the paddy is dominating in terms of area compared to other crops. One of the most important food crop like, ragi is being cultivated under rainfed conditions, but also in irrigated region the tube-wells facility is used and crop ragi is cultivated. Any way the same table clearly reveals that for all the crops the production and productivity has been high in case of the new area i.e., Davanagere compared to the old irrigated area Mandya. This reveals that in Mandya district due to over dosage of chemical fertilizers over a period of time the lands have become saline lands and therefore, the productivity is less.

Table -:9 Average Area, Production And Yield Under the Food Crops (Per Acre/Per Crop).

Districts & Size Classes	Paddy			Ragi			Tomato		
	Area	Produc tion	Yield	Area	Produc tion	Yield	Area	Produc tion	Yield
Mandya									
Marginal	1.89	32.90	17.41	0.80	5.85	7.31	0.66	54.14	82.03
Small	3.77	68.58	18.20	1.51	12.67	8.40	1.72	143.47	83.41
Medium	5.38	101.98	18.95	2.08	17.53	8.43	1.77	148.74	84.03
Large	6.00	123.74	20.62	2.76	25.24	9.14	2.60	227.53	87.51
Total Average	**4.26**	**81.80**	**19.20**	**1.78**	**15.32**	**8.61**	**1.68**	**143.47**	**85.40**
Davanagere									
Marginal	2.00	45.23	22.61	0.63	5.25	8.33	0.73	67.80	92.87
Small	4.18	101.91	24.38	1.55	15.00	9.67	1.72	161.83	94.08
Medium	5.42	136.24	25.14	2.58	26.62	10.32	2.21	238.71	108.01
Large	6.25	163.29	26.13	3.00	32.13	10.71	2.30	253.30	110.13
Total Average	**4.46**	**111.67**	**25.04**	**1.94**	**19.75**	**10.18**	**1.74**	**180.41**	**103.68**
Both the Districts Average	**4.36**	**96.73**	**22.18**	**1.86**	**17.53**	**9.42**	**1.71**	**161.94**	**94.70**

Note: Area in Acres, Production and Yield in Qtls.

Table-10 presents the average area, production and yield for annual crops sugarcane and banana in both the districts. Even in case of the most important commercial crops like sugarcane and banana the average area cultivated in Davanagere district has been little higher compared to the Mandya district indicating that the land fragmentation in Mandya district has been more compared to the Davanagere

district. When it comes to the production and yield, they are more in Davanagere district compared to the Mandya district. For example in Davanagere district the average production per crop/acre has been 57.79 tonnes, whereas in Mandya district it is 50.34 tonnes. This is lower than the average production in both the study areas as it is 54.27 tonnes per acre. Even in case of the crop banana, same trends are noticed. In case of Banana crop the average production in both the study areas is 124.79 Quintals and the Davanagere district it is more that the average constituting about 132.43 quintals and where as in Mandya it is 117.10 Quintals per acre and per crop. Therefore, it can be concluded that in the new area the production has been high in case of both the food grain crops and commercial crops when compared to the old area i.e., Mandya district.

Table-10: Average Yield of the Commercial Crops in the Study Areas (Per Acre/Crop).

Districts & Size Classes	Sugarcane (Tonnes)			Banana (Qtl.)		
	Area (Acres)	Produc tion	Yield	Area (Acres)	Produc tion	Yield
Mandya						
Marginal	1.22	56.81	46.56	0.79	88.75	112.34
Small	1.81	86.31	47.68	1.66	192.60	115.02
Medium	2.04	106.70	52.30	2.38	278.13	116.86
Large	2.33	122.69	52.66	2.80	335.20	119.71
Total Average	**1.85**	**93.13**	**50.34**	**1.91**	**223.67**	**117.10**
Davanagere						
Marginal	1.24	61.08	49.26	0.75	89.33	119.11
Small	1.63	83.36	51.14	0.81	99.00	122.22
Medium	1.83	112.52	61.48	2.50	324.00	129.60
Large	3.00	186.88	62.30	3.00	420.00	129.60
Total Average	**1.92**	**110.96**	**57.79**	**1.76**	**233.08**	**132.43**
Average Two Districts	**1.88**	**102.04**	**54.27**	**1.83**	**228.37**	**124.79**

To test the Hypothesis that there is no difference in the mean productivity level between the old and new irrigated areas we have used the primary data and worked out the independent sample `t' test. The Tables-11 and 12 contain the results and these results clearly reveal that the mean productivity difference is observed for all the given crops in the study area. The results indicate that the productivity has been high in Davanagere district (new irrigated area) compared to the Mandya district as the mean differences are very much noticed between the two districts.

Table-11: Mean Difference in the Productivity Levels of Various Crops.

Name of Crops	Districts	N	Mean	Std. Error Mean
Paddy	Mandya	181	18.8155	.13479
	Davanagere	120	24.4373	.12567
Ragi	Mandya	83	8.4628	.07265
	Davanagere	42	10.0440	.17685
Tomato	Mandya	81	84.8075	1.65109
	Davanagere	24	101.0321	2.80911
Sugarcane	Mandya	147	50.2133	.62449
	Davanagere	94	55.3533	.95702
Banana	Mandya	46	117.2824	2.09462
	Davanagere	17	129.5100	2.50997

The table-12 indicates that there is a significant difference in the average productivity levels among the selected districts, which have been observed by the absolute value and the estimated probability value is less than 1.00 per cent, hence there is significant difference in the productivity levels of the selected crops like., paddy, ragi, tomato, sugarcane and banana crops between the districts. Therefore, the Null Hypothesis that there is no difference in the mean

productivity level between the old and new irrigated areas has been rejected and the alternate hypothesis is accepted i.e., there is a difference in mean productivity level between the old and new irrigated areas has been accepted.

Table-12: T-Test Results of the Mean Difference in the Productivity of Various Crops in the Study Areas.

Name of Crops	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Paddy	11.148	.001	-28.881	299	.000	-5.62173	.19465
Ragi	10.150	.002	-9.774	123	.000	-1.58128	.16178
Tomato	1.101	.297	-4.774	103	.000	-16.22455	3.39819
Sugarcane	8.434	.004	-4.702	239	.000	-5.13996	1.09320
Banana	.251	.618	-3.238	61	.002	-12.22761	3.77594

CONCLUSION:

From the last so many decades the rural population is migrating to urban areas, the main reason is that from the agricultural sector sufficient income is not being generated and also there is unemployment and disguised unemployment in the rural areas. The employment generation is lower during the later part of winter season and in the entire summer season. One important concern or question is how to generate employment in the rural areas during all the three seasons. As an answer to this question the development agencies started providing the irrigation facilities to solve the problems of the farmers but the farmers are not able to take care of the issues which they are supposed to take care to cultivate the crop throughout the year and increase the production. Towards this, Mandya district is an example, where irrigation facilities are given since from so many decades. The farmers in this area have been cultivating different food and commercial crops like paddy, ragi, tomato, sugarcane banana, etc. With this it is highly possible to increase the production and productivity. However, compared to the new irrigated area (Davanagere) in Mandya district the production and productivity is much lower due to over dosage of fertilizers and pesticides. Hence the development agencies like the government and agricultural universities need to create more awareness regarding the proper dosage of fertilizers so that the production and productivity will be more.

REFERENCES:

1. Bajwa, M. S. (2003). Organic farming: A high value enterprise. The Tribune, March 17, Agriculture Tribune, Chandigarh
2. Clark C., (1957). "Conditions of Economic Progress", Macmillan, London
3. Chadha, G. K. and P. P. Sahu (2004). "Recent Changes in Agricultural Employment in Rural India: A State-Level Analysis", Agriculture Situation in India 61 (8):249-271.
4. Gopalappa D.V. (2000). Small Farms and Sericulture- A Case Study of Rayalaseema in Andhra Prasesh, Banagalore University, Bangaluru.
5. Gulat, Ashok and Banerjee, P. (2015). Rationalizing Fertiliser subsidy in India: Key issues and Policy Options: Indian Council for Research on International Economic Relation (ICRIER) Working Paper No.307, New Delhi.
6. Sidhu, R. S. and Sukhpal Singh (2004). "Agricultural Wages and Employment in Punjab," Economic and Political Weekly, Vol. 39, (September 11): 4132-4135.
7. World Bank (2010). Perspectives on Poverty in India: Stylized Facts from Survey Data, World Bank report, Washington DC.