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A Study on Livelihood Status of Dry Land Farmers in Mecheri Block of Salem District

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ABSTRACT

Dryland farming and dry land agriculture are often use synonymously. However, the raising of livestock on native vegetation can be considered dryland agriculture. In contrast, dry land farming requires conversion of a natural ecosystem to an agro ecosystem, usually by tillage, and then growing introduced crops. The main objective of this study was to analysis area, production and productivity of dryland crops in the Mecheri block. This study intends to use a secondary source of information. The secondary data had been used for the study purpose. The data was referred for in various issues of SHB from 2000-01 to 2017-2018. In the overall performance of growth in the area, production and productivity of dry land crops mecheri block were observed that the area under cereals Cholam, Cumbu, Ragi and pulses Cowpeas, Horse gram, Green gram, Black gram, Field beans and Yellow lentil and Oilseeds in Groundnut and Gingili increased production and productivity same increased. Over the period of time at reference (2000-01 to 207-18).

1. Introduction

Rainfed agriculture was the type of agriculture that solely depends on rainwater for irrigation at any crop stage. Rainfed agriculture was synonymous with non irrigated agriculture. The term is rainfed to a wide range of patterns from arid to humid conditions. This type of agriculture was also called dryland farming or dryland agriculture. These two terms are often used interchangeably, though there were some distinctions. In general, rain-fed agriculture was divided into two main categories namely. Rainfed wetland and rainfed dry land. Rainfed wetland farming refers to conditions where rain fell was adequate and relatively well distributed during the crop season and drainage of excess water was a major concern. on the contrary. dry land farming refers to farming under conditions where rainfall was low, erratic and was concentrated within a short period during the year.

Agriculture was the single largest livelihood source in India with nearly two-thirds of people depend on it. Rainfed agriculture was as old as agriculture itself. Growing of crop entirely under rainfed conditions was known as dryland agriculture. In another word. dry farming or dryland farming may be defined as a'' practice of growing profitable crops without irrigation in areas which receive an annual rainfall of millimeter or even less''.

2. Types of Rainfed Areas

Depending on the amount of rainfall received, dry land agriculture was categorized into four groups;

Arid Zone; These types of the area have less than 400 millimeters of annual rainfall with less than 75 days of crop growing period. These areas can accommodate only the seasonal grazing of livestock. The cultivation of short duration crops was possible only with irrigation.

Semi-Arid Zone; This zone receives 400 to1000 millimeters of annual rainfall and was further divided into two sub-zones, sub I receive annual rainfall between 400to 700 millimeters with 75 to 120 days of crop growing period. Both dryland crops and livestock were supported in the areas

Sub-Zone: Receives annual rainfall between 700 to 1000 millimeters with 120-140 days of crop growing period. These areas were suitable for crop production. strategy in these areas was to make the best use of limited water supply by conserving it in-situ or the adoption of crop production technologies giving higher water use efficiency.

Semi-Wetland Zone; this receives an annual rainfall of 1000 to 2000 millimeter distributed over a Period of 4 to 7 months with a crop growth period of 140 days. Rice and other major food crops were easily in these areas. Long duration crops/varieties and multiple cropping have adopted this zone

Wet Zone; This receives more than 2000 millimeters of mean annual well-distributed rainfall over a period of 7 to 10 months more than 200 days crop growing period In this zone, perennial tropical plantation crops such as oil palm, coconut, rubber,cocoa.coffee.ete.was predominant besides multiple cropping of Rice and other tropical crops.

3. Dryland Farming in Tamil Nadu

The geographical area of Tamil Nadu was 19 million hectares of which the cultivable area was 10 million hectares and within the area, dryland farming was practiced in 7.8 million hectares. In Tamil Nadu, the area under dryland constitutes millets Cholam Cumbu, Ragi.

4. Review of literature

Leubs and Leag (1964) observed that dry land farming was generally characterized as a crop production in areas where lack of moisture was the major limiting factor. Non

irrigated arable lands receiving an average of 8 to 20 inches of precipitation were considered to be dry farmed.

Chinnamani (1971) revealed that a farmer can improve his crop yield by adopting modern agricultural techniques as under cultivation of high yielding varieties with proper seed rate, application of optimum fertilizers and adoption of rigid plant production measures. Moisture conservation measured by contour cultivation adopting soil and water conservation measures and other proper bunds, strip cropping, crop rotation, multiple cropping and best use of available water. The study also revealed that for maximum returns per unit area, per unit time, the farmer used his land according to its capability.

Rastogi et al (1980) analyzed the existence of large gaps between yield level obtained at research farms in demonstration farms and in farmers fields. It was clear from their result that unlike the average yields in demonstrations and research stations the yields at farmer's fields for most of the crops was not only depressingly low but also vary within the narrow limits of the different locations. They suggested to change from traditionally low investment level technology to newly developed high investment level technology as a step to boost crop yields.

Pratap (1998) analysed the demand for commercial energy based inputs like fertilizers and diesel which would increase the shift in cropping pattern from Coarse Cerals or Commercial crops. Farmers in pursuit of profit maximization take decisions considering productivity levels and input output prices. Current input prices favour the use of commercial energy as crucial input in crop production in India any reduction in commercial energy use in agriculture may adversely affect crop productivity and production.

Breese et al (2002) examined the cultivating pattern of Coarse Cereals viz., sorghum, pearl Millet and Finger Millet in India. They found assuming significance of cropping pattern of dry land regions was mainly due to the fact that as they require little inputs and was more drought resistant compared to other competing crops.

Maharjan et al (2003) tried to measure the profitability of growing various crops in the Northern Dry Zone of Karnataka. The study area was charactererized by low and income rainfall, poor fertility status of the soil frequent drought and high fluctuation in the yield of the crops. So the profitability in crop production was also highly volatile.

Ramakrishan and TataRao (2008) presented a paper elucidated the performance of Indian agriculture for this purpose they used all India area. Production and yield of food grains from 1950 – 51 to 2003 - 04 along with percentage coverage under irrigation. They also mentioned that what are the factors Constraints in dry land agriculture like physical constraints, technological constraints and socio economic constraints. They also pointed out the dry land farming techniques in India and lastly impact of policy on dry land farming.

Venkateswarlu and Prasad (2012) examined the sustainable agriculture was possible only with a steady population. As India was marching ahead to be the most populous nation by 2050. There should be more productive approach for sensitization on population control and stabilization. However technological developments and various development programmers have substantial impact on productivity enhancement. In order to further enhance the productivity, we need to pay attention to soil health prudent management of water resources, strategic application of improved production technologies and above all innovations in technology transfer and up scaling by leveraging the ongoing development schemes.

Ningaraju and Arundas (2017) this study evaluated the limited resources of land and water in hand, their optimum use is a must to for increased production of food grains to the demands of increasing population. The productivity in any area can be substantially raised by growing the crops suitable to the area with the help of newly developed agricultural techniques. Rain fed crops would continue to dominate in the agriculture of Mysore district.

Scope of the study

By 2025 human population in dry land regions in India was likely to reach 800 million from the present level of 410 million. The present level of productivity dry land crops was 0.8 to 1.0 tons per hectares, which was to be increased to 1.0 to 2.0 tons per hectares by 2025. Furthermore the quality of produce must improve to meet the world market standards. In addition the cost of production needs to be reduced not only to improve farmer's meet income but also to remain globally competitive. In view of escalating costs of inputs and prevailing low procurement prices for the dry land agricultural commodities. The study was confined to the investigation of the dry land agriculture. Hence the nature of relationship between the dependent and the selected independent variable for dry land agriculture area shall contribute to the development of livelihood security. It was expected that the findings of the study would be useful to the planners and administrators in formulating suitable modification for dry land development. The dry land farmer's livestock rearing was an alternative and support for maximizing their family income. Keeping all those factors in consideration the following objectives was formulated for the study.

5. Objectives

- To examine the growth in area, production and yield of dry land crops in mecheri block.

6. Methodology

This study intends to use secondary source of information. The secondary data had been used for the study purpose only the reason to select Dry land farmers in crop and Mecheri block was that in Salem district this crop and Block were well known for the quality of dry land crop and yielding capacity. Dry land farmers in crops as well as within Tamil Nadu and Mecheri block more area under cultivation was the growth in area, production and yield of dry land crop. In were also contributing to the districts economy as well as serve as served to be a source of official records and web

sources such as Hand Book of Statistics on the Indian Economy, Office of the Assistant Director of Statistics, Department of Agriculture and Statistics Union Office Mecheri block, have been referred for the collection of data from 2000-01 to 2017 – 2018.

The result of growth estimation of total area, production and productivity of dry land crops in Mecheri block during reference period was discussed below. In order to identify the significant role and the economic status of dry land crops in the Mecheri block.

7. Results and Discussions

Table 1: Area of Dry Land Crops in Mecheri block during 2000-01 to 2017-18.
(Acres)

Year	Cereals			Pulses						Oilseeds	
	Cumbu	Ragi	Cholam	Cow peas	Field Beans	Black gram	Green gram	Horse gram	Yellow lentil	Gingili	Groundnut
2001	217	2018	901	885	472	630	732	801	211	518	458
2002	168	1665	889	873	423	596	552	612	158	483	421
2003	152	1157	300	837	407	560	1420	689	182	200	814
2004	169	3105	1389	853	289	459	953	750	139	480	536
2005	350	2205	3725	760	605	525	1020	843	450	370	375
2006	617	3339	1697	693	872	391	508	897	517	965	399
2007	347	3013	2106	733	902	493	517	915	247	983	437
2008	238	2878	2312	857	793	458	436	690	338	1007	675
2009	154	2234	2599	976	809	441	393	767	254	1199	865
2010	293	2596	2397	452	648	597	497	983	393	1253	563
2011	168	2616	1987	515	855	615	545	1042	278	1340	702
2012	203	2884	2013	600	910	603	600	920	413	1226	693
2013	182	2415	2128	587	935	688	682	986	337	1333	755
2014	210	3043	2165	665	893	718	633	1010	489	1412	807
2015	190	3217	2290	712	616	780	754	1075	513	1406	865
2016	227	3529	2387	800	917	675	811	1230	450	1535	912
2017	235	3686	2460	793	983	812	925	1167	575	1589	978
2018	244	3922	2695	845	1023	928	889	1241	610	1627	1014

Source: *Various Issues of Agriculture Statistical Handbook of Union Office Mecheri block.*

Examine the area under cultivation of dry land crops in mecheri block during 2000-01 to 2017-18. The three major cereals and pulses crops cultivated in this block were Cholam, Cumbu, Ragi, Black gram, Green gram, Horse gram, Cow peas, Field beans, Yellow lentil and Oilseeds crops like Groundnut, Gingili was grown among the cereals crops are under Ragi was observed to be cultivated in more acres compared to that of Cholam and Cumbu during the period of reference. Area under cultivation of Ragi was 2018 acres during 2000-01 it was increased to 3922 acres. During the study period the area under Ragi cultivation was more than 3000 acres during 2003-04, 2005-06, 2006-07, 2013-14, 2015-16, and 2017-18. Cholam cultivation was carried out in 901 acres during 2000-01 and it was declined till 2002-03 with only 300 acres. During 2004-03 with only 300 acres. During 2004-05 Cholam cultivation increased to 2695 acres of area and it was observed to be more than 3000 acres in the year 2004-05 Cumbu on the other hand increased marginally from 217 acres to 244 acres during the year 2000-01 to 2017-18.

Pulses were another major crop which was cultivated in large acres among the dry land farmers. Cow peas, Horse gram, Green gram, Black gram, Field beans and Yellow lentil variety of pulses were grown in this block pulses place a dominate role in the food bashed of Indian cuisine. Therefore cultivation of pulses was carried out in many parts of India. The area under cowpeas cultivation of pulses was carried out in many parts of India. The area under cowpeas cultivation in mecheri block was 885 acres during 2000-01 and it declined to 845 acres in 2017-18. During the reference period the area under cowpeas cultivation was lowest with 452 acres during 2009 -10. Area under Horse gram cultivation was maximum with 1241 acres during 2017-18 and minimum 612 acres in their 2001-02 of the reference period. From2000-01 to 2017-18 the area under Horse gram cultivation was range between 612 and 1010. Area under Green gram cultivation was maximum with 1420 acres during 2002-03 and minimum in the year 2017-18 of the reference period. From 2000-01 to 2017-18 the area under Green gram cultivation range between 393 and 1020. Area under Black gram cultivation was maximum with 928 acres during 2017-18 and minimum in the year 2017-18 the area under Black gram cultivation was range between 391 and 812. Area under Field beans cultivation was maximum with 1023 acres during 2017-18 and minimum in the year 2017-18 of the reference period from 2000-01 to 2017-18 the area under Field beans cultivation was range between 289 and 983.there was nearly 75 per cent increased in the area under cultivation of Yellow lentil in

mecheri block. During 2000-01it was 211 acres and it was increased to 610 acres. Only during 2017 -18 the area under this crop was found to be lowest with 139 acres overall the pulses cultivation in this block witnessed increased.

The major Oilseeds cultivated in this block were observed to be Groundnut and Gingili for the acres period of reference. It was observed that there acres significant increase in area under cultivation of Groundnut and Gingili. Over the study period in this block in the year 2000-01 the acres under Groundnut was 458 acres and it was increased to 1014 acres with some ups and downs in the intervening years. During 2002-03 and 2017-18 the area under Groundnut cultivation was observed to be more than 800 acres. In the case of Gingili the area under cultivation increased more than 75 per cent from 518 acres during 2000-01 to 1627 acres in 2017-18. During the study period the area under Gingili showed declined trend espessionly from 2001-02 to 2004-03. There after records an increasing trend for the rest of the period oilseeds area under cultivation witnessed an increased trend compare to that of cereals and pulses crop.

Table 2: Production of Dry Land Crops in Mecheri block during 2000-01 to 2017-18.

(Kilograms)

Year	Cereals			Pulses						Oilseeds	
	Cumbu	Ragi	Cholam	Cow peas	Field Beans	Black gram	Green gram	Horse gram	Yellow lentil	Gingili	Groundnut
2001	44702	4927956	277508	86730	31152	602280	176412	253116	29540	434602	472656
2002	30576	2479185	264922	83808	27072	465476	70656	231336	21488	259854	298910
2003	17936	1684592	32100	73656	22792	454720	548120	172250	43316	85200	1276352
2004	61516	5691465	633384	71652	15028	273564	299242	300000	25854	390240	566016
2005	37450	3450825	2801200	56240	36300	449925	359040	290835	141750	167240	168000
2006	159186	4046868	527767	37422	59296	269790	88392	356109	193875	1487065	268128
2007	92302	4266408	1090908	61572	64944	346086	93577	420900	59280	1518735	505172
2008	51646	5442298	1491240	71131	64233	385636	54936	351900	104780	1571927	831600
2009	31570	2922072	1850488	91744	69574	395136	58164	410345	72644	1884828	1277605
2010	63581	3078856	1804941	25312	59616	564165	68586	590783	77814	2018583	651391
2011	35616	3170592	3288485	33990	83790	621150	82840	549134	58380	2240480	830466
2012	44660	3711708	3426126	43200	92820	595161	8400	593400	104489	1970182	841995
2013	37310	3274740	4034688	46960	74800	710704	112530	574838	105144	2283429	1001130
2014	41580	4299759	5135380	63175	69654	757490	112674	684780	127140	2393340	1130607
2015	39330	4407290	6668480	61232	58520	875940	139490	765400	193914	2550484	1105470
2016	47670	4414779	8433271	62400	105455	808650	137870	806880	185400	2848960	1240320
2017	47470	5967634	9131520	76921	108130	1009316	177600	940602	304750	3047702	1528614
2018	50752	5973206	10594045	92950	116622	1198976	186690	1034994	351970	3213325	1640652

Source: *Various Issues of Agriculture Statistical Handbook of Union Office Mecheri block.*

Production of cereals Cholam, Cumbu, and Ragi Black gram, Green gram, Horse gram, Yellow lentil, Cowpeas, Field beans and Oilseed Groundnut and Gingili in mecheri block for the period of 2000-01 to 2017-18 was presented in table 2.2 during 2000-01 the production of cholam was 277508 kilograms in 2017-18. The table reveals that the production of cholam was maximum during 2004-05 2810200 kilograms. The production of cholam was recorded in seven digits for the year 2004-05, 2006-07 and 2017-2018. The production of cumbu over the period of time increased from 44702 kilograms during 2000-01 50752 in 2017-18. The production of cumbu was observed to be in five digits for the entire period of reference expects for 2003-04 and 2005-06 were the production was inlakhs. Production of Ragi was estimated to be 4927956 kilograms during 2000-01 and in the Consecutive two years the production has increased to 5691465 Kilograms during 2003-04 and it showed declined trend from 2004-05 onwards except 2007-08. Among the three cereals crops in the study the production of ragi was observed to be more compared to that of cholam and cumbu.

The area under cultivation of pulses showed a declining tren in the case of all six pulses namely Cowpeas, Horse gram, Green gram, Black gram, Field beans and Yellow lentil. Among the six pulses production of cowpeas was found to be high compared to Horse gram and Green gram, Black gram, Field beans, and Yellow lentil production decreased from 86730 Kilograms during 2000-01 to 92950 Kilograms in 2017-018. The decreased in the cowpeas production was continuous throughout the period of reference. The production of Horse gram declined more than 75 per cent from 253116 kilograms in 2017-18. Production of Green gram was recorded as 176412 kilograms in the year 2000-01and it was increased to 186690 kilograms during 2017-18. The production of Black gram was recorded as 602280 kilograms in the year 2000-01 and it was increased to 1198976 kilograms during 2017-18. The production of Field beans was recorded as 31152 Kilograms in the year 2000-01 and it was increased to 116622 Kilograms during 2017-18. The production of Yellow lentil was recorded as 29540 kilograms in the year 2000-01 and it was increased to 351970 kilograms

during 2017-18.the yellow lentil production was maximum during 2007-08 with 104780 kilograms in recorded . it was observed from the table that the production of Cow peas, Horse gram, Green gram, Black gram, Field beans, and Yellow lentil pulses selected for the study increased continuously throughout the period of reference with some fluctuation in the intervening years.

The two major edible tills taken for consumption and utilized by large population in that cookely in south India Groundnut and Gingili. Therefore marginal farmers cultivated thee crops for their demand under dry land conditions. It was observed from the table that the production of Groundnut was increased from 472656 kilograms during 2000-01 to 164065 kilograms in 2017-18. The Groundnut production was significantly rose to more than 12000 kilograms during 2002-03 and 2017-18 respectively in the case of Gingili the production increased nearly 5 times from 434602 kilograms during 2000-01 to 3213325 kilograms in the year 2017-18. It was noticed from the table that the production of Gingili declined after 2000-01 till 2004-05 and from 2005-06 onwards it was observed to be more than 1400000 kilograms. The increase in production of Gingili from 2005-06 onwards was due to more than brought under cultivation.

Table 3: Productivity of Dry Land Crops in Mecheri block during 2000-01 to 2017-18.

(Kilogram / Acres)

Year	Cereals			Pulses						Oilseeds	
	Cumbu	Ragi	Cholam	Cow peas	Field Beans	Black gram	Green gram	Horse gram	Yellow lentil	Gingili	Groundnut
2001	206	2442	308	98	66	956	241	316	140	839	1032
2002	182	1489	298	96	64	781	128	378	136	538	710
2003	118	1456	107	88	56	812	386	250	238	426	1568
2004	364	1833	456	84	52	596	314	400	186	813	1056
2005	107	1565	752	74	60	857	352	345	315	452	448
2006	258	1212	311	54	68	690	174	397	375	1541	672
2007	266	1416	518	84	72	702	181	460	240	1545	1156
2008	217	1891	645	83	81	842	126	510	310	1561	1232
2009	205	1308	712	94	86	896	148	535	286	1572	1477
2010	217	1186	753	56	92	945	138	601	198	1611	1157
2011	212	1212	1655	66	98	1010	152	527	210	1672	1183
2012	220	1287	1702	72	102	987	14	645	253	1607	1215
2013	205	1356	1896	80	80	1033	165	583	312	1713	1326
2014	198	1413	2372	95	78	1055	178	678	260	1695	1401
2015	207	1370	2912	86	95	1123	185	712	378	1814	1278
2016	210	1251	3533	78	115	1198	170	656	412	1856	1360
2017	202	1619	3712	97	110	1243	192	806	530	1918	1563
2018	208	1523	3931	110	114	1292	210	834	577	1975	1618

Source: *Various Issues of Agriculture Statistical Handbook of Union Office Mecheri block.*

Table.3 examinees the trend of yield in kilograms per cent acres of dry land crops in mecheri block. Yield of Cumbu and Ragi was observed to be decreased for the period of reference in the case of Cholam the yield was 308 kilograms per cent for the year 2000-01 and it was increased to 3931 kilograms per acre during 2017-18. There was marginal farmers increase in the yield of Cumbu from 206 kilograms per acre in 2000-01 to 208 kilograms per acre during 2017-18. The table reports that maximum yield of cumbu was found to be 364killograms per acre for the year 2003-04. In the case of Ragi the yield was significantly more than 1200 kilograms per acre during study period. Although during 2000-01 the yield per acre Ragi was 2442killograms per acre. It was declined to 1523 kilograms per acre in 2017-18.

Yield of Black gram in mecheri block was found to be less than 1000 kilograms per acre. From the table it was clear that the yield of Black gram was recorded to be 956 kilograms per acre during 2000-01. Which was marginal by declined to 945 kilograms acre during 2009-10. The yield of Black gram was more than 900 kilograms per acre only during 2000-01 and 2017-18 respectively. The yield Horse gram was increased from 316 kilograms per acre in 2000-01 to 834 kilograms per acre in 2017-18. During the year 2002-03 to 2003-04 the yield was recorded to be more than 3000 kilograms per acres. The yield of Green gram was decreased from 241 kilograms per acre in 2000-01 to 210 kilogram per acre in 2017-18. During the years 2002-03 to 2004-05, the yield was recorded to be more than 3000 kilograms per acre. The yield of Yellow lentil was increased from 140 kilograms per acre in 2000-01 to 577 kilograms per acre in 2017-18. During the 2002-03 to 2017-18 the yield was recorded to be more than 3000 kilograms per acre. The yield of Cowpeas was increased from 98 kilograms per acre in 2000-01 to 110 kilograms per acre in 2017-18. During the years 2002-03 to 2017-18 the yield was recorded to be more than 3000 kilograms per acres. Yield of Field beans pulses was the 200 kilograms per acre for the entire period of study in the year

2000-01 the yield of Field beans was 66 kilograms and the yield was observed to be increased to 114 kilograms per acre for 2017-18 for the years 2011-12 to 2015-16, 2016-2017 and 2017-18 the yield was 120 kilograms per acres.

During 2000-01 the yield of Groundnut was 1032killograms per acre but during the next years the yield was reduced by 710 kilograms per acre during the 2003-04 and 2017-18 there was significant increase in the yield of Groundnut. However the 2018 reported only 1618 kilograms per acre. In the case of Gingili crop of the yield for the first five year was 839 kilograms per acre 2000-01 to 452 kilograms per acre 2004-05. From 2005-06 and 2017-18 onwards the yield of gingili was observed to be more than 1500 kilograms per acre and increased at faster rate.

8. Conclusion

In overall performance of growth in area, production and productivity of dry land crops mecheri block was observed that the area under cereals Cholam, Cumbu, Ragi and pulses Cow peas, Horse gram, Green gram, Black gram, Field beans and Yellow lentil and Oilseeds in Groundnut and Gingili increased production and productivity same increased. Over the period of time at reference 2000-01 to 2017-18.

Reference

1. Breese W.A., Hash C.T., Deves K.M and Howarth C.G (2002) “Pearl Millet Genomies an Overview with Respect to Breeding for Resistance to Doeny Mildew, In: Leslie, J.F,(Ed)”,Sorghum and Millets Pathology, Lowa State University Press, Ames, Lowa, U.S.A., 2002, Pp 243- 246.
2. Chinnamani S., (1971) “Soil Conservation and Dry Farming in Telegne, Andhra Pradesh.” Indian Farming, Vol. 21, No.2, 1971, Pp. 28-31.
3. Leabs R.E and Leag A.E.,(1964) “ Tillage and Nitrogen for Dry land Grain in a Winter Rain Fall Climate California Agri. Expt” State Billion., May., 1964., Pp 805.
4. Maharjan. A., Hiremath G.K., and Patil B.I., (2003) “ Profitability of Growing Crops in Northeren Dry Zone of Karnataka” Agriculture Situation in India, February 2003, Vol. 11, No.11, 2003, Pp. 729-736.
5. Ningaraju Arun Das. S. (2017) “Cropping Pattern and Crop Ranking of Mysore District”, International Journal of Research – Granthaalayah, Vol. 5, No.4, 2017, Pp. 2394-3629.
6. Pratap S. Birthal. L.M. Pandey and Suresh Pal.,(1998) “ Energy Demand for Crop Production in Rain fed Areas”., Indian Journal of Agricultural Economics, July – September 1998 Vol. 53, No.3, Pp. 256-264.
7. Ramakrishna R., and Tata Rao D., (2008) “Strengthening Indian Agriculture through Dry land Farming Need for Reforms”, Indian Journal of Agriculture Economics, July – September 2008 Vol. 63, No.3, Pp. 460-476.
8. Rastogi B.K., Reddy Y.V. and Annamalai V. (1980) “Economic Dimensions of Dry Farming Technology”. A Decade of Dry land Agricultural Research in India. Indian Council of Agricultural Research Publication. All India Co-ordinate Research Project for Dry land Agriculture, Hyderabad 1971-80, Pp 181- 198.
9. Venkateswarlu and Prasad (2012) “Carrying capacity of Indian agriculture: issues related to rain fed agriculture”, Central Research Institute for Dry land Agriculture, Hyderabad, Vol. 102, No.6, 2012, Pp. 882-888.

