International Journal of Academic Research
ISSN: 2348-7666; Vol.3, Issue-11(1), November, 2016
Impact Factor: 4.535; Email: drtvramana@yahoo.co.in

An Economic Analysis of Coarse Cereals in Karnataka: A Macro Level Study

B. M. Kumara* and **S. Rajendran****
* Assistant Professor, Centre for Study of Social Exclusion and Inclusive Policy (CSSEIP), Library Building, Mangalore University, Mangalagangothri-574199, Mangalore, Karnataka,

** Professor of Economics, Department of Economics, The Gandhigram Rural Institute-Deemed University, Gandhigram – 624 302, Dindigul, Tamil Nadu,

Abstract: *Coarse cereals form an important role in the agriculture development of Karnataka. Suitable agro-climatic conditions and local consumption behaviour are responsible for groveling coarse cereals in the state. While jowar and bajra are grown largely in the Northern state ragi is mainly cultivated in the Southern part. Maize is evenly cultivated across the state. More than 40 percent of total cereal area is occupied by a hardful of districts in the northern part. Interestingly though the area is marginally declining, the production is increasing over the years. It leads to conclude that the productively is increasing. Despite some diseases and pests do occur on coarse cereals. Suitable measures are to be taken up for enhancing productivity in dry land regions. Various development and extension services require immediate attention. If these are done, the 'Rainbow Revolution' (Coarse cereal revolution) can be achieved soon.*

Keywords: *Agriculture, Agro-Climatic, Area and Production, Coarse Cereals*

I. Introduction:

Indian Agriculture has been witnessing tremendous progress since the launching of Green revolution packages during mid sixes. Especially the fine cereals like wheat and paddy have been showing spectacular performance in the states such as Punjab and Haryana. Due to assured irrigator, application of chemical inputs and setting up of research and development institutions appreciable performance was achieved. Nonetheless, the green revolution strategy brought out some undesirable issues like salinity water logging and stagnation of productivity have been reported. It has been alleged that green revolution helped improving the performance of fine cereals and hence this phase is called as 'cereal revolution'.

In the process, traditional butnutrient rich cereal crops popularly known as coarse cereals have been losing their significance (GOK, 2001). In fact the so called coarse cereals are nutrient rich and staple food for a large chunk of Indian population. This is very munch true for the states like Karnataka where the irrigation potential is restricted to only a couple of districts like Mandya and the present study intends to examine the main issues in the state of Karnataka

In this state, ragi is a common cereal is southern part and jowar is a popular cereal in northern part. Even today, where the public distribution system enables the supply of fine cereals, the offtake is less due to cultural and

consumption behaviour of the local population. Coarse cereals are considered as nutritions and provide enough fodder for livestock and in this state a significant portion of coarse cereals is consumed.

Table: I. Vitamin content of coarse cereals compared with fine cereals (per 100 grammes of edible portion)

Food Item	Vitamins				
	Thiamine (mg)	Riboflavia (mg)	Niacin (mg)	Folic Acid (Free) (/ fig)	Carotene (/flg)
Bajra	0.33	0.25	2.3	14.7	132
Jowar	0.37	0.13	3.1	14.0	47
Ragi	0.42	0.19	1.1	5.2	42
Rice	0.27	0.12	4.0	N.A	9
Wheat	0.45	0.17	5.5	142	64

Source: *C Gopalan and Other (2000), p. 59.* **Note** : *NA - data not available.*

The adverse implications of green revolution packages were realized even in this state (Karnataka). Despite the fact that area under assured irrigation is increasing application of synthetic inputs is common the productivity of fine cereals especially rice became stagnant (GOK, 1993) during eighties. However, this did not defer the yield performance of coarse cereals. Since the irrigation potential is limited here, coarse cereals which are ideal for dry lands, have been cultivated. But the real issue is that due to advent of science and technology in the area of agriculture many local coarse cereal varieties have extinct. In this context it is essential to take stock of the potential of these crops in terms of area and production. This paper makes an attempt to examine of growth of area since 1960. Similarly the growth performance of production has been dealt with. Based on the analysis some policy imperatives have been drama at the end.

II. Data source:

This paper completely relies on secondary data on area and production for coarse cereals across districts. Data have been collected from season and crop reports, agricultural senses, statistical abstracts and the like, primarily published by the government of Karnataka, related variables like minimum support price periodically announced by the government of India for coarse cereals and other crops has also been collected.

Relevant data have been garnered for about 40 years starting from 1960 till 2001. However analysis has been done by decades to understand the trend in area and production. In this state, recently many districts were either bifurcated / trifurcated for administrative convenience. But for the present exercise, they have been clubbed with their parental districts for comparative

analysis. Further no coarse cereal has been cultivated in Bangalore urban district and hence this district is excluded from the analysis and the remaining 19 districts have been taken into account.

Based on the available data, district-wise share of individual cereals (area) has been worked out. Simple growth rates have also been worked out across districts for all major coarse cereals. Districts have been classified based on the growth performance and analysis has been done. This paper has been divided into five broad headings. Briefly the major issues on coarse cereals and the need for the study have been discussed in the introduction. Data sources and methodology have been explained in the section two. Past three takes a look at the relative performance of area under coarse cereals across districts over 40 years. The penultimate section deals with the performance of growth rates of cereals across districts. The last section summarizes the major findings and also provides policy suggestions.

III. Performance of districts:

This section deals with the relative position of districts, which grow major coarse cereals (bajra, jowar, ragi and maize) Table 2, provides the districts which occupy different levels of area for cultivating jowar during 1960-61 and 2000-2001.

Table: 2. Distribution of districts based on their percentage share of area under Jowar

Table: 2. Distribution of districts based on their percentage share of area under Jowar

Rang in per cent	Years				
	1960-61	1970-71	1980-81	1990-91	2000-2001
< 1.02 percent	U.Kannada Kolar Hassan Mandya Chikkamagalore	U.Kannada Kodagu Bangalore Kolar Hassan Mandya Chikkamagalore	U.Kannada Mandya Kolar Hassan Chikkamagalore	U.Kannada Mandya Kolar Hassan Tumkur Chikkamagalore Shimoga	U.Kannada Hassan Shimoga Mandya Tumkur
1.03-6.19 percent	Shimoga Tumkur Mysore Bidar Chitradurga	Tumkur Shimoga Mysore Bidar Chitradurga	Tumkur Shimoga Chitradurga Mysore Bidar Bellary	Mysore Chitradurga Bidar	Chikkamagalore Mysore Chitradurga Bidar Bellary
> 6.20 percent	Bellary Dharwad Belguam Raichur Gulbarga Bijapur	Bellary Belguam Dharwad Raichur Gulbarga Bijapur	Belguam Dharwad Raichur Gulbarga Bijapur	Bellary Dharwad Belguam Raichur Gulbarga Bijapur	Belguam Dharwad Raichur Gulbarga Bijapur

It has been observed from Table 2 that a large number of districts (18) had allocated some portion of land for jowar cultivation. During the last phase (2000-

2001) of the study period only 15 districts had jowar cultivation. During the remaining study periods, 16 districts had jowar cultivation. Another striking feature is that there has been no cultivation of jowar during the entire study period in D. Kannada district, Kodagu and Bangalore districts had very limited area under jowar only during 1970-71. While Kolar district had allocated little area under jowar upto 1990-91 did not represent during 2000-2001. It is to be kept in mind that jowar though nutritions rich crop is losing its importance over the years. For instance, jowar was grown little less than 30 lakh hectares during 1960-61 and it declined less than 18 lakh hectares during 2000-2001 in Karnataka.

This table also reveals some notable observations in terms of area allocated under jowar across geo-physical regions. By and large jowar is cultivated only on a fraction of the area in central and southern districts. The remaining districts, fall under northern parts excluding Bidar clearly depict a large proportion upto 25 per cent is allocated under jowar. As it was observed earlier, this could be due to consumption patterns besides agro-climatic conditions. Jowar is a staple food in northern Karnataka and jowar stake is a common animal feed. Naturally the farmers tend to reserve more area under this crop (jowar). The National Commission on agriculture (GOI, 1976) in its detailed report observed that introduction of hybrid jowar received well only in the state of Karnataka. It is not an exaggeration to note that all states except Karnataka secured negative growth of area under jowar between 1967 and 1974.

Bajra is another coarse cereal, which is again found to be cultivated more in northern parts of the state. Also it is observed that a small number of districts cultivate bajra on a large scale as could be seen in Table- 3.

Table: 3. Distribution of districts based on their percentage share of area under Bajra

Rang in per cent	Years				
	1960-61	1970-71	1980-81	1990-91	2000-2001
< 1.02 percent	Bangalore Hassan Shimoga Chikkamagalore Dharwad Mandya Tumkur Mysore	Bangalore U.Kannada Mandya Chikkamagalore Shimoga Dharwad Mysore Tumkur	Bangalore U.Kannada Shimoga Chikkamagalore Dharwad Mysore Tumkur Kolar	Mandya Shimoga Kolar Tumkur Dharwad Mysore	Kolar Tumkur Mysore
1.03-6.19 percent	Kolar Bidar Bellary	Kolar Bidar Bellary Chitradurga	Bidar Chitradurga	Bidar Chitradurga Bellary	Dharwad Chikkamagalore Bidar Bellary
> 6.20 percent	Chitradurga Raichur Belguam Gulbarga Bijapur	Raichur Belguam Gulbarga Bijapur	Bellary Belguam Raichur Gulbarga Bijapur	Belguam Gulbarga Raichur Bijapur	Belguam Gulbarga Bijapur Raichur

Out of 19 revenue districts under study, 16 had districts cultivated bajra during

the initial phases (1960-61 and 1970-71) of the study period. Gradually this has declined to 15 during 1980-81, 13 during 1990-91 and finally 11 during 2000-2001. From this, it is found unlike jowar, bajra is not attracted among the growers. In many of the reference periods, about half of the total bajra growing districts fall within low range area coverage of less than 1.02 percent barring two study periods, i.e., 1990-91 and 2000-2001. It leads to conclude that this crop is not an attractive among the fanners. It was observed that unlike jowar, bajra is grown for commercial purpose and the fodder thus obtained is not well suited for livestock. Mruthyunjaya and Kumar (1989) found that between 1972 and 1983 area under bajra increased at 2.38 percent. But during 1984-86, it declined in this state. The farmer is mainly due to area expansion.

It is also evident that all southern districts except Kolar and Chitradurga fall within the low range area allocation under bajra (less than 1.02 percent). Even Kolar positioned itself in the low range at later stages of study periods (after 1980-81). Infact, Chitradurga, which fall at higher range (more than 6.20 percent) during 1960-61 continuously, fall in the medium range coverage of 1.03 to 6.19 percent at later periods, major northern districts.

Another notable observation is that northern districts alone occupy more than 90 percent of total area under bajra. Again Bijapur district alone occupies more than 40 percent of total bajra area in this state. It is to be remembered here that another coarse cereal (jowar) is also grown on large scale (more than 25 percent) in this district. Popular crop varieties such as KM 1 and HB-4 are very common bajra ideally suitable for this district. Bajra is used in the food processing industry for making biscuits and other item and less is directly consumed. In some household, there diary is engaged as an enterprise soaked bajra is given as feed animals. Distribution of districts with their area coverage (in percent) is given in table 4.

During the pre-green revolution study period i.e., 1960-61 maize is grown only in seven districts and it increased to 19 districts during 1970-71, later it declined to 18 districts and during 2000-2001 it further decreased to 17 districts. Despite this, the area put under maize cultivation is consistently increasing as observed earlier. Unlike for other coarse cereals (jowar and bajra) maize is evenly grown across the state. Very interestingly, Bangalore district allocated more area for maize during 1970-71 and 1980-81, lost its position during 1920-91 and 2000-2001. In other words, maize is becoming a less preferred crop here. Similarly Chikkamagalore, fall in the low coverage area upto 1990-91 and lost its position during 2000-2001.

Another set of districts like Gulbarga and Tumkur moved from low coverage range to medium coverage range (1.03 to 6.19 percent). This indicates that maize is becoming popular here in the recent past. Very notably some districts like Chitradurga, Bellary, Dharwad and Mysore strengthened their position by allocating more area under made during the later phases of the study periods. For instance, Chitradurga district did not allocate area for cultivating maize during 1960-61, consistently allocated more area and during 2000-2001, more than 2.6 percent of total maize area is noted in this district alone.

Table: 4. Classification of districts based on area under Maize

Rang in per cent	Years				
	1960-61	1970-71	1980-81	1990-91	2000-2001
< 1.02 percent	Bellary Raichur Kolar	D.Kannada Dharwad Chitradurga Kodagu Raichur Gulbarga Shimoga Tumkur	Kodagu U.Kannada Chikkamagalore Bidar Gulbarga Mandya Tumkur	U.Kannada Mandya Bidar Chikkamagalore Kodagu Gulbarga	U.Kannada Mandya Bidar Bangalore Kodagu
1.03-6.19 percent	Bidar Gulbarga	U.Kannada Bidar Mandya Chitradurga Bellary Hassan Mysore	Shimoga Raichur Hassan Kolar Dharwad Mysore	Tumkur Hassan Bangalore Raichur Shimoga Kolar Mysore	Gulbarga Tumkur Raichur Hassan Kolar Shimoga
> 6.20 percent	Bijapur Belguam	Kolar Bijapur Bangalore Belguam	Chitradurga Bangalore Bellary Bijapur Belguam	Bellary Chitradurga Dharwad Bijapur Belguam	Mysore Bellary Bijapur Belguam Dharwad Chitradurga

Ragi is another staple food especially in the southern parts of Karnataka. Powered ragi is used as regular food item is many or the households, irrespective of their socio and economic status. It was reported that one of the former prime ministers of India, hail from Southern Karnataka insisted to have ragi food items when he was foreign tour. It is a much lilted delicious food even by the working class. As a result ragi is grown across the state, though on a limited scale in the northern parts as could be seen from table 5.

Table: 5. Distribution of districts as per area allocated for Ragi

Rang in per cent	Years				
	1960-61	1970-71	1980-81	1990-91	2000-2001
< 1.02 percent	Bijapur Raichur U.Kannada Bidar D.Kannada Kodagu Gulbarga	Raichur Bidar D.Kannada U.Kannada Gulbarga Kodagu	Bidar D.Kannada Raichur U.Kannada Gulbarga Kodagu	Gulbarga U.Kannada Kodagu Belguam	Gulbarga U.Kannada Kodagu Belguam
1.03-6.19 percent	Dharwad Bellary Belguam Chikkmagalore Shimoga	Dharwad Belguam Bellary Shimoga Chikkmagalore	Belguam Dharwad Bellary Shimoga Chikkmagalore	Dharwad Bellary Shimoga Gulbarga	Dharwad Bellary Shimoga Chikkmagalore
> 6.20 percent	Chitradurga Mandya Hassan Mysore Kolar Tumkar Bangalore	Chitradurga Mandya Mysore Kolar Hassan Tumkar Bangalore	Mandya Chitradurga Kolar Hassan Mysore Tumkar Bangalore	Mandya Mysore Chitradurga Kolar Hassan Tumkar Bangalore	Mandya Mysore Chitradurga Hassan Kolar Bangalore Tumkar

It is to be noted that many northern districts allocated less area

ranging upto 6.19 per cent for the while study period for ragi. On the contrary, most of the southern districts had allocated more area for ragi during the entire the study period. Moreover, area allocation for this nutrition's rich crop is increasing over the years starting form merely less than one lakh hectares during 1960-61 to more than 10 lakh hectares in the state.

During the initial phase of the reference period (1960-61) all districts, under study had cultivated ragi and latter Bijapur did not allocate area for cultivating ragi. Similarly districts like Bidar, D.Kannada and Raichur which grew ragi up till 1980-81 lost their position. In other works, ragi is becoming a less preferred coarse cereal here.

Not many districts (excluding the above discussed ones) changed their position in terms of area coverage under ragi over the years. Very notably, Bangalore, considered as a fast growing urban centre consistently allocate more area for ragi. There is a greater demand for ragi stake in the urban centres in and around Bangalore for diary animals. Also it is easy for the fanners to market their grains in the city market yards. Whatever be the factors and seasons, ragi is considered as an important crop even in the highly fertile and irrigated districts like Mandya. In this district ragi is grown with almost care including irrigating the crop. A local agriculturist in Mandya district has developed a drought tolerant and pest resistant ragi called INDAF variety, which was cross pollenated with African ragi variety. This variety yields more and popular as compared with other ragi varieties.

Thus from the above discussions, it is clear that while jowar and bajra are common coarse cereals raised in most of the northern districts, ragi is largely cultivated in southern districts. Maize is grown in both the regions. Also it is observed that a couple of districts such as Bijapur and Gulbarga grew jowar and bajra on a large scale. Ragi is grown on a large scale in Bangalore and Turnkur districts. Maize is found to be largely raised in Belguam and Chitradurga districts.

By and large the total area under these four major course cereals Jowar, bajra, maize and ragi) is increasing over the years. This indicates that water saving and less resource intensive coarse cereals continue to dominate cereal cultivation especially in the dry land regions. However, it is to be noted that some districts diversify their cropping pattern there area under coarse cereals is diversed to cultivate other remunerative crops. On the other hand, the green revolution packages and other infrastructure did not come in the way of reducing the area under coarse cereals in some districts. Thus the poor men's nutrient rich coarse cereals continue to dominate the scene at least in the dry land regions.

IV. Growth rates:

The next section takes a look at the distributional patterns of districts based on their growth rates of area over different periods. Table.6 depicts the details of decadal growth Mom 1960 to 2001 for area under four major course cereals.

Table: 6. Distribution of districts according to their level of growth in the area of course cereals

Rang in percent	Years			
	1960-71	1970-81	1980-91	1990-2001
> -15.1	D.Kannada(-51.79) Gulbarga(-40.62) Raichur(-24.76) Dharwad(-16.76) Bellary(-15.05)	D.Kannada(-51.90) U.Kannada(-38.82) Mandya(-28.11)	U.Kannada(-51.58) Kodagu(-39.43) Mysore (-16.69.)	Shimoga(-60.49) U.Kannada(22.08) Bellary (-21.72)
0 to -15.0	Bijapur(-12.55) Belguam(-11.93) Bidar(-9.72) Tumkar(-7.11) Chitradurga(-0.61)	Bijapur(-13.86) Kolar (-12.81) Bangalore(-8.98) Tumkar(-5.56) Belguam (-4.54) Hassan(-3.38) Mysore (-0.27)	Shimoga (-13.78) Bidar (-13.40) Gulbarga(-11.38) Bijapur(-7.29) Bangalore(-6.43)	Belguam (-7.40) Raichur(7:39) Chikkamangalore (-9.41) Gulbarga (-6.29) Bidar(-5.29) Bangalore(-3.34) Mysore (-1.78) Kodagu (-1.59)
0.01 to 10	Mysore(5.40) Kolar (6.54) Shimoga(6.95) Bangalore(8.19)	Dharwad(4 09) Chitradurga (5.35) Chikkamangalore(9.14)	Kolar(1.24) Chitradurga(1-48) Dharwad(1.8) Hassan(2.75) Tumkar(7.26) Bellary(7.66)	Bijapur (2.30) Mandya(2.47) Hassan(3.69) Tumkar(7.87)
> 10.01	Chikkamangalore (25.51) Mandya(22.99) Hassan(43.04) Kodagu (46.08) U.Kannada(151.92)	Shimoga (11.0) Bellary (12.70) Gulbarga(13.90) Raichur(19.18) Kodagu (21.22) Bidar(21.54)	Belguam(10.36) Mandya(I 1.51) Raichur (18.56) Chikkamangalore(20.52)	Kolar (10 .54) Dharwad (24.85) Chitradurga(49.89)
STATE	(12.55)	(-0.30)	(-0.51)	(0.79)

Note: *Numbers in Parentheses indicate Percentage of decadal growth rate for area.*

The districts have been grouped into four i.e., (a) districts fall in the range of less than 15.1 percent growth; (b) districts fall in the range from zero to - 15 percent; (c) third set of classification includes the range from 0.01 percent to 10 percent and (d) the last set of classification includes the growth rate more than 10.01 percent.

Overall in the state between 1960-61 and 1970-71 there is a phenomenal growth in the area under coarse cereals (12.55 percent). Later between 1970-71 and 1980-81 there is a marginal decline (0.30 percent). It continued even during 1980-81 to 1990-91. Nonetheless, there is a marginal increase between 1990-91 and 2000-2001 in the area allocated for coarse cereals in this state.

By and large there is no pattern emerged in relation to geophysical characters (Northern or southern Karnataka) for growth rates of area under coarse cereals. Nonetheless, some-districts strengthened their positions. For instance, Bidar and Chitradurga showed during initial study periods negative growth for area allocation under course cereals, moved positively during the later reference periods. In other words these sets of districts started allocating more area for course cereals.

A noteworthy point is that Bijapur, which has allocated more area for jowar and bajra showed negative growth and only during 1990-2001 it showed a positive growth. Some districts did not show any clear pattern or direction in terms of growth rate for area under coarse cereals. In other words except a few traditional course cereal grown districts. Others are volatile in allocating land for cultivating coarse cereals.

Similar to that of growth rates for area under cereals, the same are worked out for production of cereals. Sufficient data have been given in Table.7. It could be observed form this

table during the first reference period (between 1960-61 and 1970-71) many districts demonstrated high growth rates for production of cereals. Not even single district reported as having negative growth of more than 15 percent point during the above periods. Only one district falls in the range of zero to minus 15.01 percent (Gulbarga). Six districts fall in the growth range from 0.01 to 35 percent. And the remaining 12 districts fall in the high growth range of more than 35.01 percent. Thus from the above discussion, it is possible to conclude that the green revolution techniques and technologies have made some studies in increasing the course cereal production between 1960-61 and 1970-71.

Table: 7. Distribution of districts according to their level of growth rate in production of coarse cereals

Range of Growth	Years			
	1960-71	1970-81	1980-91	1990-2001
> -15.0	--------	D.Kannada(-66.92) U.Kannada(-61.74) Kolar (-58.53)	U.Kannada(-54.12) Mandya(-44.72) Mysore (-40.65.) Gulbarga (-39.91) Chitradurga(-31.91) Dharwad(-26.05) Shimoga(-19.12) Bidar (-18.18)	Shimoga (-25.04)
0 to -15.01	Gulbarga(-6.63)	Bijapur(-11.22) Tumkar(-4.46) Shimoga(-0.82) Bangalore(-0.72)	Hassan(-14.01) Bellary(-7.39) Kodagu (-5.06) Bangalore(-3.73)	
0.01 to 35	Tumkar(9.8) Dharwad (12.0) Hassan(15.32) Belguam(17.76) Bijapur (23.04) Kolar (34.43)	Belguam(1.09) Kodagu (1.21) Mandya(13.19) Mysore (18.15) Raichur(24.31) Chikkamangalore (30.07) Bidar (32.67) Bellary(34.65)	Chikkamangalore (0.07) Tumkar(7.32) Raichur(22.08) Belguam(28.59)	Bellary(22.62) Bidar (33.37) Belguam(34.38)
> 35.01	Bangalore (42.95) Raichur(44.54) Bidar (44.86) D.Kannada(73.11) Mandya(78.45) Chitradurga(80.23) Mysore (90.93) Chikkamangalore (91.54) Bellary(108.65) Shimoga(149.84) U.Kannada (563.37) Kodagu (751.19)	Hassan(35.23) Chitradurga (35.98) Dharwad (36.28) Gulbarga(67.25)	Bijapur (49.62) Kolar (219.68)	U.Kannada (40.69) Raichur(47.24) Gulbarga(62.61) Bijapur (64.61) Kolar (66.99) Mysore (97.18) Hassan(97.23) Tumkar(101.0) Chikkamangalore (102.23) Bangalore (117.08) Kodagu (125.35) Mandya(178.78) Dharwad (216.62) Chitradurga (305.3)
State	(37.77)	(14.57)	(-4.33)	(35.50)

Note: *Numbers is parentheses indicate percentage decadal growth rate for production.*

But during the subsequent reference point i.e., 1970-81, many districts (including some displayed higher growth during the previous reference period 1960-71) fall in the range of negative growth. None of the districts

improved its position in the growth rates of production from 1970-71 to 1980-81. The situation is still bad during 1980-91. Some districts which fall high growth segment during 1970-81, tall in the negative growth redline as could be seen during 1980-91. For instance, Chitradurga, Gulbarga and Dharwad districts did not show any appreciable trend in terms of growth rates of production. But Bijapur and Kolar did exceedingly well in increasing their production.

The pattern of distribution of districts during 1990-2001 is somewhat on encouraging only one district (Shimoga) fall in the high negative growth regime between 1990-91 and 2000-2001. None of the districts falls in the range from zero to minus 15.01 per cent growth rate. All other districts either displayed high growth (15 districts) or moderate growth regime (3 districts of 0.01 percent to 35 percent.

Conclusions and policy suggestions:

This paper has brought out the macro patterns of growth, in area and production of major coarse cereals in the state of Karnataka. At macro level it is clear that jowar and bajra are extensively grown in a couple of districts such as Bijapur and Belguarn. Bijapur district alone has more than one fourth of cropped area under these two cereals. Maize and ragi are grown evenly across the state. Bangalore and Tumkur districts demonstrate in terms of allocating more are under ragi. Maize is found to be raised more in Belguam district. Besides agro climatic factors, local cultural factors are observed to be responsible for this trend. Based on the conclusions and observation this study suggests the following.

1. Serious attention must be paid to improve the overall performance of these poor men's crops. Perhaps necessary technical guidance starting from shorting seeds till harvesting is essential.
2. As these crop are considered as resource sharing and less irrigation intensive, cultivation of such crops is cost effective. Encouraging the farmers to take up these crops at least during the ideal periods on wet lands will yield positive impact.
3. Setting up of food processing units in coarse cereals growing districts will help getting value addition to the production. It is a welcome move that the NABARD has come out with a noval idea for providing credit facilities exclusively to start food processing units.
4. It is also important to develop cultivars of drought tolerant and pest resistant coarse cereals which are ideally suited for the local conditions. While bajra is susceptible to ergot / sugary disease maize is found suffering from problems of doung mildew, rust and foliar diseases. All these must be controlled for enhancing production.
5. Strengthening the market infrastructure in another crucial issue that needs immediate attention. In fact of later the government announces minimum support price for coarse cereals. But most of the times it is not actually reaching the growers. As a result of this a proposal for setting up of jowar / maize based was proposed by the farmer's associations. Perhaps the 'poor

men's' 'nutritious rich' crops will thrive if serious attempts are made in the dry land regions of the state. In fact the state government has entrusted the Karnataka State Cooperative Marketing Federation (MARKFED) to intervene if the prices of the coarse cereals fall below the minimum support price. However, the farmers continue to suffer to market their grains every year.

6. It has also been alleged that growers of fine cereals (paddy and wheat) lobbied for getting more minimum support price (MSP) as compared to coarse cereals. For instance, the government of India (GOI, 1999) announced Rs. 85 per quintal as MSP during 1978-79 and it has been steadily increased to Rs. 440 during 1998-99 for paddy. But the MSP per quintal of coarse cereals (jowar, bajra, ragi and maize) announced during 1978-79 was Rs.85 and it has been increased to just Rs. 390 during the same period. This sort of distributions is MSP be clearly addressed in the interest of growers.

7. The Public Distribution System (PDS) has been assigned with the task of supplying fine cereals. But due to local consumption behaviour especially in south India, the offtake of wheat is almost nil (Rajendran and Prabhuswamy, 1994 and GOK, 2001). Under this circumstance, locally preferred items including coarse cereals be allowed to distribute within the parview of PDS.

References:

Gopalan C, B. V. Rama Sastri and S. C. Balasubramanian (2000), Book on Nutritive Value of Indian Foods, publisher: National Institute of Nutrition, Indian Council of Medical Research, p-59

Government of India (1979), Report of the National Commission Agriculture, Ministry of Agriculture and Irrigation, New Delhi

Government of Karnataka (1960-2001), Annual and Season Crop Report various years, Directorate of Economic and Statistics, Bangalore

Hazra C R (2001), Crop Diversification in India: Crop Diversification in the Asia pacific region, FAO Corporation Documents Depository, RAP Publication2000/14

Mruthyunjaya and Praduman Kumar (1989), Productivity and stability in crop production on small farms in the states of north India, paper presented in Seminar on Economics of agriculture with special reference to viability and sustainability of small and marginal farmers, Hyderabad, 8-10 October.

Panini M N (1999), Trends in Cultural Globalisation, *Economic and Political Weekly, vol. 34, Issue No. 31, 31 Jul, 1999*

Rajendran S and P Prabhuswamy (1994), "Structural Adjustment Policies and Rural poor: A Preliminary Survey of two villages in Pudukotti district of Tamil nadu, Publisher: Institute for Social and Economic Change, bangalore.