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CHANGING PATTERNS OF DRAUGHT ANIMAL POPULATION IN SOUTHERN KARNATAKA

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ABSTRACT

As it is a known fact that the less capital and renewable source of energy is largely advocated and preferred is ecological suitable, economically viable and technologically feasible in the production. In the agrarian sector, the farmers started growing crops in their earlier stages of development and in the beginning they used only sharp stones and woods for sowing seeds. Later animals were trained and practiced for undertaking various farm operations in the production system. This study finds that the draught animal stock is declining at different levels over the years in all the sample districts. It may be due to various complex agro-environmental factors such as cropping pattern, rainfall, irrigation, soil condition, farm practices and so on.

KEYWORDS :Agriculture, Cropping Patterns, Draught Animals Population (DAP), Farmers and Livestock.

INTRODUCTION

Developing countries like India slowly the developing in the areas of science and technology has made remarkable progress in the methods and modes of farm practices. Now the farmers rely on various sources for farm power like human labourers, Draught Animals Population (DAP) and machineries. Of these, the first two sources are less capital intensive, ecological sound and economically viable. Though the farm machineries are required for completing the farm operations within a short duration, the other sources like labourers and draught animals are still preferred to a larger extent in the many part of the world (Bodet, 1987 and Rajendran, 1992). However, their growth appears to decline in many countries as the farm machineries are growing at faster rate. This is very

much noticeable in developed regions of the world the developing economics are forced to depend on biological sources of farm power (human labourers and draught animals). From this it is evident that the developing countries like India have in a paradoxical situation. On the one hand the excessive human as well as animal population is compelling the farmers to rely on the cheap source of farm power. And on the other hand, the growth in the agricultural income, need for leisure and other socio-economic factors contribute for faster growth of capital-intensive farm machineries. It is in this context the present paper makes a moderate attempt to examine the growth and distribution patters of draught animals in three selected districts of Karnataka namely, Hassan, Mandya and Mysore.

DATA SOURCE:

For the present study the data on the number of draught animals of cattle and buffaloes have been collected from various livestock census reports for the years 1961, 1972, 1983, 1990, 2003, 2011 and 2015. These periods have been considered, as the comparable data are readily available. The associated data like land use have been culled out from season and crop reports for the above referred years. The Simple growth rate of draught animal stock has been worked out to see the trend patterns. These districts were selected because 1) they have different levels of agricultural development including cropping patter, irrigation source, adoption of new farm technology and so on. 2) These districts fall in different geophysical characteristics. All these districts fall in southern part of Karnataka.

AREA OF THE STUDY:

In these districts famous bullocks such as Hallikar, Malnadgiodda, Kangeyam and Amruthmahal, are indigenous, sturdy and strong species, available for farm operations. Crossbred cows such as Jercy and H F varieties are available but not use on a large scale in agriculture. The well known buffalo species include Surthi and Murrah. Farmers from the selected districts buy mainly bullocks from the local cattle shandies or cattle fairs. Sometimes the farmers visit the adjoining famous cattle markets in Erode and Coimbatore districts in the neighboring state of Tamil Nadu where the well known sturdy cattle species like Umbalacherry, Kangeyam are being brought for sale. Most of the time the tiny peasants buy their draught animals either from the local cattle market or from the fellow farmers in the village itself or from the neighboring villages. The large farmers, who have command over large land holding, are very keen to buy healthy and good draught animals from far away places. More often in country side possessing costly animals is attached to economic status and hence the large farmers pay more attention in buying such animals.

A brief profile of these districts will give a picture of agricultural development. Hassan is partially irrigated by canal and mainly irrigated by tanks. Here major crops are coconut, sugarcane, paddy and some of minor millets. Some parts of Hassan district have undulated terrain. Mandya, another sample district is having assured irrigation source, river and canals. The lifeline river – the Cauvery – flows right middle of the district. A large bunch of canals and channels irrigate a major portion of the arable land in this district. This has led to grow water guzzling crops like paddy and sugarcane on a large scale. The soil is highly fertile and the farmers are found to be very enterprising. The infrastructure especially rural roads are appeared to be well connected with major roads in this district. The other selected district, Mysore has traditional cultural heritage and the river Cauvery irrigates some pockets of Mysore district. In fact rain-fed farming is practiced here on a large scale in H D Kote, Piryapattana, Hunsur, Najanagude and K R Nagar taluks. Main crops, raised in this district include paddy, tobacco, minor millets, sugarcane and so on. Though agriculture is main enterprise here, this district is fairly developed regarding the industrial development. The composite index

(Gowda and Gowda, 1999) of agricultural development for Karnataka across districts indicates the differences in the levels of development among the selected districts of the study. In fact this index was developed for all the 20 (undivided) districts in Karnataka during 1994-95 and for the present exercise only the sample districts are considered.

It is evident that there is a drastic change in the level of agricultural development in Hassan and Mandya districts over 46 years. This could be related with the major changes taken place in the areas of irrigation development and farm mechanization. Hassan district shows a downward development. Surprisingly Mysore district did not show any change in the levels of agricultural development between 1960-61 and 1993-1994.

ANALYSIS AND DISCUSSION:

1) Growth of Draught Animal Population (DAP):

This section takes a look at the growth and distribution pattern of draught animal stock in the selected districts. In the following table the actual number of draught animal stock in each category viz., cattle and buffalo has been furnished for the four study periods.

From the following table 1, it is evident that by and large all the sample districts indicate a declining trend on the draught animals. A striking point is that the alternative source of farm power stock – the farm machineries – would have increased at different levels in these districts. It is a known fact that the farm mercenaries are increasing in all the regions of the country and hence this phenomenon is not an exception to the sample districts.

Another point is that the percentage share of DAP of the selected districts varies considerably over the periods as could be seen from table 1. Mysore among the sample districts had more share of DAP, particularly cows during 1961 and all through the study periods it maintained the same position regarding DAP of cattle (bullocks and cows). The other two districts – Hassan and Mandya – while show a mixed trend for the draught cattle put under work the share of male stock (bullocks) is more in Hassan district and less in Mandya district. Nevertheless, the stock of the female work cattle (cows) does not show any clear patterns as the percentage share of these animals indicates a fluctuating situation.

Table-1: Distribution of Draught Animal Population (Stock) in the Selected Districts

Year	Stock	Male/ Female	Hassan	Mandya	Mysore	Karnataka
1961	Cattle	Male	1,83,369(5.48)	1,19,244 (3.56)	2,51,287(7.51)	33,45,810(100)
		Female	30,728 (8.79)	39,810 (11.39)	67,371 (19.27)	3,49,460 (100)
	Buffalo	Male	3,874 (1.49)	1,232 (0.97)	2,517 (0.97)	2,58,362 (100)
		Female	530 (2.34)	2,769 (12.27)	3,350 (14.85)	22,555 (100)
	Cattle		*(5.49)*	*(4.10)*	*(8.11)*	*3976187 (100)*
1972		Male	1,58,153(4.75)	1,34,353 (4.03)	2,27,145(6.82)	33,26,633(100)
	Buffalo	Female	42,344 (13.78)	36,793 (11.98)	57,296 (18.65)	3,07,083 (100)
		Male	2,698 (1.12)	638 (0.26)	2,816 (1.17)	2,39,900 (100)
		Female	1,078 (6.06)	688 (3.87)	3,035 (17.08)	17,765 (100)
			(5.24)	*(4.43)*	*(7.47)*	*38,91,381(100)*
1983	Cattle	Male	2,80,065(7.33)	1,25,014 (3.27)	2,57,177(6.73)	38,18,996(100)
		Female	66,044 (12.11)	93,947 (17.22)	1,02,880(18.7)	5,45,256 (100)
	Buffalo	Male	2,009 (1.17)	494 (0.28)	576 (0.33)	1,71,199 (100)
		Female	360 (2.40)	689 (4.65)	690 (4.60)	14,994 (100)
			(7.65)	*(4.83)*	*(7.94)*	*4550445 (100)*

1990	Cattle	Male	1,73,138(5.09)	93,864 (2.68)	2,42,460 (7.11)	34,09,472(100)
		Female		NA	NA	NA
	Buffalo	Male	3,599 (1.82)	553 (0.26)	871 (0.44)	1,97,073 (100)
		Female		NA	NA	NA
			(4.90)	*(2.61)*	*(6.74)*	*36,06,545(100)*
2007	Cattle	Male	199228(5.03)	71416(1.80)	222194(5.61)	3956183(100)
		Female	793304(6.24)	501442(6.24)	761954(6.00)	12695562(100)
	Buffalo	Male	20151(4.04)	7100(1.42)	5761(1.15)	498662(100)
		Female	191350(4.42)	168821(3.90)	66227(1.53)	4326980(100)
			(5.60)	*(3.48)*	*(4.91)*	*21477057(100)*
2012	Cattle	Male & Female	606460(6.37)	366740(3.85)	549552(5.77)	9516484(100)
	Buffalo	Male & Female	141264(4.07)	145516(4.19)	45419(1.30)	3470505(100)
			(5.76)	*(3.94)*	*(4.58)*	*12986989(100)*

Source: Livestock Census Reports for 1961, 1971, 1983,1990.
Note: 1) Numbers in parentheses indicate the district share in percentage in the state.
2) NA-Not available and since 1990 of 14th livestock census, female draught animal population is not enumerated.
3) Numbers in parentheses with italic indicates the percentage share of total DAP in each selected district to the state total.

Regarding the male draught animal stock of buffaloes, Hassan district had more share from 1961 to 1990 except for the study year 1972. However, the female buffaloes, put under work is found to be more in Mysore followed by Mandya and Hassan districts. Thus regarding the share of female DPA called work bovines of the sample districts, Mysore has been dominating as compared to other two districts – Hassan and Mandya - during the entire study period.

However, when all the work animals are put together, Mysore district had shown more share in all the study periods as compared with other sample districts. Of the other selected districts, Hassan has witnessed more draught animal stock as compared to Mandya in all the study periods from periods from 1961 till 2015. This could be due to the fact that as the availability of assured irrigation is more in Mandya as compared to other selected districts, the farm machineries such as tractors, tillers which substitute DAP would have increased manifold, from the above discussions considerably. This could be seen for each type of draught animal species.

2) Distribution of DAP:

Followed by this the area operated by a pair of draught animals including cattle and buffaloes is examined below. Instead of examining the aggregate data for understanding the draught animal stock, the availability of draught animals per unit of land area would be of more meaningful. The following table provides the information on the area operated by a pair of draught animals.

Table- 2: Area in Ha. Operated by a Pair of Draught Animals

Districts	1960-61	1970-71	1980-81	1991-91
Hassan	0.69	0.80	0.52	1.11
Mandya	0.83	0.76	0.80	2.08
Mysore	0.77	0.46	0.42	0.64

Source: Computed for various years from season and crop reports.

This table clearly indicates that area cultivated by a pair of draught animals varies across the selected districts. In fact during 1960-61 area operated by a pair of animals is found to be by and large same with a maximum area of 0.83 Ha. Cultivated in Mandya, a highly irrigated district and the less area 0.69 was operated in Hassan district, where tanks are the main source for irrigation. Nevertheless, during the area operated by a pair of animals was found to be more in Hassan followed by Mandya and Mysore. In fact the area operated declined in the later two districts i.e., Mandya and Mysore whereas this has increased largely in Hassan district during 1970-71 as compared with 1960-61. In the subsequent study period, i.e., 1980-81, the area operated increased in only one district – Mandya and declined in the other two selected districts as compared with 1970-71. However, it is noteworthy to observe that during 1990-91 in all the districts the area operated by a pair of draught animals is found to be increasing as compared with 1980-81. The area increase for the above period is very high i.e., 2.08 ha and 1.11 ha.

In fact the farm machineries are found extensively used in these districts, particularly in the highly irrigated district, Mandya. Tractors, threshers, cane crushers, power sprayers and irrigation pump sets are being found to inroad in this district. The agricultural research farm located near Mandya also fabricated and supplies the machineries and improved implements to the peasants with the help of the state run district agricultural wing. However, a cursory look at the dynamics of agricultural machineries at micro level reveals that the farmers-cum businessmen from the adjoining state, Tamil Nadu bring their farm machineries such as tractors, tiller and threshers, notably during the peak agricultural seasons to the southern district (including the selected districts for the present study) of Karnataka. Perhaps this would have forced the local farmers to opt the farm machineries on custom hiring rather than possessing draught animal stock. This would serve the twin purpose. First, this would facilities the farmers to complete the farm operations in a short period and second the expenses involved in maintaining the draught animals are avoided as observed by Nair (1990).

From the foregoing analysis, it can be summed up that area operated by a pair of draught animals show variations over the respective previous years of the study periods. It is also important to note that in the latest study period the area operated by a pair of animals is very high as compared with 1960-61. This clearly explains the following Firstly, there is a significant increase in the gross area cultivated in all the districts, except in Mysore and this would have increased the area operated by a pair of animals. As the statistics indicates the cropped area increased from 3.02 lakh hectares to 3.91 lack hectares between 1960-61 and 1990-1991 in Hassan and from 2.71 lakh hectares to 3.93 lakh hectares in Mandya. Nevertheless, the gross cropped area sharply declined from 4.95 lakh hectares to 3.09 lakh hectares during the above period in Mysore. Secondly, there is a compositional changes on the draught animals during the study periods. In other words, sex-wise analysis of draught stock indicates that male population is declining faster as compared to female population. In fact utilization of female draught animals especially cows are discouraged in many parts of the country as such animals are being considered as sacred by all the Hindu sects. Nonetheless, as observed by Rajpurohit and Muranjan

(1965), in Karnataka the cows particularly the weaned ones for largely used for undertaking various farm operations. Another study by Rajendran (1985) indicated that though farmers are reluctant to use cows in farming, for light operations such as threshing and ploughing on the irrigated fields cows used in the Cauvery delta of Thanjavur district.

The overall observation on the trend in the draught animal stock indicates that between 1960-61 and 2014-15 by and large both male as well as female draught animals of cattle and buffaloes has declined in all the selected districts. Perhaps this would have resulted in increasing the area operated by a pair of draught animals. Another factor could be that area put under cultivation is increasing in all the districts as new areas in dry regions are brought under plough and in the wet regions the intensity of land is increasing due to the availability of short duration high yielding seed varieties. However, it is meaningful to understand the growth of DAP and the following table 3 indicates the trend level in the selected districts.

Table- 3: Simple Growth Rates of Draught Animals (Bovines) Stock over the years

Districts	1961	1972	1983	1990	2007	2012
Hassan	218501	204273(0.67)	348478(0.71)	176737(-0.49)	1204033(5.8)	747724(-0.38)
Mandya	163055	172472(0.06)	220153(0.28)	94396(0.57)	748779(6.9)	512256(-0.32)
Mysore	322525	290162(0.10)	361334(0.25)	243330(-0.33)	1056136(3.34)	594971(-0.44)
State	3976187	3891381	4550445	3606545	21477387	12986989

Source: Compiled from various livestock census reports
Note: Numbers in parentheses indicate the simple growth rates for respective previous census and the un-bracketed numbers indicate the total draught animals stock.

This table indicated that the growth rates of draught animals stock over the years are fluctuating during the study periods from 1960-61 to 2012. Initially between 1960-61 and 1972 the stock declined in Hassan and in the later period from 1972 to 1983 all the selected districts showed an upward trend regarding the growth of draught animals. All the selected districts showed a downward growth rates in 1990-91 as compared to 1983. The magnitude of the decline in the growth rates is high for Mandya, followed by Hassan and Mysore during the above period. This could be attributed with the fact that the level of agricultural development would have influenced the growth of draught animals at different levels. In other words, as the level of development improves, the draught animal's stock declines as the farmers tend to go in for capital intensive source of farm power stock and this obviously reduced animal stock.

The other possible reason could be due to faster of agricultural machineries in these districts. Undeniably the farm machineries are increasing over the years as the farmers tend to reduce the drudgery of biological farm power sources such as laborers and draught animals. Naturally the increase in farm income as result of intensification of lands, adoption of commercial crops and a host of associated variables would have resulted in going for possessing farm machineries on a large scale (Basant, (1987). In fact this could be going in most parts of the Indian states especially after the introduction of green revolution packages during late sixties of the previous century (for detailed case studies see, ISAE, 1972). A study by Rajendran (1994) clearly found that the machine power increased much faster and the biological power either shown a marginal decline or stagnant over the years in the neighbouring state of Tamil Nadu. Further, this study observed that the availability of farm power stock is very high 1.92 hp/ha in this state than the recommended levels of 0.8 hp/ha by the National Commission on Agriculture in 1976 (GOI, 1976). Even the selected districts for the present study

appear to possess more quantum f farm DAP – power as it evident from the above discussions.

CNCLUSIONS AND POLICY IMPLICATIONS:

This study finds that the draught animal stock is declining at different levels over the years in all the sample districts. It may be due to various complex agro-environmental factors such as cropping pattern, soil condition, farm practices and so on. Since the DAP is considered as cheap and sustainable, the authorities must give priority for advocating DAP in the agricultural sector. Perhaps the rural artisans may be well trained to fabricate less complicated but more suitable farm implements to carry out farm operations in a smooth manner. In fact some NGOs like CARTMAN of Bangalore are working on the fabrication of less drudgery implements, which could be replicated in a large scale in rural Karnataka (Ramaswamy, 1985). The other option could be that the subsidy on heavy machineries such as tractors and threshers may be reduced to discourage their popularity. As Sethuraman (1970) and Sathishchandran (1985) suggested despite there is a manifold growth in farm machineries the role of draught animals can not be neglected in the short run and hence systematic effort should be made to upgrade the indigenous draught animal stock.

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