



Research Paper

Characterization of farming systems adopted by small and marginal farmers in Raichur district of North- East Karnataka

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ABSTRACT : This study characterizes existing farming systems adopted by small and marginal farmers in Raichur district of North-East Karnataka (16° 12' N latitude and 77° 20' E longitude at an altitude of 389 m above the mean sea level). A rapid rural appraisal was conducted *via* informal discussions with 125 randomly selected farmers (25 farmers each from Raichur, Manvi, Sindhnur, Lingusugur and Devdurga talukas of Raichur district) using a pre-tested, structured questionnaire. Farming was the main income-generating source for the majority of households in the area. This study distinguished farms based on various farm enterprises adopted in their respective farms *viz.*, crop based, dairy based, small ruminants (goat/ sheep) based, vegetable based, agro-forestry based, horticulture based etc. Paddy, cotton, maize, ground nut, vegetables, cattle, sheep/goat and poultry farming were the major farming activities that were undertaken by the farmers. Socio-economic status of most of farmers is determined by farming system adopted in their farm. Proper integration among crop-livestock farming activities could be suggested as a better solution to enhance long term sustainability as well as farmers' living standards by improving farm production. Among 125 farmers selected for characterization 98.4 per cent of the farmers adopted crop based farming system.

KEY WORDS: Characterization, Integrated farming system (IFS), Rapid rural appraisal (RRA), Survey

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INTRODUCTION :

India has basically an agriculture-driven economy. Where, agriculture and allied activities contribute about 17.9 per cent to the gross domestic product (GDP) and the growth rate of agriculture is around 2 per cent (Anonymous, 2015a). Indian agriculture employs 58 per cent of the total work force and it is the major source of

poverty alleviation, empowerment of the agrarian folk and it is the corner stone of development for India (Anonymous, 2015b). As a result of sustained efforts food grain production has increased from 50.8 million tons in 1950-51 to 257 million tonnes in 2014-15 (Anonymous, 2015c).

In India, where majority (84.97 %) of the farming community belongs to small and marginal farmers having

only 44.31 per cent of the total operational area, specialized farming may not be viable and sustainable in the long run (Singh *et al.*, 2010). The average size of the farm in India has been declining and over 80 million out of 105 million operational holdings are below the size of 1.0 ha and poses a serious problem in general in India and in Karnataka in particular. The farmers, particularly those belonging to small and marginal category are unable to meet both the ends with the income from cropping alone. With gradual decline in farm size, it has become increasingly difficult to produce enough food and other farm produces for the family. The situation is further weakened due to repeated failure of monsoons on one side and on the other side, due to ever increasing population and decline in per capita availability of land. Further, there is hardly any scope for horizontal expansion of land and only vertical expansion is possible by integrating various farm enterprises requiring less space and time thus, ensuring periodic income to the farmer (Behera *et al.*, 2001). The integrated farming systems, therefore, assumes greater importance for sound management of farm resources to enhance the farm productivity, reduce the environmental degradation, improve the quality of life of resource poor farmers and to maintain the sustainability.

The farming system in general comprises of a complex arrangement of various components like crops, livestock combination or enterprises and other resources within the given environmental setting. The farming system takes into account consumption needs of the family, economic factors like relative profitability of the technically feasible enterprises, availability of farm resources, infrastructures and institutions such as irrigation, marketing facilities including storage, transportation and credit (Ram and Singh, 2008). Whereas, integrated farming system consists of a range of resource-saving practices that aim to achieve acceptable profits and high and sustained production levels, while minimizing the negative effects of intensive farming and preserving the environment, based on the principle of enhancing natural biological processes above and below the ground (Rota and Sperandini, 2010). Hence, the study was conducted to characterize various farming systems adopted by small and marginal farmers at Raichur district of North-Eastern parts of Karnataka.

MATERIALS AND METHODS :

The study area:

North-East Karnataka agricultural zone is one of the ten agricultural zones in Karnataka state. It comprises of six districts namely: Raichur, Koppal, Bellary, Bidar, Kalaburagi and Yadgir. The survey was conducted in Raichur district comprises of 5 talukas (Raichur, Manvi, Sindhur, Lingusugur and Devdurga). Raichur district surrounded by Yadgir, Bijapur, Baglkot, Koppal and Bellary districts and in eastern side surrounded by Mahboobnagar district of Andhra Pradesh. The two rivers Krishna and Tungabhadra flows through northern and southern boundaries of the district. The study area is within North-Eastern dry zone. The soil is classified as moderately drained deep black soil which is easy to till.

Farming is the predominant occupation:

Farming is carried out at the family level and it is mainly for subsistence. The little surplus production that may be generated is sold for money used to purchase non-farm commodities. Major crops grown are cotton, paddy, arhar, ground nut, sunflower, *Rabi* jawar, maize etc. Among these cotton and paddy occupies major area of the cultivable land in the district. Among horticulture crops, banana, mango, citrus, guava, sapota, pomegranate and papaya occupied major area. Livestock's, namely, dairy and small ruminants (sheep/ goat) rearing occupies major subsidiary enterprise with cropping. The agricultural zone was chosen because of the prevalence of various types of IFS with its fast growing population and commercial activities. The city and interstate demand serves as a viable market for farm products produced in the zone.

Data collection :

The study was conducted during 2012-13 in various mixed farming systems in Raichur district of North-East Karnataka. Prior to the structured survey, a rapid rural appraisal (RRA) was conducted through informal discussions with leading small to medium scale farmers, professors of university, subject matter specialists of Krishi Vigyan Kendra (KVK), officers of agriculture department and extension workers. Data for the study were collected through primary sources. Primary sources of data, which were cross-sectional, comprise of the use of structured questionnaire items administered to the farmers. On the other hand, secondary data were

obtained from relevant publications and office data of agriculture department. 125 randomly selected farmers were interviewed (25 farmers each from Raichur, Manvi, Sindhur, Lingsugur and Devdurga talukas). The questionnaire was designed to collect information on various farm enterprises adopted by farmers selected

comprises inputs, outputs, water source, crop suitability, integration, marketing, socio-economic situations and involvement of households. The location of study area (125 farms) were demarked with the help of global positioning system (GPS) and the map for the study area was drawn with ArcGis software (Fig.A).

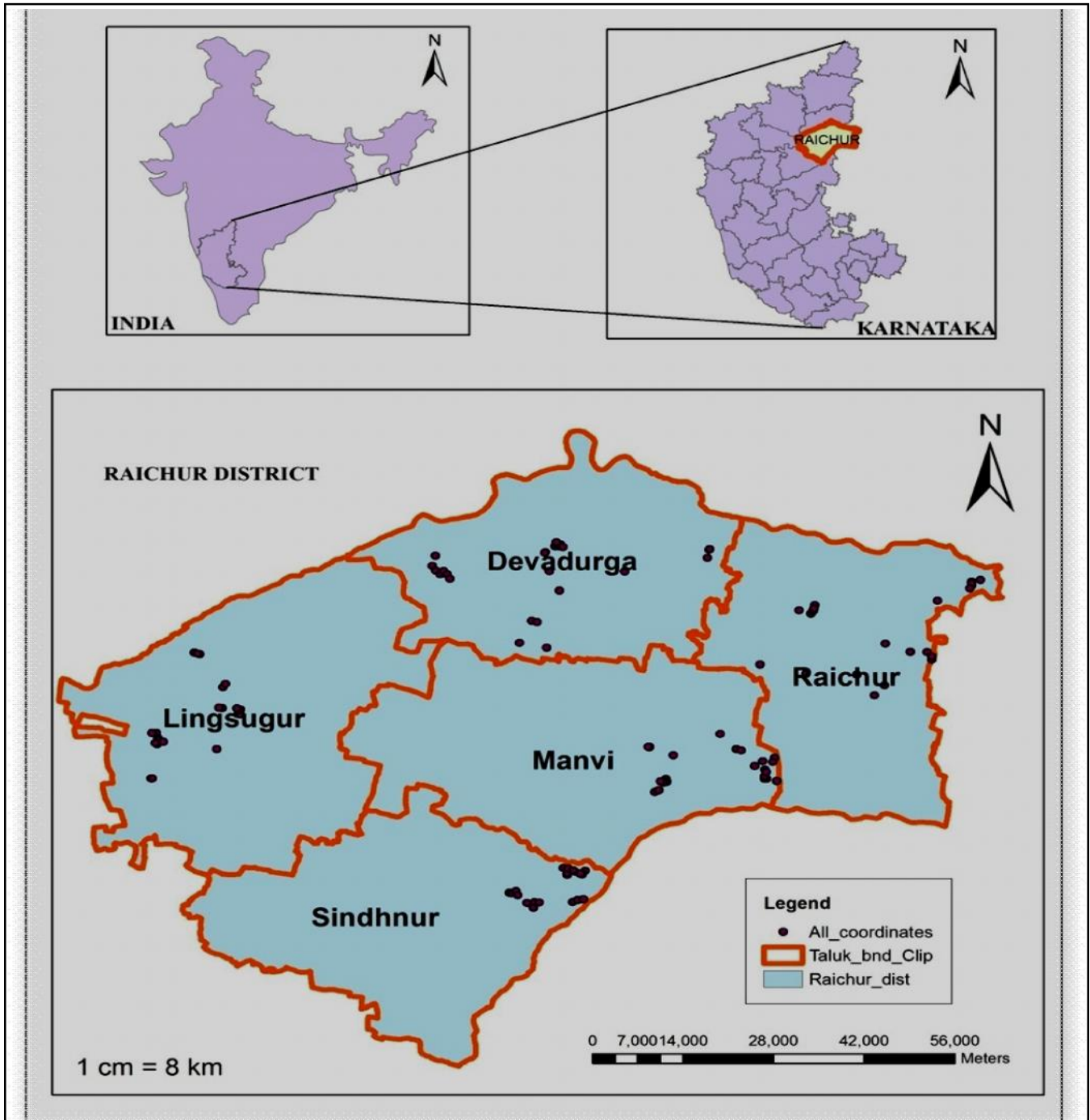


Fig. A : Location map of selected talukas of raichur district under study area

RESULTS AND DATA ANALYSIS :

Addition to crop cultivation alone, farmers are engaged in other farming components. The dynamics of productivity and sustainability of the integrated farming systems are determined by interaction among sub-systems (*i.e.*, cotton, paddy, groundnut, dairy, goat/ sheep farming and poultry) and the social structure of the systems. Table 1 shows the delineation of existing farming systems in Raichur district (Raichur, Sindhanur, Manvi,

Lingusugur and Devdurga). Out of 125 randomly selected farmers (25 farmers from each taluka) 98.4 per cent of farmers are practicing crop based farming system whereas, remaining 1.6 per cent farmers adopted horticulture based farming system. Out of 98.4 per cent of farmers 79 per cent of the farmers of Raichur district practicing cotton based farming system in their farm with various agricultural enterprises *viz.*, dairy, small ruminants, poultry birds, vegetables, fruit crops and agro-forestry. Among the various IFS models adopted by the

Table 1 : Farming systems adopted by the small and marginal farmers of Raichur district of North-East Karnataka agricultural zone (n=125)

Sr. No.	farming systems	Farmers	
		Frequency	Percentage
	Crop	123	98.4
1.	Crop + Dairy	80	64
2.	Crop + Small ruminants (Sheep/ Goat)	58	46.4
3.	Crop + Poultry birds	41	32.8
4.	Crop + Vegetables	47	37.6
5.	Crop + Fruit crops	53	42.4
6.	Crop + Agro-forestry	7	5.6
7.	Crop + Dairy + Small ruminants (Sheep/ Goat)	44	35.2
8.	Crop + Dairy + Poultry birds	35	28
9.	Crop + Dairy + Vegetables	33	26.4
10.	Crop + Dairy + Fruit crops	36	28.8
11.	Crop + Dairy + Agro-forestry	5	4
12.	Crop + Small ruminants (Sheep/ Goat) + Poultry birds	30	24
13.	Crop + Small ruminants (Sheep/ Goat) + Vegetables	31	24.8
14.	Crop + Small ruminants (Sheep/ Goat) + Fruit crops	37	29.6
15.	Crop + Small ruminants (Sheep/ Goat) + Agro-forestry	6	4.8
16.	Crop + Poultry birds + Vegetables	21	16.8
17.	Crop + Poultry birds + Fruit crops	23	18.4
18.	Crop + Poultry birds + Agro-forestry	5	4
19.	Crop + Vegetables + Fruit crops	28	22.4
20.	Crop + Vegetables + Agro-forestry	4	3.2
21.	Crop + Fruit crops + Agro-forestry	7	5.6
	Fruit crops	2	1.6
1.	Fruit crops + Dairy	2	1.6
2.	Fruit crops + Small ruminants (Sheep/ Goat)	1	0.8
3.	Fruit crops + Vegetables	2	1.6
4.	Fruit crops + Dairy + Small ruminants (Sheep/ Goat)	1	0.8
5.	Fruit crops + Dairy + Vegetables	1	0.8
6.	Fruit crops + Dairy + Small ruminants (Sheep/ Goat) + Vegetables	1	0.8
7.	Fruit crops + Small ruminants + Vegetables	1	0.8

farmers 64 per cent were integrated dairy farming as a major component followed by small ruminants (46.4 %). After these small and marginal farmers incorporated fruit crops for stabilized income during the non-cropped seasons (42.4 %). Poultry and vegetable farming along with crop were considered as quick returns among various components (32.8 and 37.6 %, respectively).

Integration of various agriculture and allied enterprises plays a great role in improving socio-economic situations of farmers. Almost all the farmers were engaged in mixed farming. A greater proportion of the household income was generated through farm products. Consequently, it is reasonable to state that households in the study area mainly relied on farming for their income. Ecological, socio-economic and resource factors of the study area differ from one place to another. Therefore, differences among farming systems could be observed. In IFS, animals were allowed for free grazing in fallow paddy fields and agro-forestry fields whereas, during cropping period they are being stall fed. In IFS, income was mainly derived from sale of surplus crop yield, animals for meat and milk (Abeyrathne, 2007). At the end of each year, the farmer earned a large sum of money by selling crops, vegetables, milk and animals (slaughter). The farmer looked after the milking animal throughout the year and milked in order to fulfill his daily necessities. Livestock management was closely related to the social, cultural and religious lives of the farmers and this could be observed in both farming systems as well (Devendra and Thomas, 2002). Meat production was more prominent components for higher returns. Meat sale during Muslim's festival is most profitable than other season, Therefore, farmers adopted IFS earned considerable profit over cropping alone.

Conclusion:

– There were various types of farming systems practiced by the small and marginal farmers of Raichur district of North-East Karnataka agricultural zone. Production in the farming could be increased by adopting a proper integration and recycling of farm inputs and outputs.

– Integration of crop-livestock farming activities ensures the long-term sustainability of the farming systems.

– Animal components act as insurance for the farm

family, especially during crop failure.

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