A Pragmatic Approach to Addressing Needs of Crop and Dairy Farming System in the Peri-Urban Area

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ABSTRACT

Increase in the urban population leads to increase in demand for quality food and milk in India. Moreover, the future urbanizing India is greatly depending upon the farming in the fringes of towns and cities to meet its increasing food demand. This has many advantages to the peri-urban crop and dairy farmers. However number of constraints limit the production potential of crop and dairy farming in peri-urban areas. So, the present study was undertaken in peri-urban area of Bengaluru, Karnataka. The identified advantages and constraints pertaining to crop and dairy production system along with suitable strategies were described for further encouragement of peri-urban farming. Findings indicate that additional source of income, remunerative price for milk, high demand for fresh milk were found to be the major advantages of peri-urban dairy production system. In crop production system, easy market access to farm produce, less cost in transportation of farm produce and huge demand for fresh fruits, vegetables and flowers were the major advantages in peri-urban. Major constraints in practicing peri-urban dairy farming were; increase in frequency of disease incidence in dairy animals, non-availability of fodder in time and insufficient land availability for fodder production. Non-availability of irrigation water, non-availability of labour for farm work and increase in labour cost in peri-urban region were reported as serious constraints in peri-urban area of Bengaluru region.

Key words: Peri-urban area, advantages, constraints, crop production system, dairy production system.

INTRODUCTION

Practising dairy and crop production in peri-urban in terms possess more advantages as compared to farming in distance rural areas. Peri-urban agriculture has been pictured as a potentially profitable activity, especially in Asia (Jansen *et al.* 1996, Vagneron 2007). But, at the same time it faced many constraints which limit the growth of both dairy and crop production. Moreover, peri-urban activities may be making vulnerable by the highly indecisive environment in which they are undertaken. Farming in the fringes may further exaggerate existing pollution problems, decrease in per capita availability of land, land acquisitions and transactions, decrease in livestock population, use of more chemicals and scarcity of agriculture labour *etc.* Therefore the possibility of carrying out intensive production on small plots of land is often quite well adapted to the urban environment where water and land are scarce which consequences the pollution of drinking water resources and food products, increased air pollution and the transmission of infectious diseases where livestock is involved (Vagneron 2007) and livestock is a major part of peri-urban farmers along with commercial oriented crop production in peri-urban areas. Major constraints faced by the peri-urban farmers in crop and dairy production are also greatly pulling back the farmers to achieve a reasonable profit and unable to meet urban food demand. In this backdrop, it is important to understand the dynamics of peri-urban farming in light of expansion of cities and urban population. So, this paper highlight the possible solutions for constraints faced by farmers in the peri-urban area of Bengaluru and focus on the bottlenecks and emerging advantages of peri-urban farming that may help in understanding the prospectus of peri-urban farming.

METHODOLOGY

The present study was undertaken in peri-urban area of Bengaluru, Karnataka. Four blocks (taluks) around the city periphery *viz.*, Bengaluru East, Bengaluru North, Devanahalli and Hoskote were selected purposively due to its peri-urban characteristics. Two villages were randomly selected from each block. From each village 20 respondents were selected randomly. Hence, a total of 160 farmer households constituted the sample size. The advantages and constraints pertaining to dairy and crop production system were measured with the help of pre-tested interview schedule developed for the study and detailed reasons obtained through focus group discussion.

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For prioritising the advantages and constraints Rank Based Quotient (RBQ) was calculated on the basis of rank assigned by each farmer against to prioritize the advantages and constraints in the crop and dairy farming prevailing in the study area by using following formula-

$$RBQ = \frac{\sum_{i=1}^{n} fi(n+1-i)}{N \times n} \times 100$$

Where,

fi = Frequency of farmers for the ith rank of the attribute
N = Total number of farmers contacted
n = Total number of ranks
i = Rank of the attributes

RESULTS AND DISCUSSION

Advantages in peri-urban crop and dairy production system

Table 1: Prioritised ranking of advantages in peri-urban crop production system

Advantages	Frequency of response for respective rank					Total (N)	RBQ Value	Overall rank
	I	II	III	IV	V			
Easy market access to farm produce	64	32	64	0	0	160	80	I
Less cost in transportation of farm produce	36	72	32	8	12	160	74	II
Huge demand for fresh fruits vegetables and flowers	32	40	32	52	4	160	65.5	III
Scope to sell produce in the peri-urban locality itself	32	10	8	68	42	160	50.3	IV
Remunerative price for farm produce	4	14	20	32	90	160	36.3	V

For the purpose of study, Peri-urban area of Bengaluru is defined as the region around the Bengaluru city periphery which includes Bengaluru urban and rural districts which falls under Bengaluru metropolitan region.

The data presented in table 1 findings indicate that easy market access to farm produce had highest RBQ value 80, Easy access to market is major constraints for the distance rural farmers and increase post-harvest losses for perishable crops. But it was minimum for peri-urban farmer due to near access to markets. Further, less cost in transportation of farm produce was considered as second most advantageous factor with RBQ value of 74 as the distance was less and availability of transport facility in time as compared to the hinterlands. Huge demand for fresh fruits vegetables and flowers was considered as third most advantageous parameter with RBQ value of 65.5. Besides, scope to sell produce in the peri-urban locality itself (36.6) is the another advantage to the peri-urban farmers due to ensured market for the produce by large urban population and remunerative price for farm

produce with RBQ value 36.3 is the least advantage reported by the farmers.

Table 2: Prioritised ranking of advantages of peri-urban dairy production system

Advantages	Frequency of response for respective rank						Total (N)	RBQ value	Overall rank
	I	II	III	IV	V	VI			
Additional source of income from peri-urban dairy farming	69	26	8	33	20	4	160	74.9	I
Availability of remunerative price for milk	39	70	8	11	16	16	160	72.6	II
Productive employment to utilise the women's leisure time	19	23	45	54	7	12	160	62.2	III
Easy access to marketing of milk	7	25	63	30	19	16	160	58.6	IV
High demand for fresh milk	4	4	19	28	82	23	160	40.7	V
Scope for marketability of value added dairy products	10	16	17	8	20	89	160	37.6	VI

The advantages of peri-urban dairy production system perceived by farmers are presented in table 2 findings indicate that additional source of income from peri-urban dairy farming had highest RBQ value 74.9, thus reported as most advantageous by the farmers. The focus group discussion reveals that most of the farmers in peri-urban areas were depending on variety of livelihood options where dairy act as a supportive source of income and considered dairy as an additional source of their family income for the majority of households. Further, availability of remunerative price for milk was considered as second most advantageous factor with RBQ value of 72.6. But in findings by Vyas and Patel (2001), Chinnadurai *et al.* (2002), Manoharan *et al.* (2003), Kumar *et al.* (2006) and Kumar *et al.* (2012), who also observed that the non-remunerative price for milk is the major constraints in their studies.

This is mainly because most of the studies are in tribal and rural areas and in different states but in present peri-urban study it shows that farmers getting satisfactory price for their milk in peri-urban area of Bengaluru. Farmers were getting price for their milk through milk co-operative society with price of about ₹ 23 to 25 /lit (based on fat percentage) along with the support price by the state govt. about ₹ 4 bonus/lit would help the farmers to earn good income from dairy. Another case is the peri-urban farmers sold their milk to the near urban areas selling of milk to the hotels, tea stall, urban dwellers *etc.* will fetch ₹ 30/lit prices. Productive employment to utilise the women's leisure time was considered as third most advantageous parameter with RBQ value of 62.2. Besides, easy access to marketing of milk (58.6) mainly because of availability of well-structured milk

cooperative societies in every village near to urban areas, High demand for fresh milk (40.7) is the fifth most advantages of peri-urban dairy as the demand for fresh milk from peri-urban farmers by the urban dwellers was more and people choice for fresh milk from dairy farmers was more than that of packaged milk. Finally scope for marketability of value added dairy products (37.6) were other advantages reported by farmers in peri-urban area.

Due to lack of knowledge and awareness on the marketing and value addition of milk hinders them to explore the scope for marketability of value added dairy products and it was least advantage perceived by the farmers.

Constraints in peri-urban crop and dairy production system

Table 3: Prioritised ranking of the constraints in peri-urban crop production system

Constraints	Frequency of response for respective rank					Total (N)	RBQ Value	Overall rank
	I	II	III	IV	V			
Non–availability of irrigation water	71	34	42	12	1	160	80.3	I
Non – availability of labour for farm work	74	24	46	6	10	160	78.3	II
High cost of labour	13	91	49	3	4	160	73.3	III
Wide seasonal variation in prices of farm produce	3	5	13	84	55	160	37.1	IV
Escalating input costs	5	6	18	50	81	160	35.5	V

The constraints in peri-urban crop production system perceived by farmers are presented in table 3, findings indicate that non-availability of irrigation water had highest RBQ value 80.3, thus reported as serious constraint faced due to severe ground water exploitation. More importantly, lakes and tanks help recharge the ground water table (which has been declining in urban areas due to over-extraction. Some tanks have been systematically destroyed for construction of urban structures. During the early twentieth century, Bangalore City had about 257 lakes. Less than half the number exists today (Sawhney *et al.* 2003). Similar results also obtained by Raju (2011), in his study in Bengaluru rural district. Further, non-availability of labour for farm work considered as second most serious constraint factor with RBQ value of 78.3, this constraint was mainly because of diversion of agriculture labours to non-agriculture activities especially female workers diverted to daily wage labours in garment factories in their near peri-urban locality of Bengaluru. High cost of labour with RBQ

value 73.3 is also a major constraints faced by farmers. Beside these wide seasonal variations in prices of farm produce (37.1) and escalating input costs with RBQ value 35.5 are the important constraints faced by farmers. These results are similar to the results obtained by Pawan (2010) and Raju (2011), investigated the constraints in peri-urban crop production.

Table 4: Prioritised ranking of constraints in peri-urban dairy production system

Constraints	Frequency of response for respective rank						Total (N)	RBQ Value	Overall rank
	I	II	III	IV	V	VI			
Increase in frequency of disease incidence in dairy animals	109	11	5	15	20	0	160	84.8	I
Non-availability of fodder on time	20	15	75	25	20	5	160	64.1	II
Insufficient land availability for fodder production	5	50	25	65	10	5	160	62.5	III
High cost of concentrate feed	10	60	5	30	15	40	160	56.3	IV
High cost of private extension service at farmer's site	5	25	25	35	50	20	160	50.0	V
Difficulty to access immediate veterinary services	5	1	30	5	30	89	160	33.2	VI

The constraints in peri-urban dairy production system perceived by farmers are presented in table 4 findings indicate that increase in frequency of disease incidence in dairy animals in the peri-urban dairy farming had highest RBQ value 84.8, thus reported as most serious constraint faced by farmers. Similar findings revealed by Singh and Chauhan (2006), Dhaka *et al.* (2011), Kumar *et al.* (2012) and Gunaseelan (2014), which showed high incidence of diseases and pests by majority of the farmers as the key factors limiting the livestock production. The main reasons behind this was mainly due to more and more adoption of high yielding cross breed animals in peri-urban areas which are most vulnerable to diseases as compare to the indigenous animals. Further, non-availability of fodder on time was considered as second most serious constraint with RBQ value of 64.1. Similar findings were reported by Sirohi and Sirohi (1997), Chinnadurai *et al.* (2002), Singh *et al.* (2004), Pushpa (2006) and Sabapara *et al.* (2012), as major feeding constraints in their studies. In case of peri-urban area of Bengaluru this may be due to non-availability of irrigation water, labour and land affecting the production of fodder throughout the year. Insufficient land availability for fodder production was considered as third most serious constraints with RBQ value 62.5 which is mainly due to more selling and acquisition of farm land in the peri-urban region. Besides, high cost of concentrate feed (56.3), high cost of private extension service at farmer's site (50.0) and the difficulty to access immediate veterinary services with RBQ value 33.2 was considered

as among the constraints perceived by the farmers. Similar findings were revealed by Manoharn *et al.* (2003), Meena and Fulzele (2004), Singh *et al.* (2004), Kumar *et al.* (2006), Kumar *et al.* (2012) and Sabapara *et al.* (2012) in different regions of the country.

CONCLUSIONS

The present study brought out the most important advantages of the peri-urban crop and dairy farming. The results highlighted the advantages of farming in fringes in terms of market availability, low transportation charges, huge demand for fresh vegetable and milk, availability of inputs as compare to farming in hinterland where far away from cities. So, there is need to encourage the peri-urban crop and dairy production to harness the advantages. Promotion of user friendly selective mechanization in crop and dairy including drip and sprinkler irrigation, labour efficient technologies, would help to overcome from scarcity of labour problems, Strict implementation of environmental laws to control pollution problems on crop and livestock in peri-urban is essential. Increasing cross breeds and disease incidence in peri-urban areas need a segmented approach such as demarcation of areas and developing guidelines for peri-urban dairy farming. Inadequate availability of water was identified as the major constraint in peri-urban region of Bengaluru. which require sensitization of farmers on water use efficiency and rainwater harvesting methods. Compulsory implementation of rainwater harvesting in all new constructions can increase the ground water level in the peri-urban area of Bengaluru.

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