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Socio-economic pattern of fodder markets in urban and peri-urban areas

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Abstract
Fodder marketing is emerging as an important entrepreneurial activity in urban and peri-urban areas in response to increasing urbanization stretching from urban areas to surrounding villages. Unorganized fodder markets are operating in several places in the country to cater the needs of these farmers. A study was conducted in May and June 2015 to assess the structure and functioning of fodder markets and their constraints in Karnal and Hisar cities in Haryana. Significant number of entrepreneurs (40%) possessed experience in fodder business upto 5 years which indicated that many entrepreneurs were recently attracted in this business in Karnal while respondents had longer experience in Hisar. The entrepreneurs predominantly located their business unit in Karnal (96.67%) and in Hisar (100%) by considering the availability of large number of local customers. The marketing of the fodder in the auction centre of Karnal is done by open auction method. However, entrepreneurs directly purchased the fodder from farmers in Hisar by arranging vehicles on their own. Shortage of fodder supply during summer in market was reported to be the major constraint of respondents in Karnal (70%) and Hisar (84.62%). The study warrants focusing on educated unemployed youth in the fodder marketing entrepreneurship through special incentives and schemes to facilitate the sustainable growth of dairy farming in urban areas.

Keywords: Constraints, Entrepreneurship, Fodder market, Fodder supply chain, Urban area

Introduction

In India, large number of rural families derives their substantial income and employment from dairy farming. Besides providing regular income for subsistence, dairying serves as insurance in the event of crop failure. Feed and fodder constitute about 70 per cent of cost of milk production. Thus, cultivated fodder has an important role in meeting the nutritional requirements of animals to produce milk most economically as compared to concentrate feeds. However, the productivity of dairy animals is greatly constrained by the lack of green fodder and good quality feed (Misra *et al.,* 2005). At country level, area under permanent pasture & grass land has declined from 120 to 102 lakh hectares during 1980–81 to 2007-08 (Dixit *et al*., 2015). It was estimated that still crop residues dominate as fodder source (54%) followed by cultivated fodder (28%) and remaining by grasslands (Hegde, 2006).The green and dry fodder gap was reported to be 63.50 per cent and 23.56 per cent in 2015 which are likely to further increase to 64.87 per cent and 24.92 per cent in 2025 respectively (Planning Commission, 2001).

Fodder marketing is an emerging opportunity in view of incentives for livestock productivity. The enterprising farmers especially in the urban and peri urban areas, where cultivation as such is not possible, and sourcing the materials from rural or in some cases peri urban areas is the main option. Fodder markets especially in urban/ peri urban areas which were originally the source for the hobby livestock owners, are now becoming the main source for the commercial and modern dairy and other livestock farms.

Urban dairy farming in India is the important source of fresh milk for urban people (Ravi, 2015). These urban dairy farmers mostly depend on market or local fodder traders for the fodder because of unavailability of farm land to grow fodder in cities. In urban areas, there is a set up of unorganized fodder marketing through local fodder entrepreneurs which helps to reduce the fodder scarcity in the urban dairy farms. Hence, a study was undertaken to ascertain the dynamics and effectiveness of fodder entrepreneurs to address the demand and supply of fodder in urban and peri-urban dairy farms.

Materials and Methods

Study area: A study was conducted in Karnal and Hisar districts of Haryana since it is considered as a place for boosting dairy farming in view of enormous infrastructure and resources. Dairy farming is picking up very fast in urban areas of Karnal and Hisar. Other than the comm-

Table 1. State-wise share of urban bovine and urban female in total bovine population

Category	State	Share of urban bovine in total bovine population (%)	Share of urban female in total bovine population (%)
	Chandigarh	65.83	58.47
	Manipur	11.08	7.77
	Tamil Nadu	10.45	8.80
	Dadra & Nagar Haveli	10.36	2.24
Large urban bovine population	Goa	8.99	2.24
	Nagaland	7.92	5.37
	Haryana	7.22	6.07
	Daman & Diu	6.41	5.19
	Punjab	5.04	4.47
	Gujarat	4.72	4.09
	Chhattisgarh	4.51	3.03
	Uttar Pradesh	4.30	3.66
Medium urban bovine population	Jammu & Kashmir	4.08	2.24
	Madhya Pradesh	3.93	3.14
	Karnataka	3.77	2.24
	Rajasthan	3.41	2.94
	Bihar	3.30	2.83
	Tripura	3.25	2.81
	West Bengal	3.09	2.54
	Arunachal Pradesh	2.93	2.02
	Odisha	2.67	1.94
	Andhra Pradesh	2.64	2.24
	Himachal Pradesh	2.64	0.72
	Jharkhand	2.64	2.04
Low urban bovine population	Kerala	2.64	5.66
	Maharashtra	2.64	2.90
	Mizoram	2.64	15.39
	NCT of Delhi	2.64	2.65
	Puducherry	2.64	16.98
	Sikkim	2.64	0.53
	Uttarakhand	2.44	2.08
	Andaman & Nicobar islands	1.71	1.50
	Assam	1.23	0.94
	Meghalaya	0.20	0.13
	Lakshadweep	0.00	0.00

Source: Worked out based on 19th livestock census report 2012, DADF, GOI

-ercial dairy farmers, small scale urban dairy farmers and gaushalas tend to experience number of difficulties in accessing the quality fodder. Hence, fodder entrepreneurs who emerged to utilize this economic opportunity are proving to be highly useful to these dairy farmers. There is not much information about facilitative role of these entrepreneurs who operate in select locations of such urban areas.

***Data collection procedure*:** A semi-structured interview schedule was developed to study their role and functio--ning in order to generate useful inputs for policy formulation. All the available entrepreneurs in Karnal (30) and Hisar (26) were considered as samples for this study as it was easy to contact all of them due to their presence in certain pockets of both the cities and to generalize the findings reasonably. In order to understand the urban share of livestock population, further analysis of 19th livestock census data was carried out. Data were gathered in the month of May and June 2015 and appropriate statistical tools were employed to analyze and interpret the findings.

Results and Discussion

Macro level analysis of urban dairy livestock: The bovine data based on 19th livestock census was grouped into three categories *viz*, large, medium and low urban bovine population states and union territories. This revealed that the share of urban bovine population to total bovine population was found to vary widely across the states and union territories between 11.08 per cent in Manipur and 0.20 per cent in Meghalaya. However, urban bovine population was found to be 65.83 per cent in Chandigarh (Table 1).

It was observed that overall trend of bovine population (including crossbred and indigenous cattle and buffalos) in the urban areas is decreasing (Table 2). But the critical analysis of productive crossbred cattle *i.e*. milch cattle showed positive trend (3.46 % and 7.02 % increase in in-milk and dry crossbred cattle, respectively during 2007 to 2012). It indicated the dairy farming in the urban areas is gaining importance with the ambition of marketing milk by keeping productive high yielding animals. These urban farms make available fresh milk to meet the demand of urban consumers. Further this trend is likely to increase due to urbanization process and its consequential impact on livelihood of urban dairy producers.

***Socio personal profile of urban fodder entrepreneurs*:** Forty per cent of entrepreneurs belonged to young category and only one-sixth (16.67%) of them were above 50 years old in Karnal while almost three-fifth of them (57.70%) belonged to middle age in Hisar (Table 3). This indicated that the youth can be properly channelized to promote entrepreneurships in fodder business. Fodder entrepreneurship is still considered as male bastion in both the cities as females are yet to get involved in nitty gritties of business including visiting auction centre for bargaining, transporting fodder to retail shop, fodder chaffing and packing in bags, collecting money if credit sale is made and management of labour. Almost two-third (63.33%) of respondents in Karnal and half of them

Table 2. Comparison of percentage variations in the cattle population in rural and urban areas during 2003-2007 & 2007-2012.

Species	% Change 2003-2007			% Change 2007-2012		
	Rural	Urban	Total	Rural	Urban	Total
Cattle						
Exotic/Crossbred						
Male	41.70	9.31	38.40	-11.48	-27.06	-12.75
Female						
In Milk	33.60	12.40	31.10	36.95	3.46	33.49
Dry	24.10	-5.90	20.90	41.50	7.02	38.57
Milch (in milk + dry)	31.01	7.78	28.28	38.13	4.24	34.79
Total Female	35.20	13.80	32.80	32.14	-2.42	28.78
Total Exotic/Crossbred	36.50	13.00	33.90	22.98	-6.83	20.18
Indigenous						
Male	0.10	-32.10	-1.00	-18.81	-40.37	-19.32
Female						
In Milk	11.60	2.50	11.10	-2.32	-23.50	-3.38
Dry	-9.00	-26.40	-9.70	7.00	-8.25	6.45
Milch (in milk + dry)	3.08	-7.97	2.53	1.08	-19.10	0.17
Total Female	8.30	-6.40	7.60	0.78	-17.40	-0.01
Total Indigenous	4.30	-16.40	3.40	-8.39	-24.65	-8.94
Total Cattle	8.34	-7.90	7.50	-3.45	-18.34	-4.10
Buffalo						
Male	1.05	-8.70	9.60	-17.37	-28.37	-17.83
Female						
In Milk	8.00	-6.50	7.00	3.49	-10.53	2.61
Dry	-5.30	-26.10	-6.50	12.37	-9.11	11.41
Milch (in milk + dry)	4.04	-11.38	3.00	5.90	-10.24	4.96
Total Female	8.30	-9.60	7.10	9.17	-12.74	7.99
Total Buffalo	8.70	-9.50	7.60	4.18	-15.11	3.19

Source: Adapted from 19th livestock census report 2012, DADF, GOI

in Hisar studied upto metric and surprisingly, more than one fourth (26.67% in Karnal and 34.62% in Hisar) of them were also graduates which showed that level of education is not a deterrent in undertaking this fodder business. Half of the respondents maintained medium family size where it is possible to identify the involvement of other family members in the fodder business followed by 47 per cent (Karnal) and 34.62 per cent (Hisar) in small size of family. Significant number of entrepreneurs (40%) possessed experience in fodder business upto 5 years which indicated that many entrepreneurs were recently attracted in this business in Karnal while respondents had longer experience in Hisar. Almost one-third of respondents (33.33%) had the previous job experience in farming and 56.67 per cent had come from diverse occupational background before taking up fodder as an entrepreneurial venture in Karnal. However, respondents from Hisar (53.85%) had diverse backgrounds of experience before entering into fodder business.

***Factors considered in establishment and running of fodder business*:** The study showed that majority of the respondents (56.67 %) in Karnal and one-third (30.77%) in Hisar preferred to choose fodder marketing due to non availability of productive employment opportunity (Table 4). One-fifth (20%) of respondents in Karnal and 38.46 per cent in Hisar undertook this venture as a self employ-

Table 3. Socio personal profile of urban fodder entrepreneurs

Variables	Categories	Karnal (n=30)		Hisar (n=26)	
		Frequency	%	Frequency	%
Age (years)	Young (upto 35)	12	40.00	6	23.08
	Middle (36-50)	13	43.33	15	57.70
	Old (51 & above)	5	16.67	5	19.22
Sex	Male	30	100.00	26	100.00
	Female	0	0.00	0	0.00
Education	Illiterate	3	10.00	4	15.39
	Primary	0	0.00	7	26.92
	Matriculate	19	63.33	13	50.00
	Graduate	8	26.67	9	34.62
Family size	Small (upto 4)	14	47.66	9	34.62
	Medium (5-9)	15	50.00	14	53.85
	Large (10 & above)	1	3.33	3	11.54
Experience (years)	Low (upto 5)	12	40.00	5	19.23
	Medium (6-20)	10	33.33	12	46.15
	High (above 20)	8	26.67	9	34.62
Previously occupied business	Agriculture	10	33.33	12	46.15
	Labour	0	0.00	0	0.00
	Business	3	10.00	0	0.00
	Others	17	56.67	14	53.85

Table 4. Establishment and running of fodder business

Variables	Categories	Karnal (n=30)		Hisar (n=26)	
		F	%	F	%
Motivation to undertake fodder marketing venture	Self employment	6	20.00	10	38.46
	Poor job satisfaction from old job	5	16.67	5	19.23
	Unemployment	17	56.67	8	30.77
	Others	2	6.67	3	11.54
Basis for selection of location	Own residence	0	0.00	0	0.00
	Low rented shop	1	3.33	0	0.00
	Availability of local customers	29	96.67	26	100
	Fodder Auction Centre	30	100.00	0	0.00
Place of purchase	Farmers	0	0.00	26	100.00
	Own shop	18	60.00	2	7.61
Place of sale	Rented shop	12	40.00	24	92.31

-ment option while one-sixth (16.67%) took up the same in Karnal due to lack of job satisfaction in their previous job. The entrepreneurs predominantly in Karnal (96.67%) and Hisar (100%) located their business unit by considering the availability of large number of local customers. As majority of entrepreneurs did not possess land, none of them were engaged in the fodder cultivation and they tend to purchase fodder from the Fodder Auction Centre situated in Karnal town. Farmers from the periphery of 25 to 30 km around the Karnal town were found to bring the fodder such as maize, sorghum, berseem and oat to this market and sell it by auction. After purchasing, entrepreneurs take the fodder to their shops in the town for further retail sale to the farmer clients. The entrepreneur in Hisar directly purchase the fodder from farmers from the periphery of 20 to 25 km using their labour and mode of transport as there is no availability of auctioning centre in the city. Most of the fodder shops (90%) were situated in short to medium distance *i.e.*, upto 4 km from Fodder Auction Centre. Majority of the respondents were full time entrepreneurs who usually open their shop at 8 am and close by 7 pm. Three-fifth of entrepreneurs were found to sell fodder in their own shop, while others sell in rented shops in Karnal, while majority of them (92.31%) sell their fodder in rented shops in Hisar.

***Fodder marketing pattern of entrepreneurs*:** The marketing of the fodder in the auction centre of Karnal is done by open auction method. The fodder is mainly transported by tractors (96.67%) from place of production to auction centre as it is found easy for loading and unloading. The transportation upto retailer shop is the responsibility of farmers and it is done by the same

Table 5. Marketing pattern of fodder

Variables	Categories	Karnal (n=30)		Hisar (n=26)	
		F	%	F	%
Transportation of fodder	By farmer	30	100	0	00
	By entrepreneur	0	0	26	100
Fodder cultivation in own field	Yes	0	0.00	1	3.85
	No	30	100.00	25	96.15
Direct linkage with farmers	No linkage	30	100.00	0	0.00
	Upto 10	-	-	8	30.77
	11-20	-	-	8	30.77
	>20	-	-	10	38.46
Regularity of customers pattern	Fixed	2	6.67	0	0.00
	Varied	5	16.67	1	3.85
	Both	23	76.66	25	96.15
Mode of purchase of fodder	Cash	30	100.00	4	15.38
	Credit	0	0.00	17	65.38
	Both	0	0.00	5	19.23
Mode of sale	Cash	3	10.00	0	00.00
	Credit	0	0.00	4	15.38
	Both	27	90.00	22	84.62
Engagement of hired labour in fodder shop (in numbers)	No labour	3	10.00	3	11.54
	Upto 1	2	6.67	5	19.23
	2-3	24	80.00	14	53.85
	4 and above	1	3.33	4	15.38
	Upto 500	11	36.67	11	42.31
Fodder sold/day (in kg)	501-1000	19	63.33	13	50.00
	>1000	0	00.00	2	7.69

F = Frequency

Table 6. Seasonal supply of fodder in Auction Centre

Season	Green fodder crops	Dry fodder
Kharif	Jowar (70%) & Maize (30%)	Wheat straw
Rabi	Berseem (70%) & Oat (30%)	Paddy and wheat straw
Summer	Berseem (90%) & Maize (10%)	Wheat straw

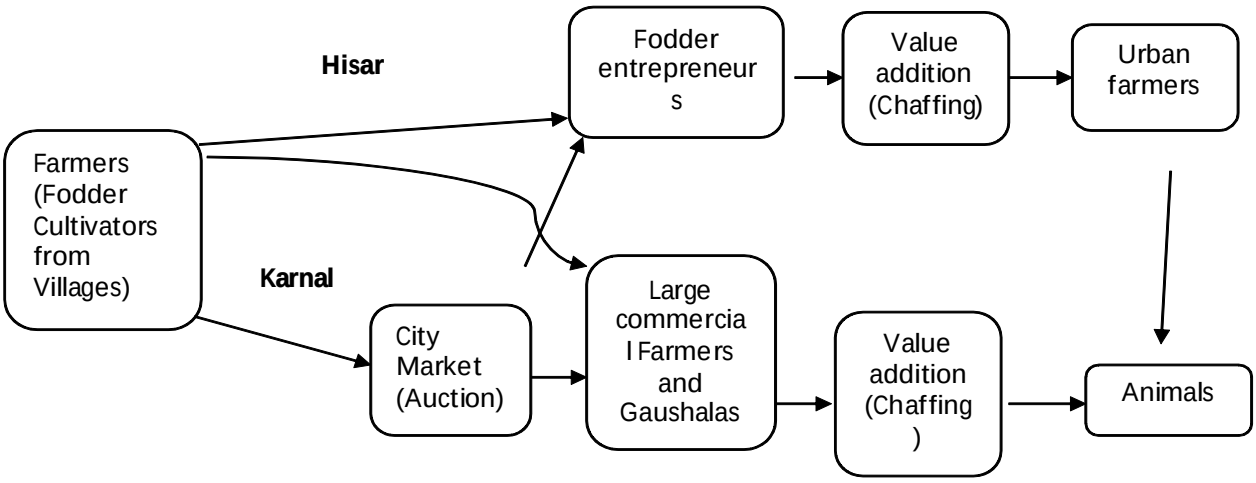

Fig 1. Fodder supply chain in urban area of Karnal and Hisar

vehicle used by farmers to carry fodder in the market. However, entrepreneurs directly purchase the fodder from farmers in Hisar by arranging vehicles on their own. They usually maintain the contact and contract with more than ten farmers in order to get the fodder regularly. The direct linkage between the farmers and entrepreneurs was not found in Karnal because of seasonal fluctuation in the prices which made difficult to deal price contract between them. From the experiences of entrepreneurs it was found that when fodder rates are high, farmers break the contract and sell their fodder in the auction for more profit. All the entrepreneurs were found to purchase fodder from the auction centre only in cash. While selling the fodder in retail, most of the entrepreneurs (90%) in Karnal and Hisar (84.62%) were found to sell by both credit and cash (Table 5). This might be to attract the customers and remain in the competition with other fodder entrepreneurs in the locality. As most of the activities in this business involve labour activities, the entrepreneurs (80%) employed 2-3 hired labours in the fodder shop for transportation, loading and unloading of fodder, fodder chaffing and packing in bags. Majority of the entrepreneurs in Karnal (63.33%) and Hisar (50%) had average monthly sale ranging from 501 to 1000 qt followed by upto 500 qt in both the places.

The analysis of the seasonal supply of fodder crops in main market shows that during the *kharif* season (July-October), out of total supply of green fodder, 70% consist of jowar and 30 % was maize (Table 6). In *Rabi* (November-February), share of berseem in total supply was more (70%) and remaining 30% was oat. During summer, market was dominated by berseem (90%) with small quantity of maize (10%).

In case of supply of dry fodder wheat straw was found throughout the year while paddy was found during the small period of winter *i.e*. December and January after harvesting of paddy. As the area under the wheat is more in the Haryana so the supply of wheat straw was found throughout the year. The supply of the fodder in the market by the farmers in the city is channelized in two ways *viz.* fodder entrepreneurs or retailers, and large commercial farmers & *Gaushalas* (Fig 1). In the first channel, the fodder brought by the farmers is purchased by fodder entrepreneurs who again sell the fodder after value addition i.e. chaffing to the small scale dairy farmers in the urban areas. This chain is established because the small scale dairy farmers cannot purchase from the auction centre as their requirement is low, lack of space for storage and non-availability of chaffing equipments. Around 30 such fodder entrepreneurs effectively utilized this opportunity in the Karnal city. In the second channel, large commercial farmers and *Gaushalas* take part in the auction and purchase the fodder in bulk as their daily requirement is high. There are six *gaushalas* (*i.e*. 3 each in city and peri urban location) in the Karnal district. Around 1800 cattle are reared in the three *gaushalas* namely*, Radha Krishna Gaushala* (650 cows), *Shri Krishna Gaushala* (850 cows) and *Madhuban Gaushala* (300 cows). This fodder market is contributing significantly in fulfilling the demand of fodder to these dairy animals reared by small as well as large commercial farmers and *Gaushalas.* Besides it provides good entrepreneurial opportunity for the self employment to the unemployed urban youth. Thus the following three major marketing channels were found for disposal of fodder.

Table 7. Constraints faced by the entrepreneurs in fodder enterprises

Constraints	Karnal		Hisar	
	Frequency	%	Frequency	%
Poor quality of fodder during unseasonal rainfall	17	56.67	14	53.85
Lack of space for storage	14	46.67	11	42.31
Shortage of fodder supply during summer in market	21	70.00	22	84.62
Daily fluctuation in supply and price of the fodder	22	73.33	16	61.54
Delayed payment by clients and non-payment of credit due	18	60.00	17	65.38
Loss of weight of green fodder during summer season at the time of sale	12	40.00	15	57.69
High cost of electricity for chaff cutter usage	8	26.67	9	34.62

Karnal

Channel-I: Producer- Commission agent- Urban dairy farmer

Channel-II: Producer- Commission agent-Fodder entrepreneurs- Urban Dairy Farmer

Hisar

Channel-III: Producer – Fodder entrepreneurs - Urban dairy farmer

Channel-IV: Producer – Urban dairy farmer

In Karnal city, two marketing channels namely channel I and II are operating. In channel I, the fodder is taken to the auction centre where the commission agent sells it to large urban dairy farmer on a competitive price in lieu of demand for fodder. The commission agent charges his commission from the producers. In channel II, the fodder entrepreneurs purchase the fodder from commission agent. He then performs several value added services like, chaffing, weighing, packing etc. before supplying to the urban dairy farmer. In Hisar, channel III and IV are operating. In channel III, the entrepreneurs purchased the fodder from farmers of the surrounding villages in the city periphery of 20 to 30 km. They also provide services like cutting, loading-unloading, chaffing, weighing and packing, and then supply the fodder to the urban dairy farmers. In the channel IV, the large urban dairy farmers purchase fodder directly from the producers and chaffed by own to serve their animals.

***Innovations followed by the entrepreneurs in fodder enterprises*:** Some of the innovations followed by entrepreneurs were door step delivery of fodder to customers, concessional rate of supply for regular and bulk purchasers and supply of fodder on credit basis. This strategy was to maintain the loyalty and trust with clients. All the entrepreneurs had invariably chaff cutter and provided the fodder after chaffing which is an important value addition. Although they purchase the fodder only by cash from main market, they were found to sell the same by both cash and credit at retail level. Now entrepreneurs need to think of year round fodder marketing through promotion of fodder bank including feed block, leaf meal and region specific mineral mixture (Hazra, 2014). Entrepreneurs can also pursue extension models like public private partnership model (Ponnusamy, 2013) and pashu sakhi model (Ponnusamy *et al*., 2017) for expanding their business in the urban areas.

***Constraints faced by the entrepreneurs in fodder enterprises*:** The entrepreneurs reported to receive poor quality of fodder during unseasonal rainfall which requires extension support to sensitize the farmers for proper harvesting of fodder (Table 7). It is necessary to improve storage systems on the farm, enroute to distance market and at retailer's level to address constraint related to storage facility. Marketing information system should be put in operation to enable the entrepreneur to access daily fluctuation in supply and price of the fodder. Entrepreneurs can also facilitate the farmers to get information and quality seed materials through veterinary officers and state agricultural universities (Rajanikath *et al*., 2015). Indeed, the entrepreneurs should be trained on scientific methods of marketing, storage and retailing.

Conclusion

Fodder entrepreneurship is emerging as an alternate employment provider in urban and peri-urban areas for substantial number of people. This study showed that there is a huge opportunity to utilize them for supply of quality fodder which will ultimately help to sustain the milk production. Urban and peri-urban dairy farmers are getting only limited number of high quality fodder varieties which probably due to non availability of seeds with farmers who supply the fodder in urban areas (Kumar *et al.,* 2015). Establishment of fodder museums and fodder warehousing in vicinity of urban, semi urban and producer organisations can enhance the awareness on scientific

fodder management including marketing. Establishing fodder banks will help to store surplus fodder/ grasses and use the same during deficit periods and areas, which in turn will boost fodder production in the potential areas.

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