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RESEARCH ARTICLE.....

Constraints affecting growth of dairying under mixed farming systems : Scientists perception

RACHNA, GAUTAM, **ANIKA MALIK AND** S. S. SANGWAN

ABSTRACT..... The future growth of agricultural production systems (including dairy) is likely to be knowledge intensive. Therefore, a continued support in the form of increasingly improved production technology will prove crucial to achieve higher productivity. Such support is possible only if sustained and focused efforts are made on research and development front. It is only logical to suggest here that a realistic appreciation of the constraints affecting the production systems on part of scientists will be vital to the development of improved technology. Ascertaining the constraint perception of the scientists about the factors affecting the growth of mixed dairy farming systems will be helpful in streamlining the research and development efforts. The study was conducted in Hisar district of Haryana state to document the constraints affecting the growth of mixed dairy farming systems. Thirty scientists working in the College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar were selected randomly by simple random sampling. Constraints like 'young generation does not like animal husbandry related work', 'non-availability of pasture and fellow land', 'non-availability of green fodder', 'farmers lack of knowledge about improved animal husbandry practices', 'high cost of animal feeds', etc were perceived as most serious by the scientists. On the other hand, items like 'there is perception that animals cause diseases', 'changing milk consumption patterns', 'more time is required for agriculture leaving less for animal husbandry', 'lack of market for dairy products' etc. were perceived as least serious.

KEY WORDS..... Constraints affecting growth, Dairying under mixed farming systems

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INTRODUCTION.....

Crop livestock farming systems constitute the dominant land use system in the developing countries (Iiyama *et al*., 2007). In these crop livestock systems, often referred to as mixed farming systems (Sere and Steinfeld, 1996), livestock and crops are produced within coordinated framework (Van Keulen and Schiere, 2004). Their importance in the state of Haryana can be realized from the fact that workers like Erenstein and Thorpe (2009) consider that mixed crop livestock farms sit at the core of the livelihood strategies of millions of predominantly resource poor families in the Indo-

Gangetic planes.

India is rich in agro-ecological diversity and concurrently one finds a range of unique livestock production systems that have evolved in each region in tune with the naturally available resources and needs of the people. This diversity begins with the choice of species reared, breeds that have evolved, management and feeding practices, healthcare systems that are closely linked to the natural flora and fauna, and local marketing systems. Mixed crop-livestock farming and pastoralism are the two common production systems found across rain fed agriculture zones. In the former, farmers derive their livelihood somewhat equally from agriculture and livestock; in the latter, people's livelihoods depend primarily upon their livestock, which are exclusively maintained on grazing.

With the unleashing of the demand driven livestock revolution, the chances are high that there will be alterations in the food and livelihood security of millions of poor farmers. The enlarged demand for animal-based foods is certainly having implications for livestock production systems and for livestock producers in poor rural areas that are trying to adapt to the changing social, economical, market and trade circumstances (Rao *et al*., 2005). Although the livestock revolution (Delgado *et al*., 1999) could mean income growth opportunities for many agricultural producers in developing countries, a key question is whether poor smallholders will be able to seize these opportunities. On a similar note, Khan and Bidabadi (2004) highlight the concern by suggesting that today the main question for India is whether the country will actively participate in the global livestock revolution, or whether it becomes only a prime receiver of changes in the international food market? Likewise, McDermott *et al*. (2010) contend that while a growing livestock sector can provide opportunities for the poor, there are deep concerns about the competitiveness and economic viability of poor producers in a rapidly changing livestock sector. Considering their significance on the livelihoods of the poor, proper understanding of the mixed crop livestock systems is critically important in order to devise appropriate technology transfer and institutional reforms for poverty alleviation, food security and sustainable resource management (McIntire *et al*., 1992; Pell 1999; Thornton and Herrero, 2001; Kristjanson and Thornton, 2004 and Herrero *et al.*, 2007).

RESEARCH METHODS.....

Thirty scientists working in the College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar were selected randomly by simple lottery method.

RESEARCH FINDINGS AND ANALYSIS.....

The results obtained from the present investigation as well as relevant discussion have been summarized under the following heads :

Background profile of scientists :

Majority of respondents were middle aged with mean age of about 44 years. The observed range of age was 31-58 years. The length of service of scientists was observed in range of 2-32 years, with a mean value of 16.3 years. Out of total 30 respondents, only seven were women indicating a poor gender ratio. Educational qualification of 26 respondents was upto doctorate level.

Constraints perceived by the scientists:

The scientists were given 60 statements in total. The possible range of constraint perception score was 60 to 180 and the observed range was 98-151. The mean score obtained was 120.82 and standard deviation 12.82. The respondents were classified into three categories based on the constraint perception scores in the Table 1. A large majority of the scientists were having low to moderate level of constraints perception.

The item-wise scores along-with their ranks have

Table 1 : Average constraint perception scores of scientists of different categories

Categories	Score range	Frequency (%)	Mean score + S.E	Average service length (years)	Gender ratio M:F
Low	98-114	12 (40)	108.16+1.54	16.7	9:3
Medium	115-133	13 (43.3)	123.15+1.6	15.4	11:2
High	134-151	5 (16.7)	140.40+2.85	18	3:2
Total	98-151	30 (100)	120.03+2.34	16.3	23:7

been depicted in the Table 2. As is evident, items like 'young generation does not like animal husbandry related work', 'non-availability of pasture and fellow land', 'non-availability of green fodder', 'farmers lack of knowledge about improved animal husbandry practices', 'high cost of animal feeds', etc were perceived as most serious by the scientists. On the other hand, items like 'there is perception that animals cause diseases', 'changing milk consumption patterns', 'more time is required for agriculture leaving less for animal husbandry', 'lack of market for dairy products' etc. were perceived as least serious.

Young generation does not like animal husbandry related work was perceived as most serious constraint affecting the growth of mixed dairy farming system. Livestock is an integral part of the mixed farming systems. The declining interest of rural youth in agriculture is directly related to existing poor physical amenities, socio-economic conditions and lack of enabling environment. Employment generation for youth is a major challenge not only in India but also in other developing countries. India has world's largest youth population and, therefore, country has greater challenge to provide employment opportunities to all.

Most of the agricultural extension programmes, which were implemented since independence in India traditionally, targeted the head of families for training and technology transfer. Young farmers often have greater capacity for innovation, imagination, initiative and entrepreneurship than older adults and these characteristics should be effectively harnessed by extension services to provide better livelihood opportunities for youth in agriculture. The investment on youth in agriculture is still minimal, as there are only a few youth focused programmes and thus, few clear examples of impact (Chander, 2013). India is losing more than 2,000 farmers every single day and that since 1991, the overall number of farmers has dropped by 15 million (Sainath, 2013). Over the past few years, rural youth have been shying away from agriculture (IFAD, 2012 and Paisley, 2013).

Due to decreasing land-holdings, animal husbandry takes the centre stage as means of their livelihood. This not only provides daily cash through the sale of milk, but also provides periodic income through the sale of heifers, breeding bulls, as well as surplus male calves. The scenario is even better for Haryana farmers since they are gifted with the world famous Murrah buffalo. Not only buffalo milk fetches higher price, but Murrah buffalo also command high premium over other breeds. Demand for animal food products is responsive to income changes, and is expected to increase in future. Prosperity is now more dependent on per capita livestock ownership than on agricultural farms.

There is a need to restructure service delivery mechanism to become conducive to the requirement of the young rural livestock producers. Lack of credit for livestock production has been a major problem. Public sector lending is abysmally very low. The commercial banks are not favourably disposed to providing credit to livestock farmers and the co-operative credit system is very weak resulting in excessive dependent of livestock farmers on informal sources usually at exorbitant interest rates. The strategy should be to correct these distortions and ensure timely availability of inputs and services including credit to livestock farmers. Proper incentives for their involvement in animal husbandry education, research and extension and by linking them to the expanding markets will have positive effects in attracting youth in livestock sector.

Non-availability of pasture and fellow land and Non availability of green fodder throughout the year were collectively considered as second most serious constraints. Generally, the feed and fodders for livestock are classified as roughages and concentrates, dry and fresh, as well as conventional and novel. Permanent pastures constitute 3.6 per cent of geographical area in the country. Their productivity and carrying capacity are declining, though these lands support grazing ruminants such as cattle, sheep and goats in large numbers. There are large chunks of common property and community lands which are under the public domain, but becoming drastically reduced for livestock grazing. According to the report of working group on animal husbandry and dairying for 11th Five Year Plan of the Planning Commission of India, the available fodder can meet the demand of only 46.7 per cent of livestock. Judging by the present requirements and availability of fodders, the deficits in terms of dry fodder, green fodder and concentrates are 11.20 per cent, 27.66 per cent and 34.45 per cent, respectively, which may persist and even aggravate unless adequate measures are undertaken to augment their resources (GOI, 2012).

Four main categories of feed resources are

Table 2 : Item-wise scores of the constraints perceived by scientists

Sr. No.	Constraints	Total score	Mean score	MPS	Rank
1.	Technologies disseminated to farmers are inappropriate	62	2.07	68.89	13
2.	Farmers do not adopt new technologies	66	2.20	73.33	9
3.	Farmers have a negative attitude towards adoption of new technology	63	2.10	70.00	12
4.	Market conditions are unfavorable for farmers	69	2.30	76.67	6
5.	There is low risk taking ability among the farmers	61	2.03	67.78	14
6.	There is lack of scientific approach in animal rearing	61	2.03	67.78	14
7.	Farmers lack of knowledge regarding improved animal husbandry practices	72	2.40	80.00	3
8.	There is lack of motivation among dairy farmers to improve production of their animals	60	2.00	66.67	15
9.	Mixed dairy farming is an unprofitable enterprise	50	1.67	55.56	23
10.	Farmers have poor mass media exposure	55	1.83	61.11	19
11.	Hardships involved in animal keeping are changing perception of farmers	56	1.87	62.22	18
12.	Expanding employment opportunities have resulted in lack of labor for animal keeping	59	1.97	65.56	16
13.	Milk consumption patterns have changed overtime, milk in large quantities is not required these days	44	1.47	48.89	26
14.	There is perception that animals cause diseases	36	1.20	40.00	27
15.	Illiteracy is a hindrance to animal management	57	1.90	63.33	17
16.	People are engaged in service /other occupation to meet up family requirements	59	1.97	65.56	16
17.	There is chronic shortage of feeds and fodders	71	2.37	78.89	4
18.	Young generation does not like animal husbandry related work	74	2.47	82.22	1
19.	Financial requirements of family are met by means other than mixed dairy farming	49	1.63	54.44	24
20.	Fragmentation of land holdings is a hindrance to mixed farming	61	2.03	67.78	14
21.	There is lack of irrigation facilities for fodder crops	62	2.07	68.89	13
22.	Shifting of cropping patterns has led to difficulties in animal keeping	53	1.77	58.89	21
23.	Farm mechanization is adversely affecting animal rearing in mixed systems	51	1.70	56.67	22
24.	Non-availability of high milk yielding breeds of animals is a problem	69	2.30	76.67	6
25.	There is frequent disease occurrence in animals	51	1.70	56.67	22
26.	Absence of market liberalization is adversely affecting the mixed dairy farming	56	1.87	62.22	18
27.	Research is not providing feasible solution to the problems of farmers	54	1.80	60.00	20
28.	There is lack of knowledge about balanced ration	68	2.27	75.56	7
29.	There is non-availability of pasture and fellow land	73	2.43	81.11	2
30.	Non availability of green fodder throughout the year	73	2.43	81.11	2
31.	Non availability of dry fodder	57	1.90	63.33	17
32.	High cost of animal feeds	72	2.40	80.00	3
33.	Non availability of seeds of high yielding varieties (H.Y.V.) of fodder crops	62	2.07	68.89	13
34.	Lack of clean drinking water sources for animals	55	1.83	61.11	19
35.	Input costs are increasing and it's very difficult to achieve profit	65	2.17	72.22	10
36.	There is lack of credit facility for dairy farmers	53	1.77	58.89	21
37.	There is lack of insurance facilities for animals	51	1.70	56.67	22
38.	There is non-availability of market for dairy products	49	1.63	54.44	24
39.	Transportation facilities to take produce to the market are poor	53	1.77	58.89	21
40.	There is lack of organized extension in the state	67	2.23	74.44	8
41.	The price of dairy products is un-remunerative	59	1.97	65.56	16

Table 2 : Contd.……..

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42.	There are high losses due to incidence of disease.	54	1.80	60.00	20
43.	More time is required for agriculture thus lack of time devoted to animal husbandry	47	1.57	52.22	25
44.	There is lack of space for animal premises.	55	1.83	61.11	19
45.	There is difficulty in management of animals during inclement weather conditions given the poor housing conditions.	61	2.03	67.78	14
46.	Non-availability of veterinary hospitals in villages.	51	1.70	56.67	22
47.	There is lack of doorstep veterinary health care services.	60	2.00	66.67	15
48.	Cost of treatment of sick animals is very high	64	2.13	71.11	11
49.	Vaccination is not done timely.	68	2.27	75.56	7
50.	Vaccination failure is a problem.	60	2.00	66.67	15
51.	There is lack of awareness regarding animal husbandry schemes.	63	2.10	70.00	12
52.	There is lack of training about animal husbandry.	60	2.00	66.67	15
53.	There is lack of gender sensitive training programmes.	57	1.90	63.33	17
54.	There is lack of good breeding bulls in villages.	70	2.33	77.78	5
55.	There is lack of A.I facilities in villages.	63	2.10	70.00	12
56.	Poor conception rates of A.I.	71	2.37	78.89	4
57.	Repeat breeding in buffaloes is a problem.	70	2.33	77.78	5
58.	There is a problem of abortion in animals.	59	1.97	65.56	16
59.	The performance of state animal husbandry department is not in keeping with the requirements.	60	2.00	66.67	15
60.	There is growing problem of infertility in animals.	70	2.33	77.78	5

potentially available for use in smallholder mixed farming systems – pastures, crop residues, cereals (concentrates) and non - conventional feed resources. Sustained efforts to improve the availability, while at the same time reducing the cost of all the three (except pastures), will have to be made in future. Scope for pasture land expansion is rather limited in Haryana state given the prevalent land use for intensive agriculture.

Many attempts have been made worldwide to look into the fodder scarcity challenge. Broadly, factors like limited and erratic rainfall, shrinking grazing lands due to competition for land for crops and changing land use patterns favouring urbanization and settlement, have been held responsible (Ayele *et al.*, 2012). On a micro scale, among other factors, poor adoption of fodder technologies has been attributed to farmers' limited knowledge of technologies and the low level of technical support provided to them, low government priority given to fodder compared to staple crop technologies and limited availability of fodder seeds (IFAD, 2006).

High cost of animal feeds was considered as the third most serious constraint. The problem is not absolute and is in part a reflection of the changing agricultural practices besides changing market dynamics. Firstly, the problem can be understood from the point of view of changing agricultural practices leading to decline in the availability of crop residues (such as wheat straws). The reduced availability has fuelled the prices of such feed stuffs in recent past. Secondly, over the last three decades there has been a marked shift in favour of concentrate feeding. Infact, it has been argued that the higher output growth in the Indian Dairy sector since 1980s owes much to the availability of concentrate to the otherwise poorly fed animals (Gautam *et al*., 2010). The share of cereal consumption in the livestock diets has been on rise worldwide. Doubts have earlier been raised on the ability to maintain a shift in favour of increasing concentrate use for animal feeding (Delgado *et al*., 1999). Thus, farmers have to cope with decreasing availability and rising prices of both crop residues and concentrates.

Consequently, there is a tendency towards specialization in agriculture. This is increasingly leading to delinking of crop and animal husbandry. For example

Bernués and Herrero (2008) reported that limited availability of land seemed to drive intensification through use of concentrates, cut and carry pastures and specialized dairy breeds.

In the meantime, efforts to improve crop residues availability by encouraging such crops as may yield higher residues, changing crop rotation to facilitate fodder production, improving unconventional feed utilization, etc may be thought of Recognition of the problem by the research and development system should make way for development of such production technologies that are favourable to mixed farming.

Farmer's lack of knowledge regarding improved animal husbandry practices was also considered as third most serious constraint along with high cost of feed and fodder. Whereas public extension played a major role in technology and knowledge transfer in the crop sector, in the livestock sector the concept of extension service delivery has been very weak. Despite its growing importance, livestock extension is a field neglected both by policy makers and by researchers. It continues to be a part of overall agricultural extension system.

Agricultural extension services have developed around crop production and remain tied largely to the seasonal nature of cropping. Such system is less useful for livestock production, with a longer time-scale and a lack of synchronization of different animals and herds. The National Sample Survey Organization (NSSO) in its survey of 55000 farmers households conducted during 2003-04 found that only 5 per cent of the households were able to access any information on animal husbandry against 40 per cent of households accessing information on modern technology for crop farming (NSSO, 2005). Moreover, livestock farmers sought information largely from private rather than public sources for information relating to livestock production. The NSSO survey reveals that public sector extension services are not the preferred option for accessing information on modern technologies on livestock production.

It is high time to restructure and revitalize the present institutional set-up in the livestock sector, enhance institution-level efficiency and pro-mote new institutional models to handle the emerging challenges in livestock sector development. The efforts should aim to promote and nurture the grass root level participatory bodies all over the state as the organic link between the animal husbandry department and the small holders. It should also encourage and promote adoption of appropriate technologies,enhance productivity, increase effectiveness, and ensure returns proportional to the investment of time, energy and resources that small holders, particularly women, make for livestock development and management.

This is a healthy sign that the workers of the technology generation systems (or R and D system) realize the problems faced by the farmers. This will help them streamline their efforts towards realistic problems, which in turn will lead to greater technology adoption. However, the things in actual practice are not so straight forward. It has been opined earlier that although the majority of dairy farmers in India are smallholders, the research systems are tilted in favour of intensive production systems (Gautam *et al*., 2010). Devendra (2000) believes that the technological requirements of majority of dairy farmers can at best be partially served by modern research tools currently in use. He further suggests that there is an overriding need for a farming systems perspective to the research agendas that involves inter-disciplinary and community-based participation. Such an approach will be more complex, require concentrated effort and more efficient resource use, but will be associated with considerable benefits due to a greater integration of effort. Rao (2006) argues that incorporating the crop livestock systems perspective into research policy, design and management will also require important organizational changes in India's National Agricultural Research system. While some of these changes will require significant increases in financial investments, others will require basic changes in governance systems and in individual attitudes and behaviour. Likewise, Sere *et al*. (2008) observed that the progress in improving the sustainable productivity of crop livestock mixed farming systems has been much more limited and is a significant research challenge. It is suggested that there is a need to relook at research and development issues for supporting the mixed dairy farming systems for enhanced role in near future.

Conclusion:

The scientists considered items like young generation does not like animal husbandry, non-availability of pasture and fellow land, non-availability of green fodder, farmers lack of knowledge regarding improved animal husbandry practices and high cost of

animal feeds, etc as most serious. On the other hand, items like there is perception that animals cause diseases, milk consumption patterns have changed overtime, milk in large quantities is not required these days, more time is required for agriculture thus, lack of time for animal husbandry, non-availability of market for dairy products, financial requirements of family are met by means other than mixed dairy farming, etc as least serious. The extent to which growth in livestock production can be accelerated would depend on how technology, institutions and policies address constraints facing the livestock sector. In the past, growth in livestock production was largely number-driven. This may not sustain in the long run and may stress the resources. The future growth should come from improvements in productivity. This will require overcoming feed and fodder scarcity and improvements in delivery of animal health and breeding services. Technology will be a key driver of growth and concerted efforts will be needed to generate and disseminate yield-enhancing and yield-saving technologies.

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