# Improvement of Livestock Sector in Rainfed Areas – Status and Strategies

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## Introduction

Indian agriculture is characterized by crop production under different agro climatic regions varying from arid to temperate agro eco zones. Rainfed agro-eco system occupies a significant place in Indian agriculture covering about 66 per cent of the net cultivated area, supporting 40 per cent of the country's population and contributing 44 per cent to the food basket. Livestock rearing has been an integral part of agriculture in the rainfed agro eco system and is a major source of livelihood and income to majority of resource poor farmers of the region. In spite of the fact that the rainfed area is endowed with large numbers of different species of livestock and also a good amount of feed resources, the productivity of the livestock is comparatively very low and as such the farmers are not finding animal rearing a remunerative proposition. Focused attention is needed for comprehensive livestock development in rainfed areas of the country, which would go a long way in providing the landless and small farmers an assured source of income. Moreover, looking into the overall growth of the livestock sector in the country and the projected targets to be achieved for milk, meat, wool and eggs by the year 2020, it is imperative that the contribution from rainfed areas to the national pool has to be substantially increased. In the present paper, current livestock and feed resource availability scenario is summarized and strategies for overall livestock development in the region are discussed.

## Prevailing Livestock Scenario

Looking into the total population of important livestock species across various agro eco regions (table 1), it is evident that rainfed production system accounts for the maximum livestock population. Rainfed system alone accounts for 47 per cent cattle, 42 per cent buffalo, 54 per cent sheep, 43 per cent goats, 28 per cent pigs and 44 per cent poultry. Next to rainfed, irrigated production system is a major production system

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accounting for 26 per cent cattle, 41 per cent buffalo, 30 per cent goats, 28 per cent pigs and 18 per cent poultry. Unlike other agro eco systems, all types of livestock production systems, whether it is large ruminants (cattle and buffalo), small ruminants (sheep & goat), piggery or poultry occupy equal importance in the rainfed system, which is distinctively advantageous for the overall development of livestock in the region.

**Table 1. Livestock Population in different Agro Climatic Zones (million heads)**

| | Cattle | Buffalo | Sheep | Goat | Pigs | Poultry |
|---|---|---|---|---|---|---|
| Arid | 6.23 | 4.98 | 7.26 | 9.90 | 0.17 | 1.04 |
| Coastal | 18.83 | 6.40 | 10.91 | 10.71 | 0.98 | 119.88 |
| Irrigated | 47.45 | 41.07 | 4.21 | 36.46 | 3.85 | 80.53 |
| **Rainfed** | **82.41** | **40.20** | **31.95** | **53.07** | **3.83** | **196.48** |
| Hill & mountain | 21.76 | 3.95 | 4.90 | 11.40 | 4.68 | 44.00 |
| Island | 0.07 | 0.02 | 0.00 | 0.11 | 0.05 | 0.99 |
| **Total** | **176.75** | **96.62** | **59.23** | **121.65** | **13.58** | **442.91** |

Keeping with the trend at the national level, even in rainfed system, the cattle population predominates (67.22 per cent) over the buffalo population (32.78 per cent). However, the proportion of indigenous cattle, which are generally low producers, is higher in the rainfed region than the national average (table 2).

**Table 2: Cattle and Buffalo distribution (000 numbers)**

| | Crossbred | | | Indigenous | | | Buffalo | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| Arid | 41.06 | 287.96 | 329.02 | 1851.89 | 4050.01 | 5901.89 | 456.22 | 4522.48 | 4978.70 |
| Coastal | 929.27 | 4635.91 | 5565.17 | 6972.26 | 6291.73 | 13263.99 | 1343.25 | 5057.07 | 6400.32 |
| Irrigated | 1196.45 | 4609.06 | 5805.51 | 19553.33 | 22093.22 | 41646.55 | 7770.36 | 32295.52 | 40065.88 |
| Rainfed | 1652.95 | 6856.84 | 8509.79 | 38197.54 | 35703.03 | 73900.56 | 6697.68 | 33506.00 | 40203.68 |
| Hilly | 914.22 | 2630.05 | 3544.27 | 8964.52 | 9255.72 | 18220.24 | 733.32 | 3220.80 | 3954.12 |
| Island | 3.05 | 11.93 | 14.98 | 23.51 | 27.78 | 51.29 | 7.29 | 8.92 | 16.21 |
| India | 4737.00 | 19031.74 | 23768.74 | 72063.05 | 72921.48 | 152984.53 | 17008.13 | 78610.78 | 95618.91 |

Source: District wise livestock census 2003, DAHD, Govt. of India

Another characteristic feature of the region is the high proportion of male population over the female population among the indigenous cattle indicating that the farmers of the region still depend more on animal draft power for agricultural operations. Crossbred

cattle mainly reared for milk production accounts for about 10.32 per cent of the total cattle population in the region. However, the concentration of crossbred population is restricted to specific pockets of the region.

**Availability of Feed Resources**

Contrary to the expectations, there has been a constant increase in the overall feed resource at the national level over the years and the feed resource availability has increased from 347.91 million tones in 1980-81 to the present level of 906.76 million tones. Of the total livestock feed resources potentially available in the country rainfed agro eco region accounts for little over 45% (table 3).

**Table 3: Availability of Feed Resources across different regions**

(Million tones)

| Ecosystem | Dry fodder | Concentrates | Greens | Total Feed Resource |
|---|---|---|---|---|
| Arid | 9.77 | 2.01 | 59.60 | 71.38 |
| Coastal | 21.82 | 1.62 | 37.24 | 60.68 |
| Irrigated | 155.44 | 11.31 | 35.16 | 201.91 |
| Rainfed | 155.20 | 17.97 | 237.32 | 410.49 |
| Hilly & Mountain | 23.56 | 1.54 | 133.36 | 158.46 |
| Island | 0.04 | 0.009 | 3.80 | 3.84 |
| **All India** | **365.82** | **34.46** | **506.48** | **906.76** |

Source: Feed base 2003, NIANP, Bangalore

At the national level, crop residues continue to be the major feed resource in rainfed eco system and this situation is not expected to change dramatically in the near future. Rainfed eco system is characterized by cultivation of a variety of cereal, pulse and oilseed crops by the farmers, which could be mainly ascribed to the reason that farmers take up the cultivation of different crops based upon the rainfall pattern and dependency on a basket of crops reduces the margin of risk. Consequently, a variety of crop residues are available in the region for feeding of livestock. Nutritionally poor coarse straws from jowar, bajra and maize are predominantly available for feeding of livestock especially in the states of Maharashtra, Andhra Pradesh and Karnataka. Even though a considerable quantum of sugarcane tops are available in the region, full exploitation of this resource for feeding of livestock has not been done.

Fifty per cent of the 34.5 million tonnes of concentrate ingredients available at the national level are contributed from the rainfed area. Although quantitatively they account for the least, concentrates have a major role in fulfilling the nutrient requirements of

productive animals. About 75 % of the total oil cakes are available from the rainfed agro eco system. The major oil cakes available in this region are groundnut, soya cake, sunflower and mustard cake. Even though the rainfed region is endowed with substantial quantities of nutritionally rich concentrate ingredients, they are not available to the livestock within the region due to considerable movement of these ingredients to other regions.

The overall situation prevailing in this eco system is of high feed resource availability and medium productivity. The DM availability for the livestock in this region works out to be 5.45 Kg/ACU/day. The low livestock productivity in the region could be due to comparatively larger population of indigenous cattle and less importance given to buffalo production. Considerable scope exists in the region for bringing about improvement in the livestock sector and increasing the productivity of the animals thereby improving the economic status of the farmers. For achieving this objective concerted and focused strategies, which are specific to the region are to be developed and implemented effectively. Any improvement achieved in the region would significantly contribute to the overall improvement at the national level.

**Livestock Developmental Strategy for the Region**

A development strategy for rainfed area is a challenge facing all those involved in planning and implementation. For such areas, the scope for increasing production from crops is limited and the contribution of livestock to total production and as a source of employment is high. There is lack of a clear strategy for a balanced approach to sustainable development. A major constraint in the rainfed, semi-arid and arid areas is the lack of strong forward and backward linkages. The strategies to be developed and implemented should encompass the whole eco system and may cut across state boundaries.

**Characteristics of Farmers in Rainfed Area**

Majority of the farmers in rainfed eco system are involved in livestock rearing activity and for landless and small farmers, this activity is the major subsistence occupation. In relation to livestock activity, the major characteristics of farmers in the region could be summarized as under

- Each farmer owns at least one or two cattle heads
- Livestock is of low genetic potential and low productivity
- Inability to provide quality feeds for increasing productivity of animals
- Resource crunch in terms of adequate feed resources, higher investment capacity
- Lack of awareness on scientific methods of livestock feeding and management

**Delivery Systems for Technological Transfer to Rainfed Farmers**

The centralized system of extension services has very limited penetration in rainfed eco system, where the population is well spread out and communication is difficult. A different approach involving the rural families is called for. Some of the issues pertaining to technology transfer are

- Livestock extension activities have not developed to the level as in agricultural extension
- Lack of research on production systems under unfavourable ecological conditions and in areas, which are less well endowed with natural resources.
- Need based and location-specific community programs, which promise to raise nutritional security, should be identified and effectively implemented

**Support Mechanism and Systems**

Looking into the unique features of rainfed eco system in terms of farmers profile, existing livestock system scenario and the ecological conditions, it is very essential to have a strong and specific support mechanism and systems in place for overall improvement in livestock system in the region. Some of the major issues, which need to be considered are

- Credit system is normally available through different channels / schemes only for procurement of animals by the farmers.
- In the absence of any concrete support system for majority of farmers in terms of quality feeds, health coverage, artificial insemination etc. the productivity of the animals cannot be sustained
- An adequate support mechanism is not in place for dissemination of technologies for proper feeding and management of livestock, in the absence of which, the full production potential of the animals is not exploited by the farmers resulting in low margins of profit or animal rearing itself becoming non-remunerative.
- No worthwhile system exists for supporting the farmer to maintain his livestock during natural calamities like drought and floods.
- There is lack of an adequate and remunerative marketing system for marketing of livestock products – more so in remote and not well developed areas.

**Constraints hindering Improvement of Production in Rainfed Areas**

There have been several constraints hindering the improvement of livestock development in the country as a whole but several issues are particular and more relevant to rainfed agro eco system. These are indicated below.

- There is lack of a defined policy for feed and fodder development. Lack of horizontal coordination between various departments is one of the major constraints. Low priority accorded by the agricultural department for fodder production and the protectionist approach by the forest department has resulted in stagnation of feed resource availability for livestock.
- With the focus and direction of the economic policies oriented towards export promotion, a shift in cropping pattern with more emphasis on cash crops like cotton etc is likely to happen, which would have a negative impact on the livestock feed balance.
- The Rainfed eco system is characterized by a host of livestock production systems – cattle and buffaloes for milk, sheep and goat for wool and meat, piggery and poultry. However, there is no clear understanding of the feed balance scenario at the macro level and the production systems at the micro level, which is very essential for focusing the attention on improvement of a particular production system specific to an area even within the rainfed eco system.
- The focus of research institutes located in rainfed areas is largely towards crop production systems and very little emphasis is given to livestock integration and development issues in the region.
- Field staff and extension personnel are comparatively better equipped technically in the areas of breeding and health than livestock nutrition and management, which is an important area for increasing productivity of animals and thereby ensuring higher returns.
- There are several constraints in terms of technical, organizational and other constraints for effective technological interventions related to feed and fodder development. These constraints need to be overcome with specific interventions.

**Interventions Needed in Rainfed Eco System**

A holistic approach is needed for development of the livestock sector in the rainfed areas, which would ensure improvement in the farmers overall economy. Rainfed system is characterized by availability of different livestock species, a varied basket of feed resources and there is considerable scope of increasing the productivity of the animals provided focused plans are drawn and implemented. Some of the interventions which need focus are

- Type of animal production systems to be encouraged in a particular area should depend upon the type of feed resources available and the geographical features. In areas where limited feed resources are available, small ruminant production

systems with sheep and goats should be focused. Dairy production systems should be encouraged where feed resource is not the primary limiting factor.

- Vertical integration of dairy production system along the lines of integrated poultry production system. There is considerable scope for vertical integration of dairy animals in rainfed areas. Large-scale integrators need to come forward to provide dairy animals to the farmers along with all other support systems and buy back the livestock products. This would provide a constant and substantial income to the farmers at low or no risk.
- Developing specific technologies for improvement in nutritive quality of crop residues. The livestock in rainfed area would continue to subsist mainly on crop residues and any cost effective technology developed to improve the nutritive quality would ensure efficient utilization of existing feed resources. Roughage based complete feed technology would be ideally suited for rainfed areas. Involvement of Self Help Groups and providing needed support system to these groups would effectively help in implementation of the technology in a successful manner.
- A specific and viable system has to be put in place for developing feed and fodder banks at strategic places in the rainfed eco system. This would go a long way in ensuring feed security to livestock during periods of feed scarcity and thereby ensure that precious animal resources are not lost for want of feed. This would also help in movement of feed resources from areas of surplus to areas of deficit within the region.
- The success of livestock sector improvement in rainfed region would depend considerably on developing and implementing an effective marketing system for livestock products in the absence of which the farmers would not find livestock rearing remunerative.

**Conclusion**

Development of agriculture in rainfed eco system cannot be thought of in isolation without concurrent development of livestock sector in the region. There is considerable scope for improving the production and productivity of animals in the region. Livestock sector should receive high priority with multiple objectives of diversifying agriculture, raising income and meeting the nutritional security of the poor farm households. Need based and location-specific programs, which promise to raise nutritional security, should be identified and effectively implemented.