

Agro-Economic Policy Briefs

Aiding the Future of India's Farmers and Agriculture



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For kind attention of:

The Hon'ble Prime Minister's Office,
the Ministry of Agriculture and Farmers' Welfare,
and all others interested

On Critical Policy Issues in India's Agricultural Economy

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Fodder Shortage in India: Need to Scale Up Fodder Seed Production through Dairy Cooperatives

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Introduction

- Fodder is an important component of animal ration as about 65-70 percent of the total cost of livestock farming is attributed to feeding. Therefore, its adequate availability is essential to exploit the genetic potential of the livestock. Evidences have indicated that feed related problems have accounted for about 36 percent loss (per annum in value terms) in dairy animals and losses due to scarcity of dry and green fodder were estimated to be 11.6 percent and 12.3 percent, respectively. Green fodder is the essential component of feeding animals to make them healthy and productive, particularly to obtain desired level of milk production. Scarcity of fodder is one of the most serious impediments in the way of sustainable livestock development as well as in doubling dairy farmers' income, as it has direct bearing on the income and livelihood of numerous resource poor livestock keepers.
- Mitigating scarcity of dry fodder and managing availability of green fodder round the year is a serious challenge for the livestock keepers as majority are marginal and small holders unable to produce and store livestock feed and forage facing acute shortage during certain periods. In the current scenario, where competing demands on land renders even expansion of food/cash crops a difficult proposition, the probability of increasing area under fodder crops is nearly impossible. It is therefore imminent to adopt a multi-pronged strategy for adequate availability of fodder in order to provide a buffer to the farmer even in times of climatic variability.
- One of the reasons for lower fodder yield and availability is lack of sufficient quantity of quality seed of high yielding improved varieties/hybrid. At present, seed replacement rate in fodder crops is less than 20 percent. Higher seed replacement rate is directly correlated with higher yield. The seed requirement for the probable fodder crop area in the country estimated by taking into consideration seed multiplication through standard seed chain, shows that the breeder seed is not being produced as per the requirement. The seed production for fodder crops face basic production problems of low Seed Multiplication Ratio (SMR) as the cultivated fodder varieties are not developed for seed. Regional fodder stations of the Department of Animal Husbandry and Dairying (DADF) reasonably produces foundation seeds of desired variety and supplies to states that fulfil their foundation seed needs for further multiplication and distribution of certified/quality seeds in the form of mini-kits. The seed production is around 500-600 tons annually in the form of foundation seeds. Thus, there is significant gap in availability and requirement of quality fodder seed. As per Indian Grassland and Fodder Research Institute (IGFRI), the actual breeder seed requirement is not being indented for seed production, the produced breeder seed is not being multiplied following seed chain, which is the most common problem even with food crops and the actual area under fodder crops needs to be included under agricultural statistics data collection.
- Cooperative sector in dairy production has played an important role in the development of the Indian dairy sector by linking village cooperative dairy producers with the markets and providing fair cost and quality inputs and services to the farmers. During last more than two and a half decades, the number of village dairy cooperatives has increased significantly from 13,284 in 1980-81 to 1,85,903 in 2017-18 with an increase in dairy members from 1.75 million to 16.57 million respectively. In view of the above, it is proposed to expand the existing fodder seed production and marketing programme to reduce the gap in the demand and supply of quality fodder seeds.
- In the past, National Dairy Development Board (NDDB) had assisted dairy cooperatives in establishing Fodder Seed Production and Marketing units. These units have adequate infrastructure for seed processing, treating, packing and storage along with dedicated technical manpower. Presently, these units are producing around 5000 Metric Tonnes (MT) of quality fodder seeds annually through their registered seed growers/milk producers under buy back arrangement. The seeds so produced are being marketed to the milk producers at a competitive price through dairy cooperative societies after thorough cleaning/processing, treating, packing and testing.
- NDDB is also organizing supply of breeder seeds of various fodder crops to dairy cooperatives through Indian Council of Agricultural Research (ICAR) and other Agricultural Universities. On similar lines, under National Dairy Plan – Phase I (NDP-I), activity

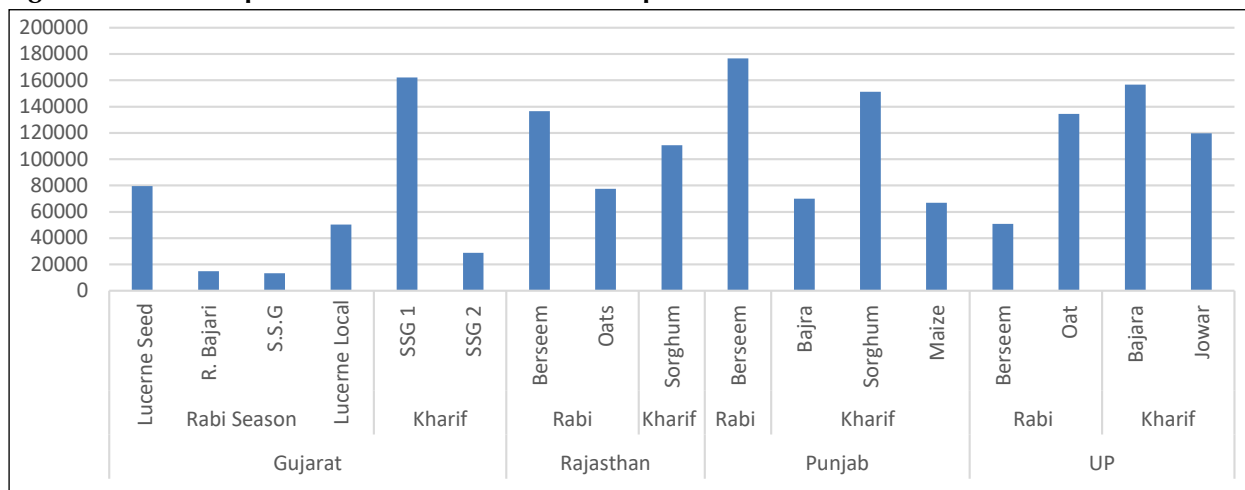
is expanded through establishing seven new seed processing units. During 2013-14 to 2018-19, under seed multiplication programme of NDP-I, total 12,105 MT of fodder seed was produced. However, even though the farmers wish to invest land under fodder production they face difficulty in getting good quality seed. Thus, there is an urgent need to undertake fodder seed multiplication programme through dairy milk unions in order to supply quality fodder crop seeds to the farmers at competitive price.

are produced scientifically always have higher sales price. Though under NDP-I, dairy cooperatives are procuring breeder/parent seeds of improved genetics from ICAR/Agricultural Universities and inducting it in seed multiplication chain, organizing multiplication from breeder to foundation and foundation to certified/truthfully labelled seeds, it may still not accomplish requirement of quality seed. The raw seeds are procured from seed growers after meeting minimum field standards, arranging its cleaning, grading, processing, treating and packaging at the fodder seed processing plant. Certified/ truthfully labelled fodder seeds are being made available to the dairy farmers through Dairy Cooperative Societies (DCS) at a competitive rate. Many farmers buying fodder seed do not wish to invest in purchasing high quality seeds of higher price due to significant difference in the rate between high and inferior quality of seeds. Many a times farmers even use grains as seeds in fodder crops due to its low price.

Findings

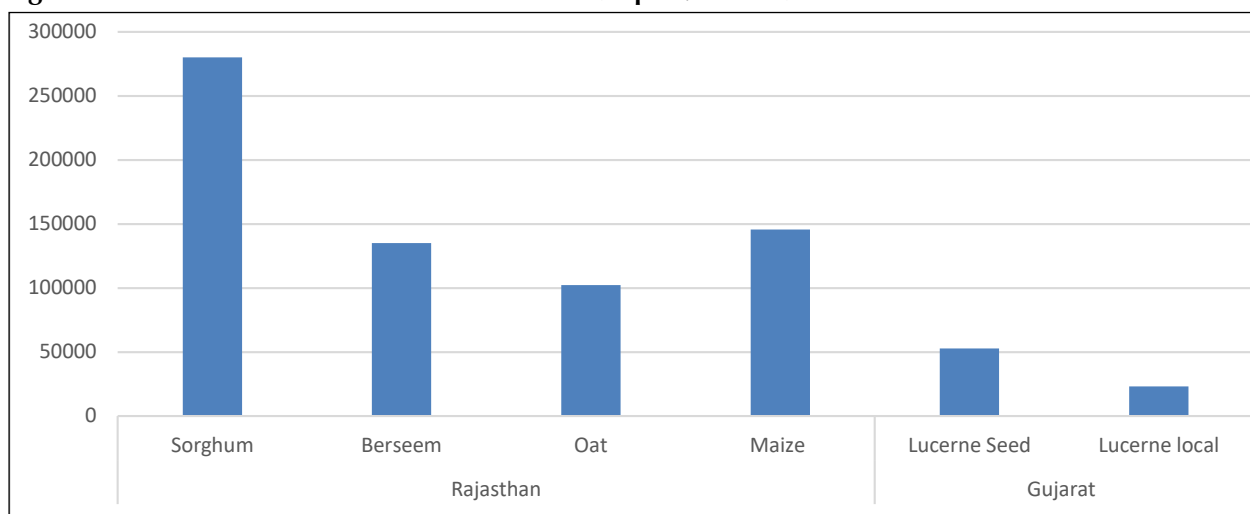
- The results of a recent ongoing study indicate that fodder seed production is economical and remunerative to the seed growers/producers as compared to competitive crop (Figures 1 & 2). Therefore, seed growers taking up fodder seed production need to be encouraged to take up seed multiplication. Moreover, certified/truthfully labelled fodder seeds of improved varieties which

Figure 1: Fodder Crop Cultivation - Estimated Profit (Rupees/hectare).



Source: Calculated by the Author.

Figure 2: Fodder Seed Production- Estimated Profit (Rupees/hectare).



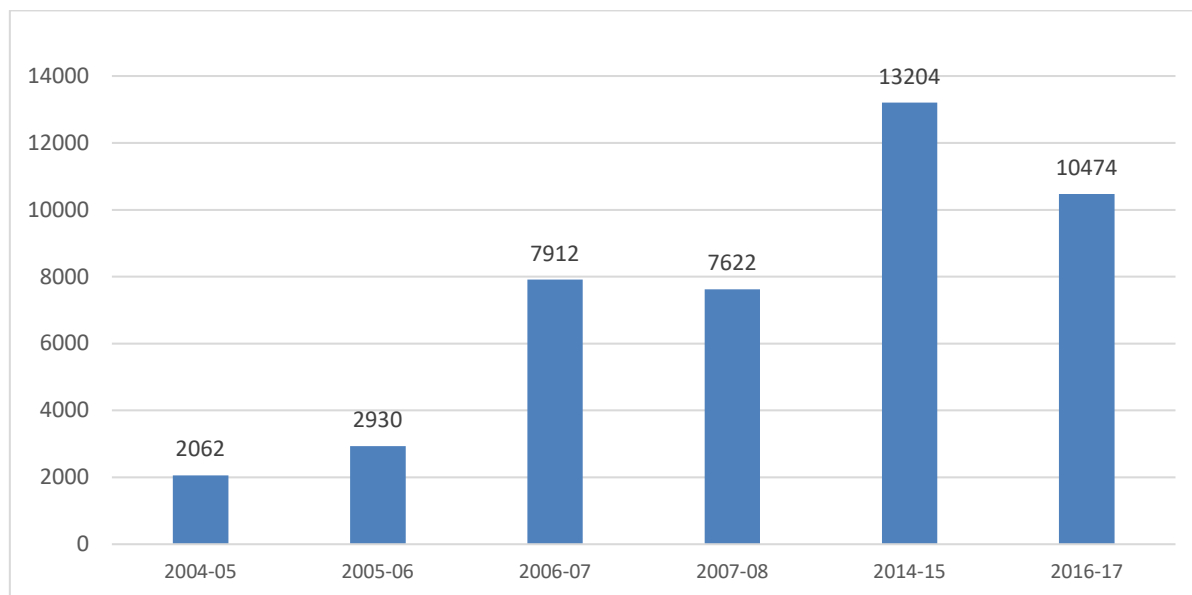
Note: Income was estimated by using imputed value, i.e., estimated market rate for produce.

Source: Calculated by the Author.

- Berseem, known as the king of fodder crops, is popular among livestock farmers and is mainly used as green fodder. The high digestibility (up to 65 percent) along with high palatability, good forage quality (20 percent crude protein) and long duration of green fodder availability (November-May) have made it the best kind of fodder. It is an important winter forage crop in India. The cultivation of berseem

crop is possible only in the irrigated regions due to its water requirement. Berseem is easy to grow and helps in improving the soil fertility. Berseem being a multi-cut nature crop, its fodder production ability is very high. A well-managed Berseem crop can give 45-50 tons/hectare of green fodder in three cuttings before leaving the crop for seed production. The average seed yield is 0.3-0.4 tons/hectare.

Figure 3: Import of Berseem Seed Variety i.e. Mescavi (MT).



Source: AERC Vallabh Vidyanagar, Anand.

Figure 4: Berseem Cultivation (left), Berseem Seeds (right).



Source: www.feedipedia.org; www.images-na.ssl-images-amazon.com

- The studies conducted by IGRI at farmer level in different villages of Jhansi clearly showed the profitability of Berseem seed production. The green fodder was harvested three times before leaving the crop for seed production. The average Benefit Cost Ratio (BCR) at farm was found to be 1.85. The benefit cost ratio calculated on variable cost basis was found to be 2.32. This BC ratio includes both the green fodder and seed as marketable commodities. Thus, if the farmers are able to sell the green fodder

initially and subsequently the seed, they will be benefitted much more than the regular food crops. A recent study conducted by Agro-Economic Research Centre, Vallabh Vidyanagar, indicates that the production of fodder seed is economical and remunerative to the seed growers/producers as compared to competitive crops having BC ratios on variable cost more than above estimates. During the last few years, an increase in the import of Berseem seed (Figure 3) has indicated serious concern on

availability of quality seed of fodder crops. Therefore, there is a need to provide support to in house production of seed of berseem so that we can boost the income of farmers through seed multiplication, sale and availability of fodder for dairy on one hand and save foreign exchange on the other.

Conclusions and Recommendations

- There is a lack of adequate and genuine data on production and availability of various types of fodder and feed grains. Therefore, competent agencies should be encouraged to generate real time and time-period data on fodder production, feed grain production and land availability for grassland and other pasture grounds.
- Quality seed production is an important area that needs to be strengthened for vertical growth in cultivated fodder. Multi-pronged strategic policy and research interventions are required to take care of all aspects of fodder seed production technology, quality, seed standards, certification, distribution and marketing.
- As such cultivation of fodder is profitable, but due to non-availability of organised market as well as less demand for the same, it is not getting momentum. Animals are either over or under fed. Therefore, there is a need to develop awareness among dairy owners about proper livestock feeding as well as about fodder cultivation.
- Fodder based cheaper feeding strategies are required to reduce the cost of production of quality livestock since feed alone constitutes around 70 percent of milk production costs. To meet the current level of demand by livestock and its annual growth in population, the deficit in all components of fodder, dry crop residues and feed, need to be met by either increasing productivity, utilising untapped feed resources, and increasing land under fodder cultivation.
- Efforts are required to increase area under fodder cultivation, especially through the use of barren and fallow lands and silviculture. Appropriate resources and technologies need to be made available to ensure quality fodder seed production. Fodder cultivation in degraded land and forest land need to

be taken wherever possible with the help of farming community. Round the year availability of quality fodder through promotion of hay, silage and fodder banks needs to be emphasised. Non-conventional sources of feed such as azolla, processed vegetables and fruits waste, need to be promoted.

- Plant breeders in India have also identified a number of varieties/hybrids which could give a better quality and higher yield of crop residue without any compromise in grain yield. This would provide an opportunity for augmenting the availability of fodder from crops like pearl millet, sorghum, maize and oat.
- While fertile lands with assured irrigation are diverted for growing high value crops, large stretches of marginal and wastelands are lying underutilized across the country. There are also opportunities to introduce fodder as an intercrop or as a soil binder under the watershed development programme. Most of the fodder varieties presently released for cultivation, are not the most ideal for cultivation on such lands with low productivity. Identification of suitable fodder species for such areas and developing suitable cultivation practices are necessary to boost fodder production on marginal and wastelands in the future.
- The role of institutions in fodder development especially district dairy cooperatives need to be strengthened and there should be a dedicated fodder officer to take up fodder development activity on a large scale.
- Implementation of fodder production under NDP-I would prove helpful in assuring that fodder and fodder seed production is given its due importance. The fact that fodder accounts for the single largest share of expenditure in dairy, any strategies associated with making dairy business profitable cannot afford to ignore incentivizing fodder development through various strategies.

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Paddy Fields in Kerala Regaining Normalcy: Some Post Flood Experiences

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Introduction

- Paddy is the most important food crop grown in Kerala and it accounts for 7.46 percent of the total cropped area in the state. The area under paddy has been falling at an alarming rate since the 1980s, mainly due to rapid urbanization in the state and conversion of paddy fields into commercial crop fields. Over the last four decades (1974-2016), area under paddy in the state has reduced from 8.82 lakh hectares to 1.96 lakh hectares. The production of paddy has also declined from 13.76 lakh MT to 5.49 lakh MT (1972-2016). Further, paddy productivity in the state is also very low (2790 kg/ha) as compared to China, which is the major producer of rice in the world (6744 kg/ha).
- The productivity of paddy in the state has shown only a marginal increase in the past four decades. Such a declining trend was further intensified by the floods last year. Paddy was one of the worst affected crops due to the flood. Almost whole of paddy fields in the districts of Alappuzha and Palakkad (leading districts in paddy production in the state) were submerged under water. It was highly anticipated that the sector will struggle for survival. However, things turned differently post flood, at least in the case of paddy. Post flood paddy cultivation has immensely benefited, mainly in terms of fertility of the soil and it is now reflecting in the record yields in the recent harvest seasons.
- Paddy cultivation in Kerala had always incurred losses for the farmers, compelling paddy farmers to look for alternate opportunities. Consecutively, large scale conversion of paddy fields into fields for commercial crops like rubber, spices and coconut became popular. Relatively limited seasonal vulnerability and long term nature of the crops were primary attraction for the large scale conversion. However, in the end, these commercial crops including rubber and coconut failed miserably in getting fair price to sustain their livelihood.
- However, paddy field yield in the state is gaining momentum after many years, especially after the floods of August 2018. This year marks an average yield of 3.5 tons per acre which is a very rare phenomenon. The normal average production per acre in the State is 2-2.5 tons. There are instances of farmers fetching a gross earning of Rs. 3 crores in

the year, solely from paddy cultivation in Kuttanad in Alappuzha. The reason behind this drastic change is two-fold, one is the improvement in soil health of the paddy fields due to the floods of 2018 and second is the formation of 'paddy estates' by combining the marginal paddy fields in the State.

Findings

- The devastating floods in August last year in the state had destroyed the agriculture sector completely. Both the crop and livestock losses were huge with an estimated loss of Rs. 5,623 crores in case of crops alone and paddy was one of the worst hit crops in the flood. However, the flood has brought in a lot of alluvium which is a deposit of clay, silt, and sand left by flowing floodwater in a river valley or delta, typically producing fertile soil. With a year of such fertile alluvium deposits in the paddy field, it has resulted in tremendous increase in the yields. Experts and senior farmers have opined that the alluvium took the fields to the level of fertility of soil around four to five decades ago.
- The idea of 'paddy estate' is not a new phenomenon. Attempts in this regard were made years ago and they have been largely referred to as 'group farming' or 'cluster farming'. The idea was that promoting large scale farming by pooling marginal fields (and farmers) will help in reducing the cost of cultivation and increase the chances of higher yield due to uniformity in agricultural processes. Now the same idea of pooling marginal farm fields has come with a slight change in nature, which is pooling of farm land is solely by a farmer who does it by leasing as many neighbour fields as possible. It is noteworthy that all the recent success reports and huge earning reports in paddy cultivation are certainly from those who cultivate paddy at least in five hectares (Thuruthumaly, 2019). It is notable that the commercial crops like rubber in the state are now being cut into marginal lands by huge estates, whereas marginal paddy fields are now being added to constitute huge 'paddy estates' in the state.
- It has been found that there is an average increase in yield by 10 quintals per acre. It is estimated that the farmer can earn Rs. 55,000 as gross earning per acre (Thuruthumaly 2019). With an estimated average cost of Rs. 25,000 per acre, a farmer can earn Rs.

30,000 as the net average income. Assuming the field is taken on lease, which will cost Rs. 20,000 on an average per acre, the income will come down to Rs. 10,000. With the given two seasons of paddy cultivation, a marginal farmer (with one acre) can only earn up to Rs. 20,000 per year which is an abysmal amount for a family to survive. So, the paddy estate idea will be viable only if a large scale lease land is available (50 acres on an average) or with at least 10 to 15 acres of own land, farmers say.

- However attractive the economics of large scale 'paddy estates' might seem, there are problems that still persist in the field. For instance, it is evident that large farming with a minimum of 10 acres will survive, but the government paddy procurement rules exclude farmers who cultivate in more than five acres of land. The government support price/fair price can only be claimed by those who fall under below five acre category. All others are forced to sell their harvest to the private mills by accepting whatever price is offered by them. The government fair price and private mill prices vary considerably, say Rs. 25 per kg and Rs. 16 per kg respectively. Hence, the government policy is actually discouraging the

farmers and forcing them to avert ways of better income.

- It is injustice that the government treats those who take large amount of land on lease to cultivate paddy as equivalent to wealthy or rich. Because, all forms modernization of agriculture such as mechanization, uniform cropping pattern and large scale harvest and processing rely on large scale cultivation only. To tackle this issue, some farmers are now manipulating the documents so as to claim the government support price. Farmers say that, a minimum of 50 acres or so can only fetch a good compensation for their efforts, so at least the government price should be offered to those who fall under below 50 acres of cultivation category.
- Further, machines and improvements in other basic facilities have crucial role in making paddy cultivation profitable. The cost of such items should also be controlled and subsidized as increase in the price of these machines according to the hike in paddy price will ultimately make no change in the farmer earning, irrespective of the area they operate in. Ever increasing trend of the labour wage in the state is another problem to be tackled at the same time.

Figure 1: Paddy Farmers in Kuttanad with their Harvest.



Source: www.scroll.in/article/917638

Recommendations

- Awareness must be created about the regained fertility of paddy fields and the importance of maintaining it without the use of chemicals. Experts say that dumping the paddy harvest residues such as straws will help in maintaining the fertility. Burning such residues in the field is a common practice

which actually reduces the fertility of the ground. By conveying all such information to the farmers, government should use this opportunity to attract the farmers back to the field.

- Large scale farming on leasing should be encouraged by giving support price to the farmers who cultivate up to 50 acres. At the same time, the potential threat

of corporate sector swallowing the paddy fields by leasing thousands of acres should be stopped. Necessary checks should be maintained to curb this threat and it should be ensured that the benefit of paddy estates reaches farmers.

- Subsidies for machines and improvement in other basic facilities should be enlarged because mechanization and related amenities are pre-requisite for large farming such as 'paddy estates'.

- Research on developing new varieties which will resist flood water and saline water is at its infancy in the state. The process should be boosted up to benefit the fields.

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Horticultural Crops in Assam and Meghalaya: Constraints and Opportunities

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Introduction

- Assam is gifted with a unique agro-climatic condition which permits growing of a wide range of horticultural crops. The climate accommodates various fruits, vegetables, flowers, spices, medicinal and aromatic plants, nut crops, tuber crops and plantation crops. On the other hand, Meghalaya also has enormous potential for the development of horticulture. The variation of altitude, soil and climatic conditions and temperature regime of the state provide ample scope for the growing of different types of horticultural crops including fruits, vegetables, spices, plantation crops and medicinal and aromatic plants of high economic value.
- This study covers two states, Assam and Meghalaya. Following the multi-stage stratified random sampling technique, two districts dominating in the cultivation of horticultural crops, i.e. Kamrup and Nagaon districts in Assam and East Khasi Hills and Ri-Bhoi districts of Meghalaya were selected at the first stage. In the next stage, two orange growing blocks viz., Boko and Bangaon from Kamrup district and Myllem and Mawphlang from East Khasi Hills district were selected. In the third stage, 5 villages were selected and from each village eight beneficiary households were selected randomly. Similarly, two banana growing blocks viz., Bajia and Laokhowa in Nagaon district and two pineapple growing blocks viz., Umling and Umsning in Ri-Bhoi district of Meghalaya were selected. From each block, 5 villages were selected and from each village, eight beneficiary households were selected at random. Thus, a total number of 160 beneficiaries were selected for the study.

Findings

- The total production of orange was 5,968 quintals among sample households in the Kamrup district of Assam, valued at Rs. 28.82 lakhs and total marketable surplus was 5,731 quintals i.e., 96.04 percent of the total production. The total gross return from sale of the marketable surplus of orange was Rs. 27.65 lakhs and per household return was Rs. 96,136. The marketable surplus of banana produced by the sample farmers of Nagaon district of Assam was 96.01 percent of the total production. Total sale proceeds from banana for the farmers were Rs. 40.83 lakhs and the average per household income from the sale of banana was Rs. 1,02,077.
- The sample farmers of East Khasi Hills district in Meghalaya produced 2,816 quintals of orange and marketed surplus was 95.85 percent. The total sale proceeds from the marketed surplus were found at Rs. 12.65 lakhs and the average per household receipt from sale proceeds was Rs. 31,638. The total marketed surplus of pineapple of the sample farmers of Ri-Bhoi district in Meghalaya was 6,700 quintals which was 95.84 percent of the total production. The total receipt from the sale proceeds of pineapple was higher (Rs. 95,433) in medium farms. The average per household receipt from the sale proceeds of pineapple was Rs. 49,650.
- The identified major marketing channels of orange, pineapple and banana in Assam and Meghalaya were - 1. Producer - Retailer - Consumer 2. Producer - Commission Agent - Retailer - Consumer 3. Producer - Commission Agent - Wholesaler - Retailer - Consumer.
- Price-spread of orange in Channel - 1 was worked out for Shillong, Guwahati and Boko markets.

- The producer's share of consumer's rupee was 48.75 percent in Shillong market, 50.00 percent in Guwahati and 52.78 percent in Boko market. The retailer's net margin was found to be 46.87 percent in Shillong market, 45.75 percent in Guwahati market and 43.06 percent at Boko market.
- The analysis of price-spread for orange in Channel – 2 showed that grower's share of consumer's rupee was 41.87 percent in Shillong market, 39.00 percent in Guwahati market and 38.50 percent in Boko market. The commission agent's share of consumer's rupee was 22.12 percent in Shillong market, 21.80 percent in Guwahati market and 22.00 percent in Boko market. Excluding the transportation, sorting and market charges, the retailer's share of consumer's rupee was 32.25 percent in Shillong market, 34.45 percent in Guwahati market and 34.50 percent in Boko market.
 - The price-spread of orange in Channel – 3 showed that producer's share of consumer's rupee was 37.50 percent in Shillong market, 35.50 percent in Guwahati market and 34.72 percent in Boko market. The commission agent's share was 15.56 percent in Shillong market, 14.35 percent in Guwahati market and 15.22 percent at Boko market. The wholesaler's net margin was found at 12.50 percent in Shillong market, 12.65 percent in Guwahati market and 12.06 percent in Boko market. The retailer's margin was recorded at 29.43 percent in Shillong market, 31.75 percent in Guwahati market and 31.88 percent in Boko market. Handling, transportation, grading, storage charges and market charges/market fees also varied from market to market depending upon the local rates.
 - The price spread of pineapple in Channel – 1, for Nongpoh and Guwahati markets showed that the grower's net share of consumer's rupee was highest in Nongpoh market (50.00 percent) followed by Guwahati market (46.67 percent). The growers viewed that in this channel they were getting better prices than selling at farm site on contract. The retailers were making handsome margin, the highest being 40.40 percent in Guwahati and 40.00 percent in Nongpoh market.
 - The price spread of pineapple in Channel – 2 shows that the grower's share of consumer's rupee was 46.43 percent in Nongpoh market and 43.33 percent in Guwahati market. The commission agent's share of consumer's rupee was 25.00 percent in Nongpoh market and 26.93 percent in Guwahati market. Excluding the transportation, sorting and market charges, the retailer's share of consumer's rupee was 20.00 percent in Nongpoh and 16.80 percent in Guwahati market.
 - The price-spread analysis of pineapple in Channel – 3 shows that the producer's share of consumer's rupee was 42.86 percent in Nongpoh and 40.00 percent in Guwahati market. The commission agent's share was 24.86 percent in Nongpoh market and 26.00 percent in Guwahati market. The wholesaler's net margin was found at 10.14 percent in Nongpoh market and 10.13 percent in Guwahati market. In channel – 3, retailer's margin varied from 12.14 percent in Nongpoh market to 10.26 percent in Guwahati market.
 - The price spread of banana in Channel – 1 showed that the grower's net share of consumer's rupee was highest in Nagaon market (49.20 percent) followed by Sonitpur market (48.08 percent). The retailers were found to earn more margins, around 43.80 percent in Nagaon market and 43.83 percent in Sonitpur market.
 - The price-spread analysis of banana in Channel – 2 showed that the grower's share of consumer's rupee was 47.30 percent in Nagaon market and 44.17 percent in Sonitpur market. The commission agent's share of consumer's rupee was 25.20 percent in Nagaon market and 27.16 percent in Sonitpur market. Excluding the transportation, sorting and market charges, the retailer's share of consumer's rupee was 21.00 percent in Nagaon market and 20.58 percent in Sonitpur market.
 - The price-spread of banana in Channel – 3 for Nagaon and Sonitpur markets shows that the producer's share of consumer's rupee was 40.90 percent in Nagaon market and 38.33 percent in Sonitpur market. The commission agent's share was 22.40 percent in Nagaon market and 23.50 percent in Sonitpur market. The wholesaler's net margin was found at 10.00 percent in Nagaon market and 11.00 percent in Sonitpur market. In channel – 3, retailer's margin varied from 12.14 percent in Nagaon market to 10.26 percent in Guwahati market.
 - The marked improvement of horticultural sector in the study area was due to the implementation of Horticulture Mission for North East and Himalayan States (HMNEH) which contributed immensely towards increased fruit production. However, horticultural crops cultivators encountered a number of problems which included lack of adequate horticultural research and development and extension services, inadequate technology and unscientific method of cultivation, undulating topography and land ownership pattern in Meghalaya, inadequate

road, transport and communication facilities, derisory storage facilities, small scale production and perishability, insufficient fruit processing units, need of proper packaging, handling and refrigerated transport, dearth of grading and standardization, inadequate marketing and distribution network.

Conclusions and Recommendations

- Research and development activities on pineapple, banana and orange should be strengthened to increase production and productivity with improvement in quality to increase profit per unit of area.
- Extension services in the state should be strengthened with field demonstration on scientific cultivation of pineapple, banana and orange.
- A Multipurpose Grower's Marketing Co-operative Society with cold storage and transport facilities should be set up which would help in eliminating the monopolistic trade practices of market functionaries.
- There is an urgent need to create & maintain cold storage facilities at the nearby market places.
- Proper road communication system must be developed to facilitate the transportation of marketable surplus to the assembling and marketing centres.
- The fruit growers may be encouraged to adopt some post-harvest technologies including grading and

standardization of pineapple according to its size, shape and degree of ripeness.

- A comprehensive plan to build regulated market with all facilities should be developed in strategic location.
- There is an urgent necessity of establishing processing units for canning and processing of surplus fruits.
- The provision of institutional credit, particularly from co-operative and institutional sources should be strengthened.
- To achieve the untapped potential of export, systematic market survey should be conducted.
- The study has highlighted that the prospect of horticultural crops in Assam and Meghalaya is bright provided the marketing facilities and the needed infrastructural supports are ensured. The study has concluded that the establishment of fruit processing industry and improvement of marketing network would help in the commercialization of horticultural crop cultivation in Assam and Meghalaya.

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Redeliberating Potentials of Dairying and Examining the Improvement in Socio-Economic Status of Milk Producers in Jharkhand

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Introduction

- Dairy sector plays an important role in socio-economic development of rural households. In India, over 70 percent of the rural households own livestock and a majority of them are small, marginal, and landless farmers. Milk production in Jharkhand was estimated at 20.69 lakh MT (in 2017-18), whereas as per Indian Council of Medical Research, 28.82 lakh MT is required. Thus, a deficit of 8.13 lakh MT was recorded. Similarly, per capita milk availability in the State was found to be 171 grams per day, whereas national per capita milk availability is 302 grams per day, which indicates per capita per day lower milk availability of 131 grams than the national average.
- The state contributes 1.14 percent to the total milk

production in the country. However, contribution of agriculture and livestock together was recorded 12.75 percent of the Gross State Domestic Product (GSDP) during 2016-17. Livestock sector's share alone to the GSDP was recorded as 2.32 percent (Economic Survey of Jharkhand, 2017-18).

- Animals in the state of Jharkhand usually have low milk productivity as compared to other states due to inadequate nutrition, poor management of animals, tropical heat and diseases. Despite these adverse conditions, milk production in the state has increased to 12.79 percent during the period of 2012-17.
- In Jharkhand, rural milk trading practices were neither appropriately developed nor was the milk marketing network widely established. Hence, milk

was produced mostly for household consumption and local marketing. However, there is a tremendous scope for dairy co-operative and development of milk routes through institutional arrangements with milk processing plants. In order to meet the requirement of milk and its products, around 6 to 8 lakh litres of milk was being procured daily from neighbouring states till the last two years through organized sector. At the same time, the state which had been struggling for self-sufficiency in milk production has now started implementing feed and fodder development programmes. As a result, the milk production in rural areas is increasing significantly.

- In order to find and assess potentials of dairying and socio-economic status of milk producers in Jharkhand, a study was conducted in the year 2017, based on both primary and secondary data collected from four dairy districts, namely; (i) Medha Dairy, Hotwar, Ranchi, (ii) Lohardagga Dairy, Lohardagga,

(iii) Hazaribagh Dairy, Hazaribagh and (iv) Deoghar Dairy, Deoghar. 60 milk producers of which 30 were Dairy Cooperative Society (DCS) members & 30 Non-members were selected from each of the sample districts. Thus, a total sample size of 240 was selected for detailed study in Jharkhand.

Findings

- Most of the dairy farmers were found to be unaware about recommended quantities of cattle feed.
- Lack of technical guidance (66.67 percent) and lack of purchasing power (33.33 percent) was experienced sometimes, lack of co-operation and co-ordination among members (63.33 percent) was found, and poor rate of conceiving through Artificial Insemination (64.17 percent) were some of the technical, socio-psychological and other constraints faced by the surveyed dairy farmers.

Table 1: Production and Per Capita Milk Availability in Jharkhand (2013-14 to 2017-18).

Year	Milk Production (In Lakh MTs)	Per Capita availability (gms/day)
2013-14	14.60	146
2014-15	17.34	147
2015-16	18.12	152
2016-17	19.70	157
2017-18	20.69	165
CAGR (%)	9.11	3.11

Source: Department of Animal Husbandry & Fisheries, Government of Jharkhand, 2017-18.

- The total number of Gokul Gram Vikas Kendras was recorded as 268 in the state. Among the districts, Ranchi had the highest (52) followed by Deoghar (26).
- The total number of bulk milk coolers in the state was 20, out of which, Ranchi had the highest, 11.

Table 2: Livestock Population, Milk Production and Per Capita Availability in Sample Districts.

District	Livestock Population (In Lakh)			Breedable cattle & Buffalo (In Lakh)	Annual milk Production (In Lakh MT)	Per Capita availability/day (In grams)
	Cow	Buffalo	Total			
Deoghar	5.07	0.43	5.50	1.84	1.10	202
Hazaribagh	4.46	1.06	5.53	1.59	1.01	160
Ranchi	4.46	1.00	5.46	1.43	1.79	169
Lohardagga	1.41	0.15	1.56	0.38	0.26	152

Source: As per Census, 2012-13, Government of Jharkhand.

- Jharkhand Milk Federation has been functioning with 1,790 DCSs and had 8,750 members in 2015-16. Its procurement capacity was estimated to be 61,000 litres per day, while its liquid milk marketing capacity was 304 thousand litres per day.
- The area under permanent pastures and other grazing land was found to be 110 thousand hectares. It had a surplus of 15.45 MTs of dry fodder, but deficit of green fodder was estimated at 18.86 MTs.

- The state has 12 District Co-operative Milk Unions and 14 milk processing and chilling centres with a capacity of 45,000 litres per day.
- Agriculture and livestock in the state were not rewarded by return because of unproductive land, climatic factors, and breed of livestock yielding 0.5 to 1.5 litre of milk per day.
- After creation of the state, dairy development programmes were being implemented intensively in order to create rural self-employment through dairy farming.
- As a result, translation of these endeavours had led to increase in milk production from 7.74 lakh MTs in 2001-02 to 20.69 lakh MTs in 2017-18. The state is basically rural economy, as 70.80 percent of the population is engaged in agriculture and allied activities. The incidence of poverty is very high, particularly among scheduled tribes and scheduled castes. They constitute about 38.10 percent of the state's total population, hence, their economic development should be the prime concern for the state.
- Extension services on dairying should be provided at doorsteps, as majority of the milk producers in the state do not have easy access to these facilities.
- The average return on production of milk was found lower than the cost incurred thereon, so training should be given to milk producers apprising them with the devices to reduce input costs.
- Most of the animal rearers belonging to SC/ST classes were found to be economically backward. So, special facilities should be provided for them to remain in the venture.
- For sanctioning dairy loan, 'Dairy Loan Melas' should be arranged at village/panchayat levels.
- Awareness about animal insurance was found to be very poor in the study area. So, there is a need to create awareness not only among farmers, but rural people too for its wider coverage.
- Care should be taken by the concerned veterinary personnel/animal husbandry officer during the course of artificial insemination.
- Farmers should be apprised of recommended doses of cattle feed at regular intervals.

Recommendations

- More emphasis should be given to make dairying more viable, particularly for the people of SC/ST community, so that they feel encouraged in adopting this enterprise.
- Large and medium sized milk producers should be pertinently persuaded to adopt dairying as small scale enterprise in the state.

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