



Production and consumption pattern of livestock products in Meghalaya and its implications in development of market strategies for the state producers

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Meghalaya is a state where more than 85% of the population consumes meat and more than 5 lakhs households are engaged in livestock rearing (19th Livestock Census, GoI, 2012). This makes livestock sector an integral livelihood support and source of food for the people of the state. During the last few years, the average numbers of animals slaughtered annually was estimated at about 1.89 lakhs cattle, 1.81 lakhs pigs, and 1.26 lakhs goat, out of which about 40% of cattle, 11.25% pig and 18.36% goats are imported from outside the state (Animal Husbandry and Veterinary Department, Government of Meghalaya, 2015). Majority of the livestock farmers in Meghalaya are composed of landless labourers, small and marginal farmers, most of who lives below poverty level. Livestock sector is the most probable solution to address the challenges of accelerating farm income and sustaining the agricultural development in the state. Among the livestock enterprises, it is observed that poultry sector is better organised in the state. Farm holdings with 500–1000 birds for egg production and 100–500 birds for broiler production are now common in the state (Animal Husbandry and Veterinary Department, Government of Meghalaya, 2015). Pork has the highest market demand in the state owing to its taste and nutrition, most suited to the population and also provides employment option to supplement the income and improve the living standards of the rural farmers. Lalrinsangpuui *et al.* (2016) studied the production and consumption pattern of milk and meat in the north eastern region of India but the study was restricted to only cattle and the consumption pattern was studied based on per capita availability of the products. Gandhi and Zhou (2010) studied the consumption of livestock product including different kinds of meat but it was based on national level data and lacked region specific or state specific issue. The present study focused on a single state (Meghalaya) and covers all the livestock categories

and the consumption pattern was analysed based on National Sample Survey report. To explore the prospects and constraints in livestock sector, with an inclination towards marketing opportunities, the present study examined and analysed the growth in livestock population in Meghalaya and consumption pattern of livestock products.

Secondary data from various issues of Livestock Census, Report on Integrated Sample Survey, Directorate of Animal Husbandry and Veterinary, Government of Meghalaya were utilized to collect time series data on animal population, production, etc. Per capita income was obtained from Basic Statistics of North Eastern Region, 2015, published by NEC, GoI and monthly value of consumption of various livestock products was obtained from NSSO report, 61st and 68th rounds. Basic market information was collected from local village market in Umiam, Ri-Bhoi district and Iewduh market, East Khasi Hills District. Compound Annual Growth rate was computed using ordinary least square method to fit the exponential function (Dandekar 1980). Income elasticity of different livestock products was calculated to examine the change in demand for these products according to change in income. Percentages, ratios and other tabular analysis methods were also utilized to meet the objectives.

According to 19th Livestock Census 2012, Meghalaya has a total livestock population of almost 80 lakhs, constituting cattle, buffalo, sheep, goat, horses and ponies, pig and poultry. West Garo Hills district contributed 22% of the total livestock population, which is the highest among the districts. Bulk of the animals reared in the West Garo Hills district are indigenous while only a mere 0.4% are crossbred varieties. The percentage of crossbred animals are more in case of East and West Khasi Hills district. With the data of livestock population from 1966 census till 2012 census, compound annual growth rates (CAGR) were calculated for each nine inter-census period (Table 1). Among the animal species, positive CAGRs during all the periods were observed in cattle, pig and poultry. Negative growth rates were observed during few periods in case of buffalo, sheep, goat and horses and ponies. However, since the 1997 census, there have been positive growth rates in all the species, except in horses and ponies. The CAGRs

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Table 1. Growth pattern of livestock population in Meghalaya

Period	Cattle	Buffalo	Sheep	Goat	Horses and Ponies	Pig	Poultry
<i>Compound annual growth rates (%)</i>							
1966–72	2.02	3.24	–2.54	–0.68	–9.33	2.74	NA
1972–77	0.42	–3.25	3.13	4.39	3.71	3.52	2.11
1977–82	2.85	–5.75	4.36	9.34	5.92	6.41	5.65
1982–87	1.28	–0.7	–10.42	0.85	–8.97	6.33	2.31
1987–92	1.68	3.96	8.92	0.21	–16.74	0.98	2.79
1992–97	3.46	–12.94	–5.87	7.39	0	3.55	3.34
1997–02	0.32	1.15	1.15	3.15	0	3.71	5.56
2002–07	2.95	5.02	3.13	2.22	8.45	4.52	1.85
2007–12	0.42	1.68	0	5.28	–19.73	1.66	2.9

for different periods in case of sheep was very erratic while those of pig and poultry were more or less stable.

Examining the per cent growth of livestock population in the districts of Meghalaya over the decade 2002–2012, the highest growth rates in cattle, goat, pig and poultry were observed in South Garo Hills district (Table 2). Buffalo population increased the most in East Khasi Hills, which substituted cattle for milk production as the yield was better and it required less maintenance. Sheep population growth was highest in West Garo Hills followed by East Khasi Hills and was negative in the rest of the districts, as sheep is reared mainly for meat purpose and the meat is not as popular as beef or pork. As Meghalaya has large tracts of continuous land tracts which is congenial for sheep rearing, efforts may be made to popularize sheep rearing with a slight change in the approach, which is rearing for wool rather than meat.

The per capita income in Meghalaya increased by 11% from 2004 to 2014. Moreover, the compound annual growth rate in per capita income increased from 4.5% during 1994–2004 to 9.5% during 2004–14. With the population preferring meat to other livestock products, it will be valuable to study the effect of change in income on the

Table 2. District wise decadal growth rate (%) in livestock population (2002–12)

District	Cattle	Buffalo	Sheep	Goat	Horses and Ponies	Pig	Poultry
East Khasi Hills	51.04	676.99	28.01	47.68	–89.35	25.56	22.14
Ri – Bhoi	–35.78	39.93	–93.98	79.26	–92.71	–21.25	29.82
West Khasi Hills	15.71	109.81	–32.85	44.19	15.14	26.95	34.19
Jaintia Hills	–26.55	27.88	–98.91	50.50	–92.53	14.36	–34.41
East Garo Hills	–8.30	–97.34	–41.46	–6.81	–28.57	46.80	58.44
West Garo Hills	60.70	14.28	62.22	40.18	–11.11	70.81	23.70
South Garo Hills	73.72	–95.12	–95.31	118.38	–100.00	112.64	62.37

Table 3. Income elasticities of different categories of livestock products

Livestock product	Rural	Urban
Milk	1.26	0.32
Egg	1.08	1.60
Fish	0.82	0.82
Mutton	1.73	–0.06
Chicken	1.34	1.11

demand for different livestock products. The National Sample Survey (NSS) data on household consumption behaviour for the year 2004–05 and 2011–12 published by NSSO and the per capita NSDP (Net State Domestic Product) at current prices were used to calculate the income elasticities of demand for livestock products. The income elasticity of demand is useful in forecasting demand, formulation of price policies and planning the diversification of livestock product through processing. It was observed that milk is a luxury good in rural region but a necessity in urban region, which implies that if consumers' income increases, demand for milk will increase in rural region and will not be much affected in urban region (Table 3). Egg was a luxury good in both rural and urban region which means that demand for egg will rise in the future as income has an increasing trend. Fish was a necessary good in both rural and urban region and as such its demand will not fluctuate much in the future as income rises.

In case of mutton, it was a luxury good in rural region and an inferior good in urban region. This result imply the taste structure of the rural and urban population indicating that rural consumers are more fond of mutton than the urban counterparts. In Meghalaya, beef and pork are popular meat without which their meal is incomplete. On the other hand, the habit of consuming chicken is a comparatively recent development. But health consciousness regarding red meat (beef and pork), due to its high cholesterol content, have shifted the consumption towards more of chicken. This may explain why chicken is a luxury good in Meghalaya and why the consumers will spend more on consumption of chicken when their income rises. Also, Mahajan *et al.* (2015) reported that all the states in the north eastern region are deficit in mutton production and all states except for Manipur and Sikkim are deficit in chicken production. To cater to the increasing demand for chicken, the local poultry breed may be given a thrust, considering the taste preference of the population for the local poultry meat to broiler. For small farmers, improved breeds such as Vanaraja and Gramapriya may be adopted as they are suitable for backyard rearing with better quality meat and bigger size egg and taste similar to that of local breeds.

Dairy farming is an emerging enterprise for the farmers in Meghalaya. Currently, milk yield from crossbreed and indigenous cows and buffaloes are 3245, 274 and 616 kg per year respectively. This can be increased further safely

through increasing the availability of feeds, culling of low producers, strengthening of field programmes of selection and progeny testing of bulls for milk and providing breeding and other input services at the farmers' door. As the population are not in the habit of drinking milk, the marketed surplus tend to be high which shows a high potential for export to the neighbouring states. The season-wise pattern of utilization of milk in Meghalaya revealed that 96.24% was sold as fluid milk, 1.55% was processed into different milk products and only 2.15% was consumed by the households. The trend in the utilization of milk over the period 2004–2014 was worked out which revealed a significant increasing trend (0.47) in the percentage of milk sold as fluid milk while significant decreasing trends were observed for percentages of milk converted into milk products (–0.20) and consumed as milk by households (–0.28). The poor road connectivity, lack of knowledge about the proper market linkages, poorly maintained infrastructure in local market (such as chilling tank) are few of the problems which cause difficulty for the producers in bringing their product to the market. Formation of dairy cooperatives is a viable option for collective marketing of the small producers' milk. Thrust can be made in the processing of milk into different milk products, which at present is not only in the nascent stage but also the percent of the milk produced being processed has been recording a declining trend.

The per capita availability of eggs per year in Meghalaya is only 35 against 180 as recommended by ICMR. The requirements of eggs in Meghalaya are met by importing from other states as the total egg production in the state is not able to cater to the requirement. The high transportation cost has increased the price of eggs in the Iewduh market (popularly known as Bara bazaar). The local desi eggs are priced at ₹ 10/egg or maybe more at times. Considering the preference of the consumers for the desi eggs, the supply is generally not sufficient to meet the demand. This calls for a joint endeavour of the public and private sector to provide requisite services related to egg production and marketing in the rural region. This may include providing improved stocks and technologies focused on minimizing the feed expenditure and a proper market for their products. The trend in the utilization of egg over the period 2004–2014 was worked out which revealed increasing trends in the percentage of egg consumed (0.94) and set for hatching (0.09) while decreasing trends were observed for percentages of damaged (–0.06) and sold (–0.98). However the trends not being significant, conclusive policy directions cannot be inferred.

The heavy demand for meat in the state is met by imports from neighbouring state, Asom. During 2014–15, 36% of beef, 13% of pork, 4% of mutton and 4% of chicken were imported for domestic consumption. This situation is sad, because Meghalaya is a state most suited to livestock rearing and is a potential exporter of meat. However, Lalrinsangpuui (2016) stated that among the eight states in the north eastern region, the increase in meat production is significantly

higher in Nagaland and Meghalaya which may be due to their large livestock base and people's preference for meat. A perusal of the different meat categories imported to Meghalaya during the decade 2004–2014, showed that the per cent import of pork had a significant positive trend value. The analysis also showed non-significant increasing trend in percent chicken import and decreasing trend in beef and mutton import. This finding clearly signals the increasing preference of pork consumption, as inspite of an increasing trend in pork production, the state is increasingly importing the meat from other states in the last decade.

The objective of an efficient market being to maximise the producer's share in consumers' rupee, it becomes imperative to facilitate the ease of direct marketing for the pig farmers. Presently, pork and other meat, including fishes in Umiam, Ri-Bhoi District of Meghalaya, are obtained from Iewduh market (Bara Bazaar, Shillong). More than 60% of the pork sold in Iewduh market is brought as live animals from Guwahati and cleaned in Mawlai at the cost of about ₹ 400/animal. Small traders in Umiam obtain the dressed pork from Iewduh which are brought down to Umiam and sold to the consumers. Pork available in Umiam is not fresh and is priced higher than in Iewduh (higher by about ₹ 30/kg). In order to provide fresh and fairly priced pork in Umiam, intensifying pig production by the local farmers is a necessity, which can be manifested through improvements in breeding, feeding system and health and hygiene management. An enhanced production should be complemented by the presence of a proper market outlet where the farmers have a fair bargaining power. This should be a congenial and encouraging environment for the farmers to take up pig farming as a lucrative enterprise.

In spite of having the growth potential, there are several factors of cost disadvantage that accrue to livestock producer in the state such as infrastructure bottleneck, power, lack of knowledge on scientific rearing and health management, unregulated and inefficient market, etc. With a rise in the number of unemployed youth in the state under various poverty situations, a little institutional support will give a long hand in making livestock enterprise a sustainable livelihood option for them.

SUMMARY

To find out the trend in production and consumption of livestock products in Meghalaya and explore the means and ways to plan an efficient and proper market accordingly, the study was conducted using both secondary and primary sources of data. The clear cut objectives were to examine and analyse the growth in livestock population in Meghalaya and to analyse the consumption pattern of livestock products. Compound annual growth rates (CAGRs) in livestock population during nine inter-census periods were positive for cattle, pig and poultry; negative growth rates were observed during few periods in case of buffalo, sheep, goat and horses and ponies; sheep population mostly showed negative growth rate as sheep is reared mainly for meat purpose and the meat is not as popular as beef or pork.

Milk, egg, mutton and chicken are still luxury items in the rural region; egg and chicken are items of luxury in urban regions whereas fish consumption was relatively income inelastic in both rural and urban regions. Thrust can be made in the processing of milk into different milk products and popularization of sheep rearing focusing on rearing for wool rather than meat.

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