



POULTRY SUBSECTOR IN MEGHALAYA: A REVIEW



Institute of Livelihood
Research and Training



SFAC
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Executive Summary

Poultry serves multiple purposes which has social, economic, cultural and religious value for inhabitants of Meghalaya. With a population of close to 3 million, the 2007 livestock census puts the total poultry population at over 3 million indicating that there is almost one bird for each human. Poultry is reared for two distinct products – eggs and meat. In the last five years broiler poultry farming through closed housing system had perpetuated as a profitable small scale business venture in the state. Largely supported by private players through establishing hatcheries to supply Day Old Chicks (DOCs), palette feed vaccines and basic operation knowledge of broiler farming. Business had been taking roots but with much slower rate and without a cluster based approach. Present private players had advocated deep litter production system with vendor based input supply channel to primarily expand its business and in turn enhancing productivity. However synergy between government program that traditional backyard poultry farming had inherent strength in comparison to broiler farming and need focused approach to benefit large number of poultry farmers in the state.

At present, the production system and service linkages status of both of these systems of poultry farming, are entirely different and have grown as two different, rather separate systems of production in the state. However, organized layer bird farming has not been observed in the field in spite of high egg demand and supply deficit.

Backyard Traditional (*desi*) Poultry Farming

The 2007 livestock census indicates that 90% of the poultry population comprise of *desi* variety characterized by low input scavenging system of production, wherein only occasional supplementary feed of home grown grains and night shelter is provided by producer. An average of 10 to 15 birds are reared in the backyard system and kitchen waste, insects, open field grazing, grains in field comprises the feed ingredient.

This system of production in the state is marked by high mortality due to spread of infectious diseases and worm infestation, slow growth of chicks and poultry. The cycle of production has a 6 to 9 months range. The market demand for backyard *desi* poultry is very high and an adult bird fetches high price of Rs. 450 to Rs.500 per bird. Local haats form the major selling avenue for such birds and as per the sample household survey sale from home is almost 65%. Poultry also provides eggs (50 to 80 in a year), which gets sold locally and some of eggs are used for hatching to get chicks and multiply the initial stock. Production system is largely self-managed and no dependency on any external agency for input is solicited. The most serious problem encountered by the farmer in this production system is spread of contagious diseases and non-availability of vaccines

The key concerns of the backyard system of rearing that need to be addressed are:

- Slow body weight gain
- Comparatively higher mortality rates
- Household level scaling up not possible
- Prone to predator attacks
- Selection of improved and high performing birds not promoted

-
- High production cycle (Maturity age)

These concerns can be addressed by the following interventions:

- Right selection can improve production
- Vaccination and regular deworming can reduce mortality
- Feed supplementation can enhance gain in body weight
- Layers variety can be promoted for eggs
- Local value chain strengthening
- Possible to brand as organic poultry meat

Broiler farming

It can be estimated that 7 to 8% of poultry in the state are reared under deep litter broiler farming system. Under this production system, birds are kept in higher densities of 300 to 1000 under a closed housing and fed 100% in captivity. Broiler poultry houses have some specifications but local modifications were made to suit the basic requirement. Vaccinated Day Old Chicks (DOCs) are supplied by hatcheries, palette feed is supplied by feed company and producers need to follow basic management guidelines to get 1 to 1.5 kg poultry within 45 days. It has seen a growth in last 5 years due to intervention of some private players as demand for poultry had remained quite high.

Broiler farming has the following strengths:

- Standardized operational processes
- Has high scalability potentials
- Higher feed efficiency (Feed Conversion Ratio)
- Proven successful to meet demand and control price of poultry

The key concerns of the Broiler farming sector that need to be addressed are:

- High dependence on outside (external to locality) input supply
- Requires high investment in housing and feeding
- Use of chemicals and antibiotics gets manifold increase with time
- Local diversity of poultry gets reduced
- Only meat focus , eggs are not produced

Kuroiler Farming

A coloured bird having higher genetic growth potential had been introduced in the state. It is characterised as hybrid between *desi* and broiler farming. However field experiences suggest that due to non-improvement of management of backyard farming, it has not picked up in the state. The availability of kuroiler chicks had also been reported as a constraint.

Recommendations

The study recommends that traditional poultry farming needs immediate support of vaccination, deworming and basic management improvement on the technical side of things. Poultry farmers aspire to keep high productive coloured breed suitable for their backyard farming system with reduced mortality. Broiler and kuroiler farming can go hand in hand but backyard *desi* poultry farming will remain in domination since it has been a traditional practice with smallholders.

Based on (a) field observation, (b) household surveys, (c) informal discussions with individuals, and (d) focused group discussions, the study makes the following recommendations to improve, strengthen and promote poultry based livelihoods in the state:

- Produce and / or procure (poultry disease) vaccination and develop cadre of vaccinators to provide door step vaccination services to poultry farmers
- Establish decentralized mini hatcheries and village level (poultry egg) incubators to accommodate poultry farmer's choice of bird and sustain diversity
- Promote vendors for quality chick supply
- Develop and standardize package of practice for backyard poultry through amalgamation of traditional practice with modern poultry management
- Train cadre of Livestock Nursing and management professional through short and long term courses
- Involve private players and work on PPP model to strengthen broiler poultry farming
- Promote village based learning groups (similar to Farmer Field Schools) to promote inter learning of poultry farmers
- Organize poultry farmers of the state into village and cluster level associations to strengthen business linkage

Objectives and Methodology

Institute for Livelihood Research and Training (ILRT) is partnering with the Meghalaya Basin Development Authority (MBDA) in providing capacity building support to the project staff in 8 identified blocks out of 39 blocks of the state in enterprise promotion. As part of the project, ILRT undertook livelihood mapping in the seven blocks and identified potential sub-sectors. A further in depth study of these subsectors will be undertaken to understand the livelihood gaps, identify potential for opportunities to improve the sub-sectors and provide recommendation to the state Govt. The core idea of undertaking these sub-sector studies is to assess the opportunities to bring local communities in to the fold of sub-sector, so that the sub-sector gets strengthened at one hand and the livelihood choices are enhanced.

The specific objectives of the study are to:

- understand existing players and their practices/ contribution for improvement of the sub-sector activities
- assess the gaps which are preventing to perform effectively with specific reference to the primary producer
- recommend implementable solutions to enhance the stake of primary producers in the sub-sector

Scope of the Study

To study poultry sub-sector in the state of Meghalaya covering the following parameters.

- Document existing practices of the sub-sector covering the pre-production, production and post-production stages
- Assess the current status of the sector which will include the number of people engaged in the activity, estimated annual income from the activity, contribution of the activity to the overall income portfolio of the household, current market structure and key players
- Understand the existing market situation and nature of relationship between different market players in the study area (relationships, attitudes and behaviors).
- Understand the capacity of producers and their organizations (POs) to access services, credit, information and resources.
- Suggest improvements in the value chain system to ensure direct linkages of the farmers with the major markets and increased incomes from their produce
- Relevance and capacity analysis of support structure

Methodology

The following methodology was employed (but not limited to) during the assessment.

- Literature Review

Review the existing markets in the state and market regulatory and price control policies and/or laws and mechanisms, any documents on market trends in the target area and any other relevant literature where possible.

- Developing the sub-sector map and map different players in each stage beginning from input supplier to consumer.
- Analysis of subsector dynamics

The analysis focuses on eliciting the information (i) existing practices by different players at each level, (ii) Gaps (iii) opportunities for interventions. Map potential local and regional markets in terms of type, size and volume of market, goods sold and bought, supply chain, type of producers, suppliers and vendors, women led businesses/trades, distance of the market from the target project villages, mode of transportation, market associations/trade organizations, security arrangement/situation especially for women and competitiveness (number of producers/suppliers /vendors versus items in demand).

Study Tools

- Producer interview/ interaction
- Focus Group Discussions (FGDs) with producer groups/ producers
- Semi-structured interviews with Key informants and stakeholders
- Sample size for the study
 - At least ten producers on random basis in villages selected on cluster sampling basis
 - At least ten producers, suppliers, and vendors per market for each activity
 - At least five consumers in each market (three women and two men)

Table 1: Sampling locations

Sl. no.	Village	Block
1	Kyllang	Mawthadraishan
2	Tiehnongbah	
3	Mawklot	Myllem
4	Lyngkien	
5	Lyngngai	Pynursla
6	Lumpengshyrngan	
7	Sahsniang A	Laskein
8	Nartiang	Thadlaskein
9	Mairang mission	Mairang
10	Balachanda	
11	Agipeng	
12	Borkonda	Betasing
13	Jarrangre	
14	Gasuapara	Gasuapara
15	Ramchenggre	
16	Aguragre	Rongram
17	Resupelpara	Resupelpara
18	Balmanpara	

State Profile

Geographical profile

Towards Northeast of India, Meghalaya is a Himalayan state, which lies close to Assam and shares a boundary with Bangladesh. State is sandwiched between Assam and Bangladesh.



Poultry production scenario in Meghalaya

Currently, two varieties of birds are being reared on a large scale - 1) *Desi* and 2) Improved (Kuroiler/Broiler). As per the Livestock Census 2007, the current population of the improved variety stands at 273498, a growth rate of 100 per cent from 2003 Census. The population of the *desi* variety stood at 275299, a growth rate of 4.87 per cent from 2003.

The Number of fowls including ducks has risen 48.78% from 5.72 Lakh in 1990-91 to 8.51 Lakh in 2006-7. Total egg production has risen almost in same proportion by 47%. This indicates productivity of poultry has remained almost same with 112-116 eggs per annum per layer over the period (See Annexure 1 for district wise population of Poultry in 2007).

Demand and supply status

As per Sample survey and Focused Group discussions conducted, it was found that over 60% eggs are sold directly in the market and hardly 15% eggs are set for hatching, indicating high demand for *desi* eggs in the market. *Desi* eggs are sold in the range of Rs. 6.00 to Rs.7.50 per egg in the state. .

Similarly 75% of the sample surveyed sold their poultry to local villagers. A fully grown size bird fetches Rs. 500 to Rs. 600 in the state whereas medium sized bird fetches Rs. 350 to Rs.400 in *desi* bird.

Only 20% of the sample had sold their poultry through traders and these were mostly broiler rearing families. 5% had adopted mixed option with partial sale to trader and partial to local villagers or in local weekly hats.

Meghalaya is highly deficient in eggs production and almost 35% egg is imported in the state annually. Similarly per capita availability of poultry meat is just 4.05 gram per day, which is much below recommended meat consumption.¹ Meat production in Meghalaya has grown from 16000 tons in 1972 to 34000 tons at end of 9th five year plan. State continues to import around 8000 tons of meat annual from outside of state².

Products

Poultry provides two important products – Eggs and meat. Meghalaya people have high preferences for freshly cooked poultry meat. Cooked chicken has significant cultural variations, however processing of poultry meat is almost negligible. Similarly eggs are consumed as boiled, omelets or in curry form as simple product and processed egg product is negligible.

Market

Poultry owners produce birds for consumption, gifts, sacrifice, as well as for sale. The sale of poultry brings crucial cash earnings to the poorer household. Poultry has high local demand. Local haats perform market conduit between seller and buyer. Poultry is easy to carry in bamboo baskets, local haats sales almost 70% of poultry produced in the state. Trade also happens through small collectors, who collect hens from local area and then provide it to community on non haat days and to institutional buyers like hotels and restaurants.

Employment

Poultry had been a key employment generator in the state in form of backyard farming for women and rural youths. With growth of Broiler and Kuroiler farming in the state, value chain actors like feed suppliers, medicine supplier & vaccinators, traders and transporters are increasingly getting employment by growth of poultry sector.

Fact is that most of employment and work force for backyard poultry comes from a vulnerable section, which can hardly find any other employment in other activity or wage, highlights role of backyard poultry as gainful employment generator for large section of rural population in the state. In return they get highly nutritious eggs and meat for household consumption and local sale.

Poultry income had been largely women earned income in the state and effectively uses free time available with rural women after household cores. Poultry farming fits well into fabric of present household responsibility of women and aged people.

With growth of Broiler and Kuroiler farming in the state, value chain actors like feed suppliers, medicine supplier & vaccinators, traders and transporters are increasingly getting employment by growth of poultry sector.

However real employment significance of poultry lies in women led activity in backyard farming. Poultry combines well with other household work of women at household level and provides both employment and nutrition to family.

¹ Planning report of Meghalaya chapter IX

² Livestock census of Meghalaya

Poultry Sub Sector

Poultry sub sector Status in India

India's poultry industry represents a major success story. While agricultural production has been rising at the rate around 2 percent per annum over the past two to three decades, poultry production has been rising at the rate of around 8 percent per annum, with an annual turnover of US\$ 7 500 m. What was largely a backyard venture before the 1960s has been transformed into a vibrant agribusiness with an annual turnover of Rs 30 000 crores. Today, India is the third largest egg producer in the world (after China and the United States of America), and the nineteenth largest broiler producer.

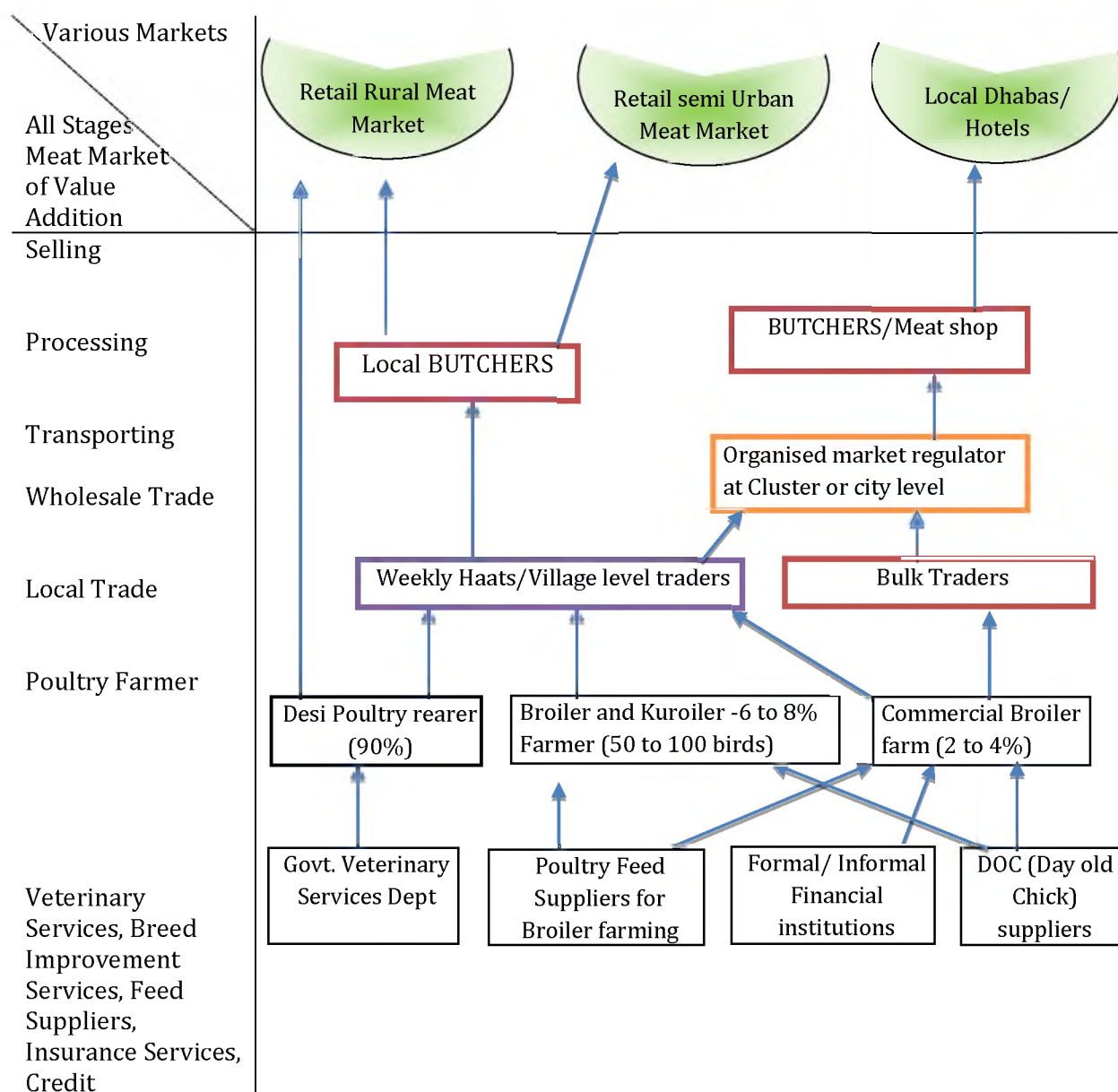
The relative share of poultry in the national economy has remained below 1 percent, but its share in the livestock sector is continuously rising from 10 percent in 1996- 1997 to 12 percent in 2003-2004. With demand increasing and the production level reaching 37 billion eggs and around 1 billion broilers in 1999-2000, the sector is estimated to employ around 1.6 million people. Whereas 80 percent of the employment is generated directly by the farms, 20 percent is generated in the provision of feed, pharmaceuticals, equipment and other services required by the poultry sector. Additionally, there may be a similar number of people who are engaged in marketing and other channels servicing the sector. By 2005, the total egg production in the country had passed 46 billion, and with higher broiler production, the estimated employment was 2.5 million

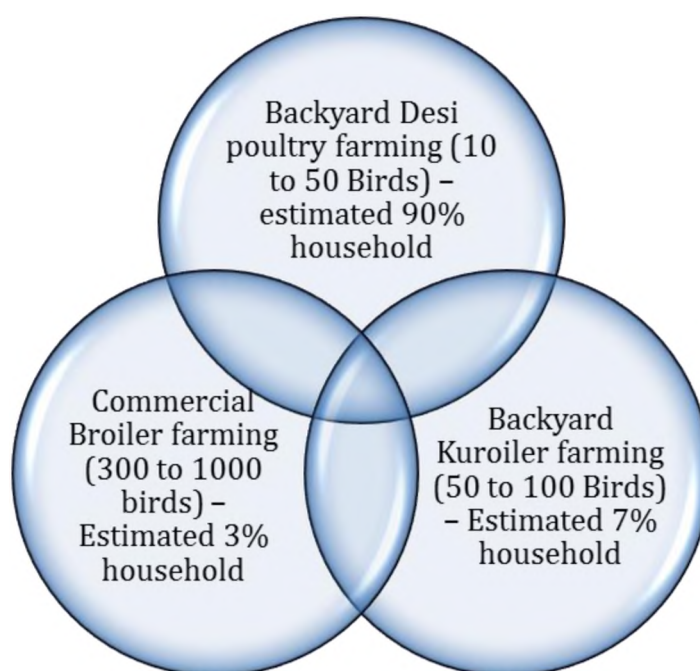
Assuming that the productivity of hens is the same throughout the country, the level of development of poultry production in a given region has to be judged on the basis of number of fowls per unit of population. The national average of the number of fowls per 100 persons is 47. The highest density is observed in the Southern region (62 fowls per 100 persons) followed by Eastern region (44 birds per 100 persons). The North and Central regions have the lowest densities (16 and 17 fowls per person, respectively). The annual growth rate of total poultry population during the period from 1997 to 2003 was 5 percent per annum.

Poultry sub sector Status in Meghalaya

Poultry sub sector largely operates in two forms – Backyard local bird farming (90%) and improved broiler and kuroiler farming (10%). Local (*desi*) birds are raised for both eggs and meat; however kuroiler and Broilers are largely raised to meet the demand of poultry meat. Fortunately there has been a significant growth in backward linkages of improved poultry farming in the state – in terms of improved vaccinated chick supply, balanced feed and medicines while forward linkages has been largely confined to local market.

Sub Sector Map of Poultry





Box 1: Classification of poultry production on the basis of bio security level

- **Sector 1** : Industrial integrated system with a high level of bio-security and birds or products that are marketed commercially
- **Sector 2**: Commercial poultry production with a moderate to high level of biosecurity and birds or products that are sold through slaughter houses or live bird markets
- **Sector 3**: Small holder commercial poultry production including waterfowl, generally with low levels of biosecurity and birds or products that are usually sold through live-bird markets
- **Sector 4**: Village or backyard production with minimal biosecurity and birds or products that are consumed locally.

Source: FAO/QIE (2007)

Poultry farming in Meghalaya has three prominent systems –

Backyard poultry farming forms a part of livelihood culture in the state and almost each household rears 10 to 15 *desi* hens in backyard for self-consumption and emergency cash needs. However in recent years a significant upsurge in scaling up of backyard and improved poultry farming had been observed in the state. On the basis of the above classification majority of the poultry systems in the state can be classed as Sector 4.

Backyard traditional poultry farming involves some investment in making night sheds for hen, and occasional feeding of grains; however large amount of feeding is gathered through scavenging mode by birds themselves. Recent up scaling has led to some improvement in

housing further and provision of home grown grains as supplementary feed to poultry birds at least once in a day.

Commercial poultry farming has been a recent growth in the state, but has found high adoption after demonstration of by successful poultry farmers. A backyard commercial poultry farming of around 300 birds has been a successful model in terms of significant profit and gainful employment to a significant number of rural youth/family in the state. At household level comparative economics of *desi* 50 birds and 300 broilers has shown following returns (based on cash flow of sample rarer). Annexure 2 describes the comparative household economics of backyard *desi* bird farming and small scale broiler farming.

As discussed in above table, income per month through broiler farming in the state is significantly higher than *desi* bird farming. *Desi* bird farming had been on subsistence level and provides a supplementary income and nutrition source. However rearing more *desi* bird in the scavenging mode is neither feasible nor sustainable. To understand household economics and people's preference we have to understand strength and weakness of each of production system in local people's perspectives.

SWOT analysis of *desi* and Broiler farming system in the state –

Desi poultry

Strengths <ul style="list-style-type: none"> • Low cost of production • Least labour required • Minimal working capital • Uses local resources effectively • No dependence on outsider for input supply • Preserves diversity of poultry species • Low pathogenicity • Least use of medicines and toxic materials • As scavenger cleans environment • Traditional skills and part of culture • High demand and price • Both eggs and meat are produced 	Weaknesses <ul style="list-style-type: none"> • Slow body weight growth • High mortality • Household level Scaling up not possible • Prone to Predators attack • Selection of improved and high performing birds not promoted • High production cycle (Maturity age)
Opportunities <ul style="list-style-type: none"> • Selection can improve production • Vaccination and regular deworming can reduce mortality • Feed supplementation can enhance body gain • Layers can be promoted to get eggs • Local value chain can be strengthened • Can be branded as Organic poultry meat 	Threats <ul style="list-style-type: none"> • Reduced interest with urbanisation • Shabby look of farming making youths disinterested • Subsistence nature could not attract investment

Broiler Farming

Strengths <ul style="list-style-type: none">• Standardized operational process• Has high scalability• High feed efficiency• Proven successful to meet demand and control price of poultry	Weaknesses <ul style="list-style-type: none">• High dependence on outside input supply• Requires high investment in housing and feeding• Use of chemicals and antibiotics gets manifold increased with time• Local diversity of poultry gets reduced• Only meat focus , eggs are not produced
Opportunities <ul style="list-style-type: none">• Rural gainful employment can be generated• Demand deficit of poultry meat can be met• Cluster based input & service linkages can be promoted	Threats <ul style="list-style-type: none">• Poor farmers may get in clutches of private business player as dependency for input is high• Terrain of hilly state makes some area unviable for business linkages• Storage of broilers after 45 days difficult as feeding cost soars up• Village environment may get polluted

Family backyard poultry is rarely the sole means of livelihood for the family but is one of a number of integrated and complementary farming activities contributing to the overall well-being of the household. Poultry provide a major income-generating activity from the sale of birds and eggs. Occasional consumption provides a valuable source of protein in the diet. Poultry also play an important socio-cultural role in many societies. Poultry keeping uses family labour, and women (who often own as well as look after the family flock) are major beneficiaries. Women often have an important role in the development of family poultry production as extension workers and in vaccination programmes. For smallholder farmers in dev

Preproduction stage – Inputs and process

Inputs

Desi poultry farming inputs requirements are limited whereas broiler farming is dependent on many inputs, whose supply channel is still in a nascent and unorganized phase in the state.

Breeding Stock

The available livestock census indicated that *desi* poultry bird had a wider rearing preference; however there has a recent upsurge towards broiler and kuroiler breed as well. Within local breed there is significant difference in size, feather colour and weight gain at various age.

Some of prominent poultry breeds observed in field are as below –

Kuroiler Poultry



Local (Desi) breeds of poultry



Broiler Poultry



Table 2: Production performance of Desi and improved poultry breeds –

Productivity criteria	Local Breed (Dual Purpose)	Kuroiler(Dual Purpose)	Broiler (Meat purpose only)
Weight at 12 weeks	744	1.5 kg	2.0 kg
Age at first Egg laying (Days)	200	168 days	NA
Egg production per hen per year	80 to 100	150 eggs	NA
Average weight of egg (gram)	40	55	NA
Hatchability percentage	55		NA

Starter Feeds

Desi chicks hardly receives any starter feed in the present rearing system and most often they scavenge with mother hen to get feeds. In Broiler poultry, use of starter feed for Day Old Chicks (DOC) has been commonly practiced. There are poultry feed companies like Amrit, PRIME, SAMRAT which makes and supply starter feeds for poultry chicks.

Shed Requirements

Housing for backyard poultry is constructed using low cost locally available materials. It is essential to house poultry on a raised bed to prevent predator attacks at night.

The community had also used local material to *design* broiler and kuroiler rearing houses, although basic principles of improved poultry houses had been followed.



Small Farmers



Medium Farmers



Large Farmers

Water

Desi poultry are well adapted to available water sources and most often drinks water from water sources while roaming around during the day. However improved poultry farming like that of broiler, requires clean water availability throughout the day. However bedding material is used in poultry house and hence water requirement for cleaning of floor is not required.

Through focused Group Discussions (FGDs) and household survey it had been found that availability of water is not perceived as major constraint by community in poultry farming.

Labour

Backyard poultry farming of *desi* hen requires labour for weekly cleaning of shed and opening sheds in the morning and closing in night. The labour cost significantly increases once the family adopts broiler farming since regular feeding and watering is required. It had been observed that almost 100% labour for backyard poultry production is contributed by women. Women also performs role in sale of poultry in local haats, however the role of men in poultry sale was almost equal basis. In contrast, commercial poultry farming becomes largely a family business and both perform almost an equal role in production. However men take a more active role in medication and trading than women in commercial poultry farming

Box 2: Why poultry belong within women smallholders' domain^α

Women are involved in smallholder poultry production for three main reasons:

First, when compared to larger livestock, poultry do not require much investment. As they are usually left to scavenge for their feed during daytime, they only require a little supplementary feeding (depending on the season of the year), a night shelter and, occasionally, some veterinary treatment and vaccination. Moreover, in contrast to larger animals, poultry are not highly valued in terms of social capital, i.e. the prestige the animal brings to its owner. Depending on the locality and its livestock-keeping traditions and cultural norms, men usually prefer keeping larger animals such as goats, sheep or, better even, cattle. Although women smallholders may keep a few goats, it is usually the man who creates the conditions for investing in buffalos, cattle and large flocks of goats and sheep (Villareal, 2001; Joensen, 2002; Thomsen, 2005). Poultry, on the other hand, requires little initial investment and generates quick and frequent returns, something which fits well with the types of day-to-day expenditures – food stuff, schoolbooks etc. – that women smallholders face as the main household caretakers (Todd, 1998, Thomsen, 2005). Also, the size of any potential economic loss in the event of theft, predation or disease among the animals is less with chickens (although poultry, due to their small size, are of course more easily taken by predators or stolen than are cows or goats). For all these reasons, poultry are generally accepted as “women’s capital” (Villareal, 2001). As an example, Altamirano (2005) reports that women of the Bolivian highlands prefer chickens to other, larger, animals. Although they are also the ones to take care of the family sheep, goats and pigs, they have to consult their husbands with respect to decisions about the use of these animals. In the case of chickens, the women themselves may make decisions about consumption and sales. **Second**, poultry are kept at the homestead. Poultry keeping is, thus, an activity that the women can undertake without having to leave the household, where they will usually be occupied by domestic duties such as cooking, cleaning and caring for children. As such, they do not have to allocate a lot of extra time to managing the poultry (the daily cleaning of the poultry house, feeding, etc.) as compared to other income-generating activities, such as day labouring or petty commerce, which require them to leave their homes for many consecutive hours (e.g. Bush, 2006; ACI, 2007).

Third, in places where religious beliefs or societal norms require that women do not leave their household compound or village, at least not without being accompanied by a male relative, poultry keeping is a suitable income-generating activity. This is because, as mentioned above, the tasks related to poultry keeping can be carried out without leaving the home. However, in such cases the women will still depend on male relatives or intermediary yes for the marketing of their poultry products (Seeberg, 2003; FAO 2003b)....

^αFAO. 2010. *Smallholder poultry production – livelihoods, food security and sociocultural significance*, by K. N. Kryger, K. A. Thomsen, M. A. Whyte and M. Dissing. FAO Smallholder Poultry Production Paper No. 4. Rome

Cost of the inputs

The initial input cost for *desi* poultry include initial stock investment and housing. Since the birds are reared in a free scavenging mode, feed cost comprising household surplus is minimal. In case of broiler rearing, major cost components include feeding and housing.

Table 3: In a typical 300 broiler small holder poultry farm, the cost of various input shows following trend -

System of production	Procurement cost of chicks	Housing	Feeding	Health & sanitation
Scavenging - <i>Desi</i> poultry	50%	35%	15%	Nil
Broiler farming (Small scale)	20%	40%	35%	5%

An important factor that must be considered (or understood) is that investment in broiler farming is almost 10 times more than local poultry with similar numbers. However cycle of production of broiler farming (60 days) is much lower than normal cycle (180 days) of local poultry farming.

As evident from table, major cost in broiler farming happens in feeding and significant working capital is required to manage feeding cost. Investment in housing is one time cost and broiler farming requires a bit elaborate housing than local poultry.

Market feed is available for broiler farming. In local poultry farming since chick to adult, have no standardised feed formulation and community largely focus on carbohydrate requirement neglecting much needed protein requirement of local poultry, which is supposed to work as limiting factor for egg production.

Finance

Both broiler and kuroiler farming have high capital investment both in terms of fixed cost as well as variable cost. However return in stable market condition and good local demand is significant to attract investors and bankers. Banks have schemes to support poultry farmers but grass root implementation of schemes and services had been abysmally low.

Most of the institutional finance *designed* have taken into account only broiler farming in product *design* for cost consideration and repayment plan. The NABARD scheme on integrated poultry is applicable only to the broiler variety, so too the Rural Backyard Poultry Scheme of the state Animal Husbandry and Veterinary Department. Unfortunately *desi* poultry had not received any attention for financial help even though it has almost 90% coverage.

Process (Availability and accessibility of inputs)

Local poultry farmers of Meghalaya had simple business linkage process with small value chain. As production factors, they arrange chicks from village, make a decent poultry house in backyard, keep poultry in scavenging mode and supplements grain feeding occasionally. Poultry farmer have traditional management skills as poultry farming is a part of the culture.

However shifting to broiler and kuroiler rearing have tested business linkages of poultry farming as families have to depend on outside chick supply, feed supply and medicine linkage. Input linkages for broiler farming is still in evolving stage and need proper alignment to make it timely, door step and cost effective to enhance competitiveness of broiler farming in the state.

Table 4: Current available sources for poultry chicks

Sl. No	Name	Location	Capacity/ Week	Type	Avg. Price/chick
1	Government owned hatchery	Williamnagar, East Garo Hills	5000/week	Kroiler	32
2	Government owned hatchery	Tura, West Garo Hills	1000/week	Kroiler	32
3	Premier Hatchery Pvt Ltd	Byrnihat, Ri Bhoi	15000/week	Broiler	30
4	Mukti Hatchery Pvt Ltd	Umsning , Ri bhoi	15000/week	broiler	30
5	Meghalaya Agrovat Pvt Ltd*	Mawthei, Ri bhoi	50000/week	Broilers	30
6	Government owned hatchery	Jowai, West Jaintia Hills	5000/week	Layer/ Broilers	32
7	Government owned hatchery	Kyrdemkulai, Ri Bhoi	1000/week	Kroiler	32
	*temporarily closed				

Constraints at the preproduction stage

- **Supply of chicks:** Quality chick supply at low cost is a prerequisite for poultry farming. Supply of kuroiler is limited in the state. Local chicks are mostly bought from each other in the village or at local haats. Local quality chicks with layer and meat production criteria are not available in the state.
- **Unavailability of vaccines for poultry diseases:** Poultry diseases are a major cause for loss of poultry at household level. Almost entire village poultry gets wiped out through spread of contagious diseases like Ranikhet in the village. Being under the scavenging system of production, they have high chances of infection through contact and disease gets spread across village and even to nearby villages. Requisite vaccines are not available in the state and supply and monitoring system for disease surveillances is very weak.
- **Absence of standardized feeding for *desi* poultry:** Starter, grower, brooder, finisher are stages of chicks growth, quite standardized in broiler farming. The feeding amount and content varies with production stage and age. *Desi* poultry farming has no proper feeding system and it was observed that only grains as source of carbohydrate is occasionally fed to *desi* poultry. This severely restricts production potential of *desi* poultry.
- **Absence of financial products and services for local poultry farming:** There are a few some government programs to promote broiler farming; however backyard *desi* poultry farming has not received any attention of policy makers despite majority of the households rearing *desi* poultry.

Production Stage – Activities and technology

Feeding Practice

Scavenging system of poultry production



Almost 90% poultry in the state are kept under free scavenging, wherein hens move out and search for feed in fields, waste materials, and insects by themselves. It was observed that poultry may move up to a radius of 0.5 km from the shelter in search of. No labour is required to guard these

poultry and they freely roam to take feed and water whenever they need. Sometimes they are supplemented with some home grown grains or grain by products in the morning or evening.

Kuroiler has been observed to be kept in mixed feeding regime, wherein it scavenged for some time in day and was supplemented with palette feed. Production under palette feed is more than mixed system of production.

For broiler farming palette feed is supplied by poultry feed companies like AMRIT, PRIME. Broiler farmer strongly follow the feed regime and standard feeding and water turfs had been purchased by poultry farmer.



Poultry Feeder

No use of feeders was been observed in traditional poultry farming system. Broiler farmers have kept feeder and water turf. Some innovation in feeder had been observed especially to feed adult Broiler & Kuroiler by using local materials.



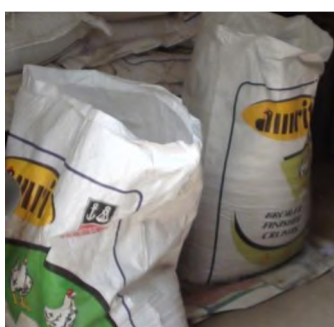
Clean drinking Water

Water requirement of birds due to high metabolic activity is significant. Water also helps in maintaining temperature equilibrium. In traditional local poultry farming water is accessed by birds themselves from any available sources including dirty water stored in grooves and near water storage.

Broiler farming drinking water turfs had been purchased and placed in poultry houses. Some local innovations of using plastic tub with iron bar protection had been observed as adaptation. It had been observed that once people understand basic concept of feeder and water *design*, they are able to innovate and adapt it to local modification, which significantly reduces cost and dependency to outside supplier.



Cost of feeding



Broiler consumes around 4 kg feed in 45 days to weigh around 2 kg. Palette feed costs around Rs 40 per kg (Rs 2000 for a sack of 50 kg).

The demand for smaller broiler weighing around 1 to 1.5 kg is more and hence around 50% of broilers are sold by 30 to 35 days. As a result, producers have adopted this process of keeping hens only for 30 to 35 day to enhance income. Some of the producers have also shared that they shift to local mixed grain feeding like maize and rice once broiler grows over one kg to reduce cost of feeding.

However cost of feeding in broiler farming comprises almost 40% of total cost of production.

In comparison, local poultry are only fed home grown grains and estimated one kg grain is fed over 4 to 5 months of the age per bird. The cost of feeding in local poultry production is almost one fourth in quantity and price is almost half of palette feed.

Management Practice

Broiler farming has a standard package of practice perpetuated by private companies and farms across the state. All inputs starting from housing to live body weight sale have been standardized.

In contrast local poultry farming has no standardised operational management process and management has been largely based on traditional practices and knowledge. As most of inputs are local, area specific management practices had been observed starting from housing, feeding, brooding to marketing of eggs and grown chickens.

Some of key management practices are observed as below –

- **Egg collection and candling** – Eggs are collected in the morning by lady of the house and kept in brooding basket. No standardized candling practice is imparted or

perpetuated in the state. Cleaning of eggs with disinfectant and storage at cold temperature is not in vogue.

- **Hatching & Brooding** – local developed conical bamboo baskets are hanged in a corner of poultry house, which is used for hatching & brooding.
- **Provision of water and feed** during natural brooding has not been observed and generally mother hen loses significant weight during brooding, leading to low egg production or delayed egg production cycle.

Disease Management

In local *desi* poultry production disease is the major constraint perceived by poultry rearer across the state and most often almost whole village loses poultry due to spread of contagious diseases in poultry like Ranikhet (new castle disease).

Table 5: Symptoms and Diseases

Major symptoms	Diseases
<ul style="list-style-type: none">• Dullness, eye closed• Loose diarrhea• Worms in faecal• Chickens huddle together• Coughing, sneezing, rapid breathing• Discharge from mouth & nostrils• Paralysis of wings and legs• White dropping• Turned or twisted neck• Swelling of head & comb• Greenish or yellow dropping	<ul style="list-style-type: none">• Coccidiosis• Salmonellosis• New castle or Ranikhet disease• fowl pox• Chronic respiratory disease (CRD) – mycoplasma• Marek's disease (MD)• Endo-parasitic infestation

Vaccines

Meghalaya *desi* poultry producers are at high risk due to unavailability of vaccines and vaccination services. Perhaps this is largest and most severe constraining factor leading to significant loss of poultry as asset to rural poor farmers.

Awareness of early disease identification, contagious disease surveillances and monitoring was almost non-existent as shared by sample respondent during the present field study.

There had been numerous and almost repeated sharing by villagers how they lost their entire flock of poultry in the previous two to three years and how they had to restock. Poultry farmers have accepted this as destiny and have developed a system to cope by resorting to distress sale and consuming poultry once disease spreads in the village.

In the case of broiler chickens, the vaccines of RD is administered and provided to rearer by chick suppliers and a private supply chain seems to have been established for vaccines and medicine supply.

Flock size

The sample study showed that 60% of *desi* poultry rear less than 25 poultry birds making it a subsistence activity. 25% rearers have been rearing 25 to 50 birds and hardly 15% crosses 50 birds rearing. It is reflected that many of those having more than 50 have again moved down due to sudden loss of poultry. Most often fear of disease works as constraint to upscale *desi* poultry farming in the state. Ironically 90% rearer who are engaged in *desi* poultry farming have received negligible mainstream support for business.

In broiler farming 70% of sample studied have kept 200 to 300 birds and 30% sample had between 300 to 1000 birds at a time. Similarly kuroiler rearing have average flock size of 40, ranging from 10 to 150 birds at a time.

However no specific layer farming at household level was observed on commercial scale and *desi* hens had been reared with dual purpose of meat and eggs both to meet state demand.

Constraints at the production stage

- **Lack of Vaccines & vaccinators:** *Desi* Poultry farmers of the state are in dire need to vaccinate their poultry against major communicable diseases to protect and enhance productivity. Incidences of communicable diseases almost wipe out poultry from the village and then again poultry farmer build their flock from scratch. This had severely restricted the investment and up scaling of backyard poultry. Absence of skilled vaccinators also restricts farmer to access it from outside.
- **Lack of *desi* improved layer chick supply units:** There is hardly any selective layer farming at village level in the state. The state is severely short in egg supply and local eggs are sold as high as Rs 7.50 each. But supply of layer chicks is a constraint in the state. The state has significant diversity in terms of productivity of poultry but local selection and propagation is not promoted due to absence of a local mini hatchery or cluster level community hatcheries.
- **Lack of standardized management practices for *desi* hens:** Management practices for local hens has remain traditional and of subsistence nature. In spite of high price growth in the demand of *desi* hens, proportionate growth in management to enhance productivity has not happened. Due to traditional practices productivity of local hens get adversely affected.
- **Absence of preventative health care services:** Herbals and first aid is neither available nor accessible to poultry and the situation is worse in the remote villages. Being a small bird of relatively low cost, mainstream health centers could not provide individual bird health care. As alternative poultry health care is not available, risk in decentralized village level poultry farming is high in the state.

Post Production Stage – Storage, Marketing and Value Addition

As poultry is largely produced in a decentralized household level production system in villages, a village to urban centers supply chain operates in the state. There are various actors involved in this process. In case of local poultry production, small village level traders and mostly women are involved whereas in broiler supply chain small town based male trader plays the key role.

Storage

Storage practices/methods

Live poultry is the major traded product in the state. People have traditional bamboo basket, which is used to carry 10 to 15 birds from village to nearby small town. The village level traders have made a small enclosure to store purchased poultry. As the village *haat* is organized weekly, storage time varies from one day to six days depending on the time of procurement. The village level trader also stores some poultry for local sale within the village and hence 10 to 15 poultry are kept in storage at any time to meet local requirement. Based on discussions, it is estimated that 5% storage loss might happen as feeding in storage was not up to mark. A weekly cost of Rs. 10 per bird is incurred during storage.

For a retail seller, poultry is slaughtered when either the consumer visits shop or shopkeeper process some poultry based on estimation of day's sale. It was reported by a few poultry meat seller mostly in semi urban areas, that they use freeze to store in case of sale not happening. However such stored poultry meat goes to dhabas & restaurant with around 10% less market price. Hence storage on one hand increases cost of refrigeration and reduction in sale value. State has high preferences for hot meat and cold stored or frozen meat is not in vogue.

Access to storage practices

The facility for frozen poultry meat or storage is only individual and by using domestic refrigerator in limited instances. Collective and advance technology based poultry meat storage is not available to the poultry meat seller.

Similarly no egg storage facility was observed in the state. In fact demand for local egg being high, there is hardly any surplus to store. Most often eggs come from outside state (Andhra Pradesh & Punjab), which has distribution channels and bulk traders, who store it individually.

Grading

Desi poultry or coloured bird invariably fetches higher price than white coloured broiler. Hen of around 1 to 1.5 kg is more in demand and sold on estimation as well as weight basis. It had been observed that around 80% local chicken sale in state happens based on estimation basis. However in case of broiler, weighing balance is used at farm to weigh and decided price based on per kg live body weight rate. Grading based on non-use of chemicals & pesticides are not explicitly visible in the market. Similarly vigour and pest loads are not grading criteria.

Local Value addition

Almost 100% eggs and 80% poultry are consumed locally in case of *desi* poultry production. Local value addition happens in terms of selection of right age saleable poultry, transport to local haat, slaughtering and cooking. Around 20% poultry goes to trading channel from village to local city and big cities.

Marketing

The state has high demand and demand is in situ (Village itself consumes of 60%, poultry produced). High local demand is an idealistic condition for poultry since cost of transportation, marketing, promotion, storage, processing is saved and producer enjoys significant price share of each rupee consumer paid.

Skills of processing of poultry like manually slaughtering, cooking is prevalent with each household in the state and hence dependence on external processing is very low.

Market Access for the products

The product has high market accessibility and almost 80% of the product gets sold locally. In case of local sale in the village, of the price paid by the consumer almost 100% goes to the primary producer, making it a profitable venture.

However as poultry is many a times sold for emergency cash, village level traders have been on the rise in the state, who procures poultry from producer, store it and then transports to city meat shops. As aggregation is low, traders take advantage of product demand by charging a significantly high price from institutional buyers like for marriage party, hotels. A case study of local aggregator has shown the margin share by producer and aggregator/local trader in added in the annexure 3.

Market Norms

The *desi* poultry market is largely informal in nature and regulated by local *haats* and informal systems. Broiler market is also largely informal in nature but of late, there has been an initiation of a formal marketing system coming in place as bulk traders are entering into broiler poultry purchase and sale.

Local Poultry market follows estimation based pricing norms in contrast to broiler farming where weight based pricing has been a norm.

Weight based pricing norms help in estimating price and keep tab on return and investment analysis. It promotes efficiency of feeding and management as growth in body weight can be translated to economic value and financial status of enterprise can be known at any point of time.

Market Regulation

Poultry market has been largely unregulated in Meghalaya. Of late as broiler farming has been on the rise, some hygienic issues at village level production units have attracted the attention of the local village council in some cases. The case of Meghalaya Agrovets Pvt Limited is a prime

example. The unit has been forced to stop its operations in the plant since it was discharging effluents into the river. It has since committed to the local community to install a waste treatment plant before resuming its operations. Some village councils have objected to establishing backyard broiler farming in the absence of proper measures to limit hygiene and waste management issues.

Market information – access and use by the community

There is no formal process of market information of poultry and it operates as informal sources. As local demand is high, a local system of information may suffice the need to the state.

Value Addition

Value Added Products

There is high scope of infusing systematic process of *desi* poultry production and branding it as organic poultry meat production system. Local poultry already have high demand and preferences, but low production due to high mortality and inefficient feed supplementation has led to negative thinking and apathy towards it.

There seems scope of promoting traditional products of Meghalaya chicken like smoked and bamboo cooked poultry products at national and international level. Cooking poultry meat with ginger and garlic pieces with least use of powdered masala is a unique preparation and may be promoted as low cost tasty produce for tourists and visitors to the state. Chicken soup in sachets may be a produce worth to be promoted.

Constraints at the post production stage

- **Absence of certification of organic poultry farming and non-use of chemicals/pesticides:** *Desi* poultry promotes efficient use of local resources and performs significantly well in low cost production regime. However their effort on without chemical use and natural feeding system hardly gets rewarded in terms of pricing in proportion..
- **Absence of live weight pricing system in *desi* poultry:** *Desi* poultry are sold on estimation basis in haats and at village level. This reduces efficiency in production system of *desi* poultry. Broiler poultry adopting of weight based price had been almost a norm.
- **Poor Transport facility for poultry products:** Poultry have inherent disadvantage of demand and supply balance, which drastically reduces prices in a given market as storage potential of broiler poultry is low and high cost incurred. In such developing scenario, poor transport is hindering broiler farming in the state.
- **Lack of storage and transport for local eggs:** *Desi* eggs are highly valued and have a good demand. But productions have not picked up in the state as storage and transport for egg is absent. Institutional Support mechanisms

Institutional Support mechanism

Infrastructure

Poultry farming business infra-structure largely comprises of hatcheries to supply chicks, health care services through veterinary clinics or mobile units, Pallet feed supply units, basic transport for input supply and output sale, training and sales counter/places.

The State AH and Veterinary Department have a central hatchery cum poultry farm at Umsning, 4 veterinary hospitals, 74 dispensaries, 59 veterinary aid center, 15 mobile dispensaries and 3 vigilance units. Most veterinary centers in the state are ill equipped and poorly staffed.

The department runs 10 poultry farms to supply improved chicks to farmers and have a dedicated training institution. However accessibility, acceptability and affordability all three remain constraint for use of available infrastructure for poultry farming in the state.

Present cluster based Veterinary Hospital (VH) is not able to cater regular support to poultry farmers.

Input supply

Private sector players like Premier Hatchery, Amrit Hatchery and Feeds, Meghalaya Agrovets (P) Limited are present in the broiler chicken farming business. Their locations and capacities have been mentioned above elsewhere. Being close to Assam, Garo hills receive services of such many Assam based private players. Poultry is preferred activity in South and west Garo hills and Ri Bhoi district. West Khasi hills had also shown good growth broiler poultry farmers in last five years.

Private hatcheries have set up own system to supply day old chicks (DOCs) and feed to willing poultry farm entrepreneurs on commercial linkage basis. Similarly poultry feeder and water turf are available by private actors.

However unless poultry farm develops in clusters supply of input incur high cost in transportation and timely supply was reported a problem by poultry farmers.

Technology Transfer and capacity building

Technology plays a vital role in small holder broiler farming and this is presently propagated through three important sources –

- Private suppliers like hatcheries who along with input also provides basis doorstep training and handholding support,
- Existing poultry farms from where kin and kith learns nitty-gritty of farm operations and
- Government training programs where organized training happens. A set of farmers also have migrated and worked in poultry farm outside state and learnt basic management skill.

However state led technology transfer had been weak due to least participation of community in the program. Capacity building required regular knowledge up gradation, demonstration and experimentation in field, which has been absent from capacity building menu of state run programs.

Training and technical assistance situation

Two vocation training centers have been established in the state – one at Kyrdemkulai in Ri Bhoi and another at Tura in Garo hills. There are training institutes and community based organization including NGOs, conducting technical training of rural youth, SHG members on poultry farming.

However contextual content modification, use of interactive tools, use of audio visuals, case study based learning has remained very limited as part of training methodology and process.

Meghalaya has regional variation in language and cultural aspects, it will be important focus on picture/video based training gets more space in methodology and local case studies form part of training and learning materials. Experiential learning through creating learning platforms for poultry farmers can be effective tool to develop context specific technologies and process.

Concept of Farmer's Field School may be adapted to enhance learning with appropriate training and learning materials.

However at present it had been observed that training has remain a conduit to access loans and services under schemes rather than learning agenda for the participants. Opportunity for hands on learning and demonstration of improved technology had been very limited if not absent in most of training programs whose feedback solicited from poultry farmers.

Constraints in institutional support

- **Absence of small holder poultry farmer organization**

There had been effort under various programs to form Self Help Groups (SHGs) of men, women and youths in village. However aggregating activity wise group from these SHGs or forming poultry farming specific group was not observed on scale. It makes sense in the given context to form village level poultry farming groups out of SHG members and provide intensive training and exposure to enable them to plan investment in poultry farming. For broader business linkages cooperatives of such members or producers may be thought of. One such Mendipathar Multipurpose cooperative was observed in Garo hill region where poultry farming had been taken on cooperative mode. Such cooperative can help poultry farmers on input supply services and marketing end. PRADAN³ promoted small holder poultry cooperative can provide a guidance to organize broiler poultry farmers in the state and provide backward and forward linkages.

- **Non coordination between private business stakeholder and government effort**

Private business player has been playing an effective role of broiler farming in the state through supply of broiler chicks, poultry feeds, training and marketing but coordination between government and private player is nonexistent in the state.

Absence of micro planning and less community participation in service delivery and quality monitoring

It had been found that community participation in present service quality monitoring is very limited. Regional diversity of state requires micro planning to effectively integrate local resource based poultry development plan but present top down approach have hindered context specific participatory plan development

³ PRADAN (Professional Assistance for Development Action) www.pradan.net

Policy and Advocacy

Village poultry production has remained largely neglected by policy workers, extension services, veterinary services, researchers as well as training and research institutions. The positive results obtained by investing in training and providing veterinary services especially in Bangladesh has seen a gradual shift in policy thinking. However, poultry rearers in sector 4 continue to be marginalized.

Minimum Support Price

Broiler poultry farming is a high risk venture due to high feed cost investment and fluctuating price. To develop this sector, government may facilitate through a poultry farmers' cooperative a risk capital, where broiler farmers contribute and gets a minimum support price from sudden price slow down. This will be more important once broiler farming picks up further in the state.

There are two grey areas where minimum support price can help – One is minimum support price for maize, which is a major component for the feed industry. Either the government can facilitate local poultry feed production in the state (Complimentary feed for local poultry and complete feed for Broiler poultry) or provide minimum support price to maize growers so that production of maize can be enhanced in state and poultry feed can be made available.

Second area of minimum support price is procurement of broiler poultry on a pre declared price and sale to consumer. One such model had been implemented by PRADAN (Professional Assistance for Development Action), an NGO working in Hoshangabad district of Madhya Pradesh in Kesala block. As a *modus operandi*, a poultry cooperative facilitated by PRADAN, declares a price of poultry quarterly and provides chicks to rearer on a fixed price. Once crop is ready, Cooperative procures poultry as pre declared rate and market it collectively through retailing or institutional sale. Poultry farmers are getting declared price thus saving them from fluctuation of market rate.

However cooperative makes profit in some of cycle (when market price is higher than declared price) or loss in a few sale cycle (if market price comes lower than procurement declared price). However due to collective sale, farmers are ensured a minimum price and cooperative becomes a larger player to influence market price to an extent. Date of procurement and market supply to local and distant market is regulated in such a way that poultry price is maintained to a favorable level.

Even planning of chick induction is done properly and well in time so that produce is procured in cycle and each day market supply is regulated as per seasonal demand and favorable seasons.

Details operations can be availed from National Small Poultry Holder federation or PRADAN (www.pradan.net)

Constraints at the Policy and advocacy level

Some of critical policy constraints are

Supply of New Castle vaccine and vaccination to small local poultry farmers – Contagious diseases are playing its toll almost every three years to poultry farmers in different villages. Small *desi* poultry farmer are worst victims as they loss major chunk of adult poultry. Looking

into significant livelihoods dependence of the state, production and distribution of vaccines seems imperative to safeguard and strengthen this livelihood.

Ambiguity between backyard poultry and broiler promotion

The existing state policies largely cater to organized broiler farming. The unorganized backyard *desi* poultry farmer, which formed large chunk of small producers remain out of purview of mainstream policy and programs.

The focus on organized broiler farming leads to apathy towards village poultry chicken production system, which adversely affects large number of backyard poultry farmers, which may be key driver to poultry production in the state.

Less focus on improvement of poultry breed for backyard farming

Local poultry breed of the state has not been considered for selective breeding and developing a context appropriate breed suitable for backyard farming. Kuroiler has not been introduced in the state as backyard breed however management practices improved proportionately nor has the supply line of kuroiler been able to meet state demand.

Technical Human resource for Nursing and management of poultry farms

The state lacks extension staff and qualified technical professionals with gender equity for improved livestock farming. A special focused program can go a long way to ensure availability of such technically qualified human resource at affordable cost and door step service.

Recommendations

Based on extensive field work, sample studies and stakeholder's views analysis, study proposes to take a short term and long term plan to strengthen existing ecofriendly backyard poultry farming and promote organized broiler poultry farming as profitable business venture. Broad recommendation based on study findings stresses following important steps to be taken to strengthen poultry based livelihoods -

Inputs and Preproduction stage

As discussed under constraints faced by poultry farmer at pre-production stage following suggestions emerge –

- **Develop a standardised package of practices for backyard *desi* poultry farming:** Meghalaya has strength of culture to rear backyard poultry. Backyard poultry farmer due to its wide spread scale had been rearing almost 90% of poultry bird in the state. However practices and systems like brooding, hatching, feeding, health management has remained old and could not catch up with changing times & market demand.

It will add significant value if modern poultry management science can be infused in traditional system so that strength of both can be synergized. A standardized package of practice in terms of improved feeding, flock selection, brooding can help it to grow from strength to strength.

- **Promote Village based mini incubator/hatcheries for *desi* hens on entrepreneurship model:** To ensure breed diversity and selecting best out of local breed, a performing hen eggs can be incubated and hatched within village to supply chicks to willing families. This could work like rent based hatching, wherein family provides eggs of best performing hens and gets Day old chicks after 22days from the center. Poultry farmers pay a rent for incubating eggs and making chicks out of it.

This could save time of mother hen in brooding and can free it to produce more eggs in its life cycle. Thus farmer get more eggs and have option to hatch best poultry eggs to get chicks. Hatchability of eggs can also be increased through proper cleaning, storage of eggs, candling and proper management. Such chicks can be vaccinated at incubating center itself so that farmers are able to get vaccinated chicks.

- **Design and implemented financial products for *Desi* as well as broiler poultry farming:** Poultry farming is quire remunerative business with strong market demand in the state and provides employment to weaker sections and poor people. Appropriate financial products for modernization of traditional backyard poultry, village based mini poultry incubation center and broiler farming should be taken up a priority program by financial institution in the state.
- **Equipments for feeding and water supply to poultry:** Supply of modern equipment for proper feeding and water to local poultry should be promoted under various programs and supply ensured by private player participation as well as local innovation.

Production stage

- **Ensure supply of vaccines in cold chains:** Supply of vaccines under proper condition is most serious constraint backyard poultry farmers are facing. A within state production and supply system should be established with private public partnership model.
- **Develop large pool of poultry Vaccinators and chick vendors:** A cadre of vaccinators and chick vendors can ensure timely supply of chicks (coloured chick preferred in the state). Chick vendors can establish small farms to rear day old chicks (DOC) supplied by hatcheries for 15 to 20 days to make it strong and able to bear stress of backyard poultry farming under scavenger system. This practice had been prevalent in many other parts of country where poultry farming has grown as an enterprise. Chick vendors get promoted on business terms and act as strong supply and information flow channel to promote poultry farming.

Box 3: Contract farming^β

Contract farming involves two parties – the integrator and the grower*. The integrators are vertically integrated firms that achieve economies of scale through controlling the entire processes from production through marketing. They provide the growers with production inputs such as day-old chicks, feed, and medicines and vaccines, as well as supervisory services. Growers may be smallholders with production capacity of a few hundred broilers, or they may even be medium- or large-scale operations.

Through a contractual agreement with the integrator, the grower receives the required inputs and is assured of a fixed selling price. The contract, thus, reduces the risk the farmers would otherwise face with respect to the quality of their production inputs and price fluctuations in the market. Although contracts may differ in nature, there are normally no cash advances. The grower, thus, receives the inputs on credit and pays back upon delivery of broilers at target weight to the integrator (Patrick, 2004; Farrelly, 1996; Begum, 2005). The ACI (2007) study indicates that in Viet Nam, the Thai CP group does not provide the inputs on credit to growers. That would imply a significantly higher investment by the grower than in countries where inputs are provided on credit. On average, the contract farmers in Andhra Pradesh, India cover less than 3 percent of total input costs. There are in-built penalties for lack of compliance with contract outputs, so farmers do not default on delivery dates, average weight or quality of the broilers, and do not sell off the birds to external buyers (Ramaswamiet al., 2006).

The integrators benefit from the contracts as they are able to maintain tighter control over all the vertical stages of production, including the inputs used, the quality of the final product and the timing of its delivery of predetermined quantities (Glover, 1987) The strength of the contractual relationship lies in the fact that the interests of the growers and the integrator are aligned by the contract. The question of which smallholders are able to enter into and benefit from contract farming and under what terms such contracts are successful has attracted some attention in the literature.

*The terms used in different publications differ to some extent. The company which provides production inputs and collects full-grown broilers for processing and marketing is referred to as the firm, the principal or the integrator. We use the latter. The farmer who is contracted by the integrator to feed the broiler chickens is often referred to as the farmer, the outgrower, the grower, the agent, or the contractor. We use the terms grower or contract farmer.

^βFAO. 2010. *Smallholder poultry production – livelihoods, food security and sociocultural significance*, by K. N. Kryger, K. A. Thomsen, M. A. Whyte and M. Dissing. *FAO Smallholder Poultry Production Paper No. 4. Rome*

Promotion of poultry vaccinators should be taken on mass scale so that it can be performed efficiently and well in time.

Primary health care like vaccination, de worming , treatment of minor wounds and minor ailments required quick, on first symptom, in low cost with focus on prevention rather than cure can be achieved through training local men and women.

Post Production stage

- **Develop and brand backyard *desi* poultry farm as organic poultry production system:** Developing herbs based cure for minor diseases and standardising process can qualify present system as near to organic poultry farming. Codifying and institutionalising a set of management protocols for backyard poultry production system and branding it 'organic' /'free range' can be attempted to fetch a better return to farmer and entry to premium market.
- **Certification of non-pesticide, non-chemical used healthy poultry produce:** Broiler farming, once shifted to commercial scale have high chance of adopting high chemical use (Cleaning, disinfectant, parasite control, antibiotic use), keeping high density of poultry to enhance production. However such practices will adversely affect village micro and macro climate of the state and may adversely affect human health. It shall be prudent if certification of such 'no adverse production' system is promoted to safeguard interest of consumer and enhance higher return and incentives for compliance of such system.
- **Market information system:** Create a SMS based system to make aware villagers about prevailing rate of input and output (chicken) cost at various markets and by various players, so that an informed choice can be made by villagers and exploitation gets minimized due to ignorance. Such local language SMS can be sent as updates to registered poultry farmer.

Institutional support

- **Identifying poultry clusters and organizing poultry farmers at village and cluster level:** Poultry farming as a business require significant interface with market for input and output. Aggregation of demand or supply can only be facilitated once farmers are organized in some formal structure. Mendipathar experiences may be replicated on wider scale.
- **Developing participatory learning tools & a learning platform -** A participatory learning platform based on visual tools and discussion points can be prepared as training learning tool for improved poultry farming. A participatory research and demonstration can be planned by this group every month to propagate context useful knowledge and experiential learning.
- **Support private player's role in business linkages –** Private players should be involved in providing services like chicks, feed, vaccine and training to strengthen service quality under competitiveness regime.

Box 4: Building economic and social capital for women through poultry

The income from backyard poultry is often described as farmers “petty cash” (Rustom and Ngogi,1999) but continues to remain an important source of income for female members of the household. This is because for most women this remains the sole means of income generation and can be managed as a side activity in addition to other household chores. The money from poultry is used by women for buying food items, for childrens school fees. Some women have been known to exchange them for larger animals such as goats. Women who take part in micro credit programmes use the earnings for repayment as well as for investing in other income generating activities (Aboe;Zoma 2006). Any poultry development project must recognize the role of women in this specific activity. Development interventions involving women can include:

- Training women in poultry health care as extension agents
- As suppliers of quality chicks at a cluster level
- Women specific micro credit schemes targeted at backyard poultry.

The importance of backyard poultry needs to be seen in this context of providing economic empowerment to women rather than the quantum of income the activity generates vis a vis the total household income.

Conclusion

The field studies and literature review have shown approximately 80 percent of rural households in engage in smallholder poultry production, of which the majority is in Sector 4. While backyard poultry production is not the mainstay of livelihoods in any wealth category, but poultry provides a contribution to household income that can be very important for poor households. The view that poultry is the livestock of the poor is confirmed by studies that examine the relationship between wealth groups on the one hand and share of poultry income relative to overall income on the other. The poorer the household, the higher the share of income derived from poultry keeping.

Agricultural communities experience seasonal income fluctuations. The use of “poultry savings”, also termed “livestock banking”, is one way of mitigating income deficits that may occur in certain seasons. Income smoothing through poultry sales is an important function of poultry in smallholder societies, and because of this role as a form of small savings, poultry are often kept beyond the point at which they could best be marketed. Meeting expenses related to children's school attendance, health care and the like are noted as occasions when “poultry savings” are cashed in. As there is a great risk of loss attached to “poultry savings” due to high rates of mortality, the uses of poultry for this purpose indicates that no or few other saving mechanisms are accessible.

There needs to be a concerted policy shift to structure development interventions in the area of backyard poultry where women play a crucial role. Inputs, Structures and Processes that augment backyard poultry production must have the gender dimension in the development intervention.

Despite the sociocultural role of poultry in smallholder life, this is often underestimated in development-related literature and in actual development projects, which tend to focus on technical aspects of production and on the economic benefits of livestock keeping. However, without considering the social and cultural aspects of smallholders' livestock keeping, there is a risk that development interventions will fail to provide smallholders with the appropriate assistance. This is because, where livestock keeping is concerned, smallholders do not act only on the basis of economic rationales, but also seek to fulfil their social and cultural obligations towards kin and fellow community members. Fulfilling such obligations contributes to building and maintaining social capital, which is part of the asset structure in rural livelihoods.

The **implication** for development interventions is, therefore, to acknowledge the importance of such practices and accept that poultry will not necessarily be marketed at the economically optimum time.

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Annexure1: District wise population of Poultry in 2007 has shown following trend

Sl. No.	Name of Districts	Fowls			Ducks			Turkey	Grand Total
		<i>Desi</i>	Improved	Total	<i>Desi</i>	Improved	Total		
1.	East Khasi Hills	417099	53292	470391	4492	370	4862	-	629036
2.	Ri – Bhoi	312519	27422	339941	2739	1771	4510	12	344451
3.	West Khasi Hills	457059	37166	494225	2727	1285	4012	-	498237
4.	Jaintia Hills	329824	37479	367303	5704	1832	7536	-	374839
5.	East Garo Hills	505718	88695	594413	4671	659	5330	-	599743
6.	West Garo Hills	565964	25131	591095	36037	1904	37941	-	629036
7.	South Garo Hills	164816	4313	169129	2032	155	2187	-	171316
	State (Overall)	2752999	273498	3026497	58402	7976	66378	12	3092875

Annexure 2: Comparative Household economics of Backyard *Desi* bird farming and small scale Broiler farming –

Estimated Economics of Backyard <i>desi</i> and small scale Broiler farming						
A. Fixed cost	Backyard <i>Desi</i> Hen farming			Broiler farming		
	Unit cost	No of units	Cost (Rs.)	Unit cost	No of units	Cost (Rs.)
Breed Type	<i>Desi</i>			Improved		
Production Cycle	6 months			2 months		
A1. Housing	2000	1	2000	35000	1	35000
A2. Feeding manger	NA	1	0	450	2	900
Total A			500			35900
B. Recurring cost						
B1. Cost of parent stock/ chicks (DOC for broiler & 90 days for <i>desi</i> hens)	100	50	5000	35	300	10500
B2. Feeding cost chicks to saleable age	16	50	800	20	1050	21000
B3. Health care cost	50	0	0	2	300	600
Total B			5800			32100
C. Other costs						
C1. Interest on capital @ 12% (6 Months)			30			718
C2. Depreciation of Fixed cost @20% annual			100			7180
Total C			130			7898
Gross payments (B+C)			5930			39998
D. Receipts						
Mortality		25%			10%	
Sale of hens & cocks	450	38	17100	270	250	67500
Sale of manure			500			500
Sale of eggs	380	7	2660			
Gross Receipts			20260			68000
Net profit			14330			28002
Monthly profit			2388			14001
Per bird profit			47.8			46.67
Per live bird profit			64.55			51.86
Investment required			6300			68000
Profit as ratio of investment			2.27			0.412

Annexure 3: A case study

Place – Shangpung, Mawlibang

Block – Laskein

Name of trader – Ms. Renota Suna

Years in business –16 years

Average daily live poultry sale

Summer – 30 to 40 poultry per day

Winter – 80 to 100 poultry per day

Sales to – Urban consumers, institutional bulk buyers (Only coloured bird)

Cost items	Cost paid (Rs.)
Purchase of poultry from village or local haat @Rs 250 per kg (average 1.5 kg live wt) – average purchase 10 hens	3750
Cost of haat travel & transport – Public vehicle	100
Cost of feeding at home (during storage)- Average 6 days	200
Total cost of 10 poultry procurement	4050
A. Procurement cost per kg	270
Storage & Selling cost	
(Shop rent) – estimated as uses her own house to sale	100
Maintenance of poultry storage house , cleaning	50
Total cost	150
B. Per kg cost @ 50 kg	10
Total per kg cost of poultry meat (A+B)	280
Consumer paid per kg price (Ranges Rs 300 to 350)	300
Profit per kg	20
Profit if 40 poultry sold per day with estimated 1.5 kg live weight	1200

Estimated percentage of payment shared between the desi poultry rearer and local trader