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INDIGENOUS CHICKEN PRODUCTION IN PUNJAB: A DETAILED SURVEY THROUGH PARTICIPATORY RURAL APPRAISALS

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ABSTRACT

The present study was designed to understand role of indigenous chicken in livelihood of rural masses, traits for which it is preferred and documentation of production constraints at two experimental sites in Punjab (Pakistan) through participatory rural appraisals. Gender sensitivity was accounted for conducting these appraisals. Main purpose of chicken keeping was home consumption and income obtained from extra sale of chicken and eggs was mostly kept by women and household heads which they spent on family needs and investing back on livestock/poultry. Differences among men and women's perceptions in keeping particular chicken breed and traits were not the same. Fayoumi and Rhode Island Red breeds were preferred for egg production, Desi and Naked Neck for broodiness and disease resistance while Aseel breed was highly ranked for its aggressiveness and economic value. The major constraints at Bahawalpur site were absence of veterinary services and shortage of canal water. Less availability of space and risk of predators were obvious at Faisalabad site. Prevalence of diseases and lack of financial aid was noted at both sites. It was suggested that provision of necessary health coverage and trainings could lead to better chicken production and an income generating activity for landless poors and deprived women of the area.

Keywords: Indigenous chicken, gender, livelihood analysis, PRA, production systems.

INTRODUCTION

Pakistan has large population of indigenous chicken well-adapted to local conditions. Majority of these chickens are reared in rural areas of the country and comprised of Aseel, Naked Neck, Fayoumi, Rhode Island Red, Desi (non-descript) and their crosses. These birds are generally kept by poor families and more often reared by women and children. Indigenous chicken are more abundant among rural areas than commercial layers and broilers. These birds provide significant proportion of poultry products in spite of being lower in egg and meat production as compared with commercial strains (Kitalyi, 1998; Tadelle *et al.,* 2003). The low performance of indigenous chicken along with socio-economic changes, natural disasters, farmers' preference for exotic breeds and lack of conservation policies are resulting in the loss of local animal genetic resources in developing countries (FAO, 2007). Local breeds are not only important for sustainable production but also for unpredicted breeding requirements of the future (Horst, 1989; Romanov *et al.,* 1996; Besbes, 2009). To achieve these objectives, a regional project "Development and Application of Decision Support Tools to Conserve and Sustainability Use Genetic Diversity in Indigenous Livestock and Wild Relatives" was executed in four countries *i.e*., Pakistan, Bangladesh, Sri Lanka and Vietnam. The expected outputs from this five year project were to develop and evaluate: appropriate breeding tools for low input production systems, effective tools for cost-benefit analysis of breeding programs for alternative breeds, analytical frameworks for assessment of policy and marketing options for FAnGR (Farm Animal Genetic Resources), capacity of stakeholders to apply developed decision support tools for conservation and sustainable management/enhanced use of FAnGR and their wild relatives, tools for diversity assessment and for setting cost effective conservation priorities, increased knowledge and replication strategies for FAnGR and wild relatives (www.fangrasia.org).

In each project country, two project sites were selected and participatory rural appraisals, household surveys and in-depth monitoring surveys were conducted. The results of participatory rural appraisal for Pakistan are presented in this paper with the objectives to analyze chicken production systems and livelihood resources of rural areas.

MATERIALS AND METHODS

Study sites: Present project was conducted at two selected sites of districts; Bahawalpur (Site-I) and Faisalabad (Site-II) in Punjab province. These sites were selected on the basis of high livestock/poultry units and population per square km along with distinct characteristics of agro-ecological zones; sandy desert and irrigated land, Site-I and Site-II, respectively after consulting key informants, agriculture officers and chicken keepers of the area. District Bahawalpur has an area of 24,830 km² with approximately two-third covered

by the Cholistan desert. The soils are sandy and loamy fine sand with the maximum rainfall of 300 mm. A huge part of the population relies on agriculture directly or indirectly. Three villages namely; Fateh 78 (Village I), Fateh 76 (Village II) and Murad 147 (Village III) were randomly selected from this district for research study. These villages were situated far from city and very small number of villagers works as laborers in the city. Women were actively involved in farming and rearing of livestock. Water shortage in Cholistan desert area has decreased the productivity of crops. Hence, the villagers grow food grain and fodder crops only and livestock keeping is on increase. District Faisalabad has an area of 5856 km^2 with climate varying between semi-arid to arid. The soils are sandy, loam-clay and loam and the mean annual rainfall is 300-500 mm in the East and 200 to 300 mm in the Southwest. Three villages namely; Waseeran (Village I), Dalowal (Village II) and Balochwala (Village III) located on Samundari road were randomly selected for this district. There was almost negligible industry in this area and majority of the population was involved in agriculture. It is purely irrigated land. Sugar cane is the major cash crop with wheat, cotton and vegetables being other important crops grown in this area. The common livestock species found in this area are buffalo, cattle, goat, donkey and chicken birds.

Methodology: Participatory rural appraisals (PRA) were conducted with the help of two teams of male and female each which comprised of a facilitator, an observer and a note taker. Special attention was given in the selection of teams that were able to communicate with the villagers in their local language and well familiar with the social norms and values of both selected sites. Male and female teams conducted these appraisals on the same day with 8-10 hour period a day at each village. Discussion related to project motives was made by facilitator and he/she explained and guided the issues and took key notes on flipchart while the observer cross checked the analysis templates and note taker documented the whole discussion for all participants and also reminded the facilitator about missing issues.

The sequence of activities and timings are given in Table 1. First part was open to all participants including livestock and non livestock keepers. The second part was mainly focused on those households keeping project species *i.e*., chicken and goats. About 30 to 35 men and women including 25 each of those keeping project species were invited. For the convenience two groups of the village farmers within each gender were made and partitioned information was collected by male and female teams from men and women groups, respectively.

Table 1. Sequence of activities and timing of participatory rural appraisals at project villages

Group-I	Group-II
Introduction of the project (½ hour)	
Preparation of village map (1 hour)	Livelihood analysis (1 hour)
Production systems (½ hour)	Wealth ranking (1 hour)
Break- Households not keeping project species free to leave	
Role of project species in livelihoods (1 hour)	
Market orientation (1 hour)	Breeding, selection practices and replacement strategies (1½ hour)
Actor linkages, effectiveness and interactions (½ hour)	Key constraints to livestock production and marketing (1 hour)
Wrap up of all activities (½ hour)	

The discussion was focused on type of the birds and animals the villagers were keeping. Information related to production systems and interaction among its various components for chicken/goat was collected with following features:

- Livelihood analysis with the objective of identification of important livelihood and income sources from on-farm/off-farm activities. Differences in key livelihood sources by gender or other social differentiation.
- Listing and ranking of main sources of livelihood and cash income both from within and outside the area.
- Role of different chicken/goat breeds in the livelihood to assess the number of households keeping various breeds and reasons of rearing them.
- Breeding, selection practices and replacement strategies practiced by farmers for various breeds.
- Traits of economic/social importance listed by the farmers for various breeds.
- Identification of key constraints by farmers in chicken/goat production, their causes and effects, current coping or response strategies and indication of whether efforts to address a particular problem already tried, failed or have incompletely solved the problem.

This paper is focused on indigenous chicken and all the chicken data collected through said project was analyzed using Statistical Package for Social Sciences software (SPSS, 2011).

RESULTS

Majority of the farmers showed great interest in chicken keeping at two experimental sites, giving an insight into the importance of this small creature providing food, cash and pleasure. The percentages of chicken owners were 78.2, 67.3, 58.2 and 58.2, 36.4, 49.1 in Village I, II, III at Site-I and II, respectively (Table 2). Among the 191 total households included in the survey at two sites, 188 were keeping flocks of indigenous chicken and their crossbred while only 3 observations were made for indigenous and exotic birds. The maximum number of households keeping chicken for all breeds was found in Village-I at Site-I (Table 3).

Livelihood analysis: Livelihood analysis expressing contribution of livestock (including poultry) to the livelihood, cash income and difference in terms of gender, age, ethnic minorities keeping chicken at two sites and sexes within each site are presented in Table 4.

Table 2. Number of households with livestock/chicken in selected study sites.

Site	Village	No. of HH	No. of HH with any livestock	No. of HH with chicken	Percentage of HH with chicken
I	I	55	53	43	78.2
	II	55	51	37	67.3
	III	55	51	32	58.2
II	I	55	52	32	58.2
	II	55	52	20	36.4
	III	55	51	27	49.1
	Total	330	310	191	57.9

HH=household

Table 3. Number of households with various chicken breeds.

Site	Village	HH with all chicken breeds	HH with indigenous and crossbred chicken	HH with indigenous and exotic chicken
I	I	43	42	1
	II	37	36	1
	III	32	32	0
II	I	32	32	0
	II	20	19	1
	III	27	27	0
	Total	191	188	3

HH=household

Table 4. Livelihood analysis using Chi-square test.

Role of livestock/poultry	Between Sites	Between male and female respondents at Site-I	Between male and female respondents at Site-II
Contribution to livelihoods	0.400	0.300	0.300
Contribution to cash income	0.187	0.000	0.600*
Differences in terms of gender, age, ethnic minorities	0.047	0.600	0.400

*=significant at P<0.05.

Role of poultry as a whole or a part of livestock activity was non-significant (P<0.05) in its contribution to livelihood between two sites and sexes within site (2nd in importance after cropping) but as regard to its role in contribution to cash income it differed significantly (P>0.5) between the sexes at Site-II (more important among female respondents). As far as gender, age, and ethnicity involvement is concerned there were also no significant differences between two sites and between sexes within sites (women involvement was more).

Table 5. Percentage of farmers keeping various chicken breeds.

	Site-I	Site-II
Breeds	**Mean±SD**	**Mean±SD**
Aseel	18.2±31.15	15.8±24.34
Naked Neck	21.3±25.94	17.7±19.40
Fayoumi	73.3±10.33	55.0±31.62
Rhode Island Red	69.2±14.29	47.0±31.14
Desi	45.0±24.29	71.0±13.42

Prevalent chicken breeds at two experimental sites included Aseel, Naked Neck, Fayoumi, Rhode Island Red and Desi (non-descript). People were of the opinion that some 18.2% of the people keep Aseel at Site-I and 15.8% at Site-II (Table 5). Fayoumi breed was considered to be more abundant with the farmers at Site-I (73.3%) while Desi was considered to be more prevalent at Site-II (71.0%). Male and female respondent's opinion differed significantly ($P<0.05$) for Desi within Site-I (according to female respondents, more farmers were keeping Aseel) while opinions for other breeds did not differ across sites and male and female respondents within sites (Table 6). In 'who keeps' category, opinions were similar between sites and between male and female respondents within site for all categories of keepers. As regard the purpose of keeping between sites and male and female respondents' within site, differences were significant ($P<0.05$). Males and females responded differently for income and consumption at both sites (for females, consumption and income was a purpose while for male respondents it was home consumption). There were highly significant differences between sites and sexes within sites for 'who benefits the most' (according to female respondents, household head and themselves kept money while male stated, money kept by women only). People at two sites also differed significantly ($P<0.01$) in modes of spending money however, males and females within Site-I showed similar responses (women spent money on household needs while men also invested back). About 'trends of chicken keeping' people at two sites had the same opinion with trend being same as before (though it was becoming more important at Site-I as compared to Site-II).

Traits ranking at experimental sites: Traits ranked in various chicken breeds by male and female respondents in order of their importance at experimental Site-I and Site-II are given in Tables 7 and 8, respectively. Farmers usually kept breeds based on traits they perceive to be socially and economically important. Male and female groups ranked differently in order of importance of various traits yet some of those were similar. Traits listed at Site-I were: Number of eggs, egg size, hatchability, broodiness, meat taste and plumage color while for male respondents aggressiveness/fighting trait among Aseel and Desi birds, income, number of eggs, meat production and plumage color were important. Similar traits were important at Site-II with additional trait of birds' price among female respondents and physical structure, weight and height for Aseel among male respondents. As regards the ranking of traits between villages similar ranks were given to different traits by female respondents.

In the overall ranking of chicken breeds female respondents at Site-I ranked Fayoumi and Rhode Island Red at the top along with their higher ranking in number of eggs, size of eggs and plumage color while they ranked Aseel, Desi and Naked Neck higher for hatchability, broodiness, meat taste and disease resistance. Male respondents at same site ranked Aseel at the top for almost all the traits and also included trait of aggressiveness in Aseel and higher economic value of Aseel and Desi in comparison with Fayoumi and Rhode Island Red breed. At Site-II male and female respondents ranked Desi at the top with its higher ranking for hatchability, taste of meat and disease resistance while Fayoumi and Rhode Island Red were ranked higher for number of eggs and preference was for Rhode Island Red over Fayoumi breed for size of egg. Though male respondents at Site-II ranked Desi at the top of all chicken breeds in overall ranking yet they ranked Aseel at the top for body stature, body height, aggressiveness and economic value. People also expressed their opinions regarding other aspects of the production system. Breeding decisions and selection of chicken breeds were made by both men and women. Birds were mostly replaced by purchase from street vendors if not hatched at home. At the time of purchasing chicks, no information except name of breed was asked. Info regarding disease resistance, egg production, meat production and hatchability was not available with the sellers. Controlled breeding was practiced for Aseel and uncontrolled for other breeds. Hen to cock ratio was 5.5:1, respectively during controlled breeding. Male birds were selected on the basis of their physical appearance, body stature, fighting ability, comb size, breed, plumage colour and age while in case of hen the criterion were the broody behaviour, age, egg production, clutch size and purity of breed. At Site-I Aseel cocks were sometimes shared among farmers and their hatched chicks were divided equally among the hen, egg and cock owners. Farmer themselves or some Aseel keepers were the decision makers for controlled breeding while women were the main caretaker for all the chicken activities. At Site-II sources of replacement for chicken was broody hen as well as purchase from street vendors, neighbors, friends and relatives while pure Aseels were taken directly from Aseel breeders as adult birds.

Constraint analysis: The overall major constraint faced by the respondents in rearing of livestock at Site-I was the absence of veterinary hospital in the locality. Second

major problem was shortage of canal water and heavy and salty ground water effecting crop and animal productivity. Other main constraints were prevalence of disease, lack of financial assistance, unavailability of good breeds, lack of training opportunities, theft and risk of predators (cats and jackals)**.** The most influencing constraint was lack of finance and prevalence of Newcastle disease (ND). Farmers obtained credit from informal sources *i.e.*, relatives and friends at the time of need for purchasing of chickens. The households were providing health coverage to their chicken themselves when required and were not able to meet expenses of obtaining veterinary services from veterinary hospital located in the nearby city of Hasilpur (Site-I). The suggestions from the respondents to cope with these problems were the availability of both credit and vaccination by Government agencies.

Table 6. Chi-square values for role of chicken in livelihoods of farmers.

Features[a]	Between sites	Between male and female respondents at Site-I	Between male and female respondents at Site-II
Percentage of farmers keeping various chicken breeds			
Aseel	0.003	0.021	0.037
Desi	0.344	0.600*	0.344
Fayoumi	0.109	0.000	0.120
Rhode Island Red	0.240	0.000	0.300
Naked Neck	0.122	0.133	0.075
Who keeps them?			
All	0.251	0.373	0.032
Moderate + poor	0.180	0.071	0.000
Well off	0.045	0.108	0.170
All except very poor	0.045	0.108	0.170
Why do people keep this species and breed?			
Income	0.559*	0.000	0.007
Prestige	0.338	0.000	0.352
Income & consumption	0.071	0.689**	0.685**
Income, consumption, prestige & ceremony	0.081	0.560	0.228
Who benefits most?			
Household	0.409*	0.429*	0.944**
Men	0.065	0.115	0.004
Women	0.258	0.099	1.000**
Both men & women	0.195	0.188	0.000
How's money spent on?			
Food	0.070	0.000	0.255
Food, health, education & social activities	0.040	0.001	0.685**
Food, health, education, social activities, saving & invest back in livestock	0.207	0.000	0.693**
Trends			
Becoming more important	0.005	0.057	0.147
Same as before	0.002	0.050	0.000
Less important	0.003	0.028	0.038
New activity	0.045	0.000	0.024

*, ** =significant at P<0.05 and P<0.01, respectively

Table 7.Trait ranking in chicken at Site-I.

Village	Female Respondents						Male Respondents					
		Breeds						Breeds				
	Traits[1]	Aseel	Naked Neck	Fayoumi	Rhode Island Red	Desi	Traits[1]	Aseel	Naked Neck	Fayoumi	Rhode Island Red	Desi
I	Number of eggs	2	2	1	1	2	Number of eggs	3	1	2	1	2
	Hatchability	1	1	2	2	1	Meat production	1	2	2	3	1
	Egg size	1	2	3	1	2	Aggressiveness	1	-	-	-	2
	Meat taste	1	3	2	1	1	Income	1	3	3	2	2
	Disease resistance	1	2	2	2	2						
	Plumage color	1	3	1	1	1						
	Overall ranking[2]	3	3	1	1	2	**Overall ranking[2]**	1	3	2	2	2
II	Number of eggs	2	-	1	1	2	Number of eggs	3	-	1	1	2
	Hatchability	1	-	2	2	1	Meat production	2	-	4	3	1
	Egg size	1	-	3	1	2	Fighting	1	-	-	-	2
	Meat taste	1	-	2	2	1	Plumage color	2	-	3	3	1
	Disease resistance	2	-	2	2	2	Income	1	-	2	3	2
	Broodiness	1	-	2	2	1						
	Overall ranking[2]	2	-	3	2	1	**Overall ranking[2]**	1	-	2	3	1
III	Number of eggs	2	-	1	1	2	Number of eggs	4	-	1	2	3
	Hatchability	1	1	2	2	1	Meat production	1	-	4	2	3
	Egg size	1	2	3	1	2	Fighting	1	-	-	-	-
	Meat taste	1	3	2	2	1	Plumage color	1	-	3	1	2
	Disease resistance	2	2	2	2	2	Income	1	-	4	2	3
	Broodiness	1	1	3	3	1						
	Overall ranking[2]	2	2	1	1	2	**Overall ranking[2]**	1		3	2	3

[1]; 1= very important, 2= somehow important, 3= not important

[2]; 1= becoming more important, 2= same as before, 3= less important, 4= new activity

Table 8. Trait ranking in chicken at Site-II.

Village	Female Respondents						Male Respondents					
		Breeds						Breeds				
	Traits[1]	Aseel	Naked Neck	Fayoumi	Rhode Island Red	Desi	Traits[1]	Aseel	Naked Neck	Fayoumi	Rhode Island Red	Desi
I	Number of eggs	-	2	1	1	2	Number of eggs	4	-	2	1	3
	Hatchability	-	2	3	3	1	Aggressiveness	1	-	3	-	2
	Egg size	1	1	1	2	1	Meat production	4	-	2	3	1

	Disease resistance	1	2	2	3	1	Income	4	-	2	1	3
	Meat taste	-	2	2	2	1	Meat taste	1	-	2	2	1
	Plumage color	1	2	1	2	1	Plumage color	2	-	4	3	1
							Height	1	-	3	3	2
	Overall ranking[2]	3	4	2	2	1	**Overall ranking[2]**	3	-	4	2	1
II	Number of eggs	2	-	1	1	2	Number of eggs	4	-	1	1	2
	Hatchability	2	-	2	2	1	Aggressiveness	1	-	3	3	2
	Egg size	2	-	3	1	2	Egg size	2	-	3	2	1
	Disease resistance	1	-	2	3	1	Weight	1	-	5	3	2
	Meat taste	1	-	2	3	1	Meat taste	1	-	3	2	1
	Birds' price	1	-	2	2	1	Physical structure	1	-	2	2	2
	Plumage color	1	-	3	2	1						
	Overall ranking[2]	2	-	4	3	1	**Overall ranking[2]**	3	-	4	2	1
III	Number of eggs	3	1	1	1	2	Number of eggs	4	3	1	1	2
	Hatchability	2	1	3	3	1	Aggressiveness	1	3	3	3	2
	Egg size	2	2	3	1	2	Egg size	2	1	3	2	1
	Disease resistance	1	2	2	2	2	Weight	1	4	5	3	2
	Meat taste	1	1	2	3	1	Meat taste	1	1	3	2	1
	Birds' price	1	3	3	3	2	Physical structure	1	2	2	2	2
	Plumage color	1	3	2	1	1						
	Overall ranking[2]	2	1	3	4	1	**Overall ranking[2]**	3	4	4	2	1

[1]; 1= very important, 2= somehow important, 3= not important
[2]; 1= becoming more important, 2= same as before, 3= less important, 4= new activity

Constraints to chicken production mentioned by farmers at Site-II were; less availability of space, prevalence of disease, harsh environment, lack of financial/veterinary/extension services, absence of quality feed, theft and risk of predators. Nearly all breeds were affected by all constraints. Among various constraints, prevalence of diseases and lack of financial assistance were the most important. The veterinary services were available for chicken at veterinary hospitals yet in the absence of medical drugs to treat chicken, farmers were providing health care to their flocks themselves using ethno-veterinary aids. The suggestions from the respondents to cope these problems were the availability of credit for fencing/proper housing and vaccination facilities within their villages.

DISCUSSION

The present appraisals conducted through participatory approach showed great interest of farmers in chicken keeping, representing importance of chicken as source of food, cash and pleasure at both experimental sites. A sociological evaluation is considered necessary in determining strategies for development. Technical and economic appraisals that identify and overcome the constraints are also essential to establish short term and long term development plans. Participatory methodologies are used to get better understanding of rural production systems that makes possible the collection of wide range of information, more important to the farmers and in a gender-sensitive manner (Alders and Spradbrow, 2001). Participatory appraisals help in preference ranking of issues under discussion (Chambers, 1992) and same was the case in present study.

Findings of PRA in present project showed crop farming a major contributor of livelihood of the farmers along with livestock and poultry being the second most important source. Livestock and poultry was also one of the important contributor of cash income at both sites. Chicken keeping involved, more number of poors and moderate farmers than other wealth groups. Farmers were keeping chicken for home consumption and to generate income from extra production of eggs and birds while well off class was involved in Aseel breed as a prestige or hobby. Similar findings have been reported in previous studies made by Farooq *et al.* (2000, 2002 and 2004) and Tufail *et al.* (2012) in various regions of Pakistan while Mengesha *et al.* (2008) found; poor, medium and rich class keeping chicken for sale, religious ceremonies and home consumption, respectively. In the present work, income obtained from extra sale of eggs and birds was kept mainly by females or household head and was spent on food, health, education of children and other social activities. However, male respondents were also investing back this income on livestock and poultry. Present finding was in accordance with Muchadeyi *et al.* (2009) in Zimbabwe where chicken was served as an investment and source of security for households in addition to their use as sources of meat and eggs for consumptions and income. Among the present project sites, land was becoming fragmented with the passage of time and so less availability for crop cultivation due to inheritance

laws and shortage of water. Consequently, trend of livestock raising was becoming more important especially at Site-I while farmers at Site-II were living near city and they preferred to work as laborer or start small businesses instead. As far as poultry was concerned trend was same as before by majority of the male respondents while female respondents stated increasing trend at both sites. Tendency of working in factories located in big cities was also on increase and many young and middle-aged males were considering and migrating to big cities for employment. Despite the fact that contribution of factory workers in the livelihood as a whole was limited but the cash contribution was high.

Men frequently have preference keeping larger animals such as cattle, buffalo as major asset and social capital while women prefer chicken and goats. Even though livestock and chicken management involves whole family yet most of the activities of rearing, feeding and management of animals were performed by females in current study. According to Brorholt (2000) and Joensen (2002) particular interest of women in poultry raising is due to the number of reasons. The first among those is less initial investment and quicker returns. Second are the easy management and less economical loss in case of theft, predation and disease in comparison with larger livestock. Moreover, the women themselves may make decisions about consumption and sales of eggs and birds and money obtained from sale can be kept with them. Present findings are similar to that of Tufail *et al.* (2012) in Swat region of Pakistan where more number of women (69%) kept chicken than men (31%) for home consumption. Group interviews conducted by Muhiye (2007) in Ethiopia indicated management of chickens totally under women and children while construction of shelters was mainly done by men. Similarly, Tadelle and Ogle (2001) also found complete involvement of women in management of chicken whereas decision making regarding control and access to resources varied considerably among gender.

According to FAO (2003) the percentage of farmers keeping different breeds varies from family to family and is limited by the socio-economic constraints of the farmer, family labour, space, feed resources, disease and prevalence of predator in the area. In current study respondents' perception was highest for Fayoumi, Rhode Island Red and Desi breed at Site-I while Desi at Site-II. Similar findings were reported by Farooq *et al.* (2002) and Tufail *et al.* (2012). The proportion of farmers rearing Fayoumi chicken was higher than those rearing Rhode Island Red. According to Javed *et al.* (2003) the breeds other than Desi and Fayoumi are considered more prone to adverse environment conditions and so less acceptable by farmers. Similar to present work Mengesha *et al.* (2008) reported flocks consisted of local chicken (77%), exotic and crossbreds (23%) in Jamma District, South Wollo, Ethiopia. Chicken in the rural areas of Pakistan most frequently known as Desi are non-descript or cross of existing breeds in the area. Some farmers also considered Aseel among Desi and crosses of Fayoumi and Rhode Island Red also remained confused. Desi birds are low producing both in terms of meat and egg still their ability to go broody and taste of meat are preferred over commercial birds. Higher egg production of Fayoumi and Rhode Island Red make them better choice of farmers for replacement. Aseel bird is highly priced and available in almost every village and town. The Aseel hens are not that good layer but well known for their brooding and mothering ability (Yaqoob *et al.*, 1965; Ahmad *et al.*, 1969; Bhatti *et al.*, 1990) however, they were not preferred chicken breed among women.

Replacement stock was mostly purchased and uncontrolled breeding was practiced at study sites, though some pure breed breeders cross their birds within a breed, still their fraction was small. According to Mandal *et al.* (2006) and Perveen *et al.* (2013) hatching and rearing of chicks at village level was naturally done with hens. Farooq *et al.* (2002) and Tufail *et al.* (2012) also observed replacement stocks originating from hatching own chicks and if not then purchased from the local market or neighbors or taken as gift from some relative or friend. Findings of present study were similar to other reports. Farmers however, preferred to purchase adult birds rather than young ones. Traits such as body weight, eggs laid and mothering ability were given importance during selection of their hens for brooding. Moges *et al.* (2010) also indicated that selection of cocks as replacements was based on plumage color, physical stand, comb type and parent's performance while criterion for selecting broody hens was little different. It considered hens' past egg incubation performance, presence of big body size, presence of thick feather and size of eggs laid. Present work agree with Abdelqader *et al.* (2007) who observed that egg production is the most important criterion followed by mothering ability and body weight among village farmers in Jordan.

Indigenous chicken are kept mostly for family use. The spare birds and eggs are sold in the village or nearby market and the earned money are utilized to fulfill the family needs of the household. This is a common practice in the rural areas of Pakistan and same was true for project area under study. In the commercial poultry farming farmers sell the products in the main market while in case of indigenous poultry breeds the main consumers are the owners themselves and village households who informally buy from the producers. Parallel to present work Mandal *et al.* (2006) working in Assam (India) reported that poultry owners consumed eggs for themselves followed by selling at consumers' doorstep and village shopkeepers.

Studies on chicken production system in various countries have concluded that diseases such as Newcastle presence led to high mortality, the major constraint to

chicken production found in present work. Other constraints included poor management practices on feeding, housing and disease control; lack of technical information and capital; and credit service to start and expand chicken production (Fentie *et al.,* 2013; Zewdu *et al.,* 2013). Lack of capital, institutional credit facilities, medicine and veterinary services in Bangladesh (Dutta *et al.,* 2013) and high mortality, disease, lack of suitable breeds, attack of predators, hatching mortality and high cost of inputs in Assam, India (Mandal *et al.,* 2006) have been reported some of the reasons. In the absence of veterinary services and high competition for the available scavenging feed resources chicks die during rearing period. Predation further exaggerates losses because the young stocks are more vulnerable. Lack of proper marketing and non-accessibility to markets resulted in the lesser benefit to the farmers. About 38% village chicken owners getting advisory service, trainings, credits and input facilities through agriculture extension workers in Bure district, Northwest Ethiopia (Moges *et al*., 2010) which seems quite reasonable as compared to the villages in Punjab where these facilities were close to zero.

Conclusion: Keeping in view the prevailing production systems and input resources in the study area it is suggested to improve indigenous breeds with farmers' preferred traits. Birds of improved breed need to be introduced among the villagers instead of any breed. The incomeand livelihood can be made better through credit facility and trainings especially to female farmers who earntheir day to day spending needs from chickens.

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