Enhancing livelihoods through livestock knowledge systems (ELKS) in Jharkhand, Uttarakhand and Nagaland: Knowledge Attitude and Practice (KAP) Baseline Report 2013

ILRI PROJECT REPORT

Nagaland Empowerment of People through Economic Development

Himmotthan Society, Uttarakhand

Agency for Porcine Foundation and Development of Nagaland (APFD)

Prodigals' Home Dimapur, Nagaland

Sir Ratan Tata Trust and Navajbai Ratan Tata Trust

Central Himalayan Rural Action Group

Uttarakhand Livestock Development Board

Enhancing livelihoods through livestock knowledge systems (ELKS) in Jharkhand, Uttarakhand and Nagaland: Knowledge Attitude and Practice (KAP) Baseline Report 2013

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ACRONYMS

APFD	Agency for Porcine Foundation and Development of Nagaland
CAHPs	Community Animal Health Programs
CBPP	Contagious Bovine Pleuropneumonia
CHRAG	Central Himalayan Rural Action Group
CINI	Collectives for Integrated Livelihood Initiatives
ELKS	Enhancing Livelihoods through Livestock Knowledge Systems
FMD	Foot and Mouth Disease
HGVS	Himalayan Gram Vikas Samiti
HS	Himmotthan Society Dehradun
ILRI	International Livestock Research Institute
KAP	Knowledge, Attitudes, Practices and
MVDA	Mount Valley Development Association
NBJK	Nav Bharat Jagriti Kendra
NEED	Network Enhancement and Enterprises and Development Support
NEPED	Nagaland Empowerment of People through Economic Development
NGO	Non-Governmental Organization
OBC	Other Backward Class
PH	Prodigals Home Nimapur
SC	Scheduled Caste
SRTT	Sir Ratan Tata Trust
SST	Sankalp Samiti Tharali
ST	Scheduled Tribe
SUPPORT	Society for Upliftment of People through People Organization and Rural Technology
ULDB	Uttarakhand Livestock Development Board

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EXECUTIVE SUMMARY

Knowledge, Attitude and Practice (KAP) survey was conducted to assess the current level of knowledge, beliefs, and practices in relation to livestock production, management and marketing. The baseline study results are expected to strengthen SRTT and its partners' capacity to apply technical, social and institutional research knowledge. This study was carried out during the initial stages of the Enhancing Livelihoods through livestock Knowledge Systems (ELKS) project in June 2011. The livestock in the study sites included cow, buffalo and goat in Uttarakhand, pig and goat in Jharkhand, and pigs in Nagaland.

Thirteen partners participated in the KAP study. Fifty per cent of the respondents had been trained on livestock production aspects for cattle, buffalo, goat and/or pigs over the past three years. The least capacity building efforts were placed on value chains and none of the partners were trained on goat value chains. Lack of capacity on policy dialogue was also reported. Of all thirteen partners, six had received training on production practices and other related topics but only, three had provided training to other stakeholders on livestock management activities and none on policy dialogue for livestock production.

More partners were able to make a self-assessment about their knowledge of monitoring and evaluation and gender aspects than about livestock production and management aspects. They were also more knowledgeable about large ruminant production and management activities than the same aspects for other smaller animals. In an assessment of service provision, partners reported that access to services and technological packages by smallholder producers was more constraining than factors such as swine fever control and adoption of clean hygienic practices for pigs, and shortage of fodder for large ruminants and goats. They agreed that better services could be provided through improved partner coordination. Positive attitudes were reported about the potential to upgrade backyard production to semi-commercial production through better access to markets.

The use of cross bred animals was limited to only cattle and pigs. Cross breeds were reportedly associated with higher maintenance costs, lower disease resistance, and poor success of artificial insemination (AI) services. Controlled mating was promoted for all species but AI was promoted for cattle and buffalos. The widest options from which mating animals were sourced were for goats and pigs. Bucks were sourced through exchanges with farmers and neighbours and from the owner's herd but boars were hired. Mating options for cattle were limited to the use of local bulls.

Stall and sty feeding practices were promoted by partners for ruminants and pigs respectively. Concentrates were promoted for cattle by Central Himalayan Rural Action Group (CHIRAG), Uttarakhand Livestock Development Board (ULDB) and Mount Valley Development Association (MVDA), for buffalo by Himalayan Gram Vikas Samiti (HGVS), and ULDB and for pigs by Prodigal's home (PH). Constraints to feeding included lack of feeds for cattle, high cost of transportation of feeds and time spent collecting feedstuff for buffalo.
The walled shed with a roof was the most common housing structure promoted for all species by partners but the practice of keeping livestock in the house was promoted by different partners for all species including large ruminants.

No disease prevention measures were promoted against cattle diseases but vaccinations were promoted as prevention methods for goats by Sankalp Samiti Tharali, Himmotthan Society Dehradun (HS) and for buffalos by CHIRAG. Treatment methods included conventional medicine for buffalos and change of management for pigs.

Marketing and value chain activities were limited to the promotion of marketing groups by six partners.

Partners' capacity on policy dialogue, market research for products and enhancement of value chain activities needs to be enhanced, particularly for pigs, goats and buffalos. Capacity building efforts of partners need to be strengthened particularly for animal management aspects, use and promotion of cross breeds, participation in, and strengthening of, value chain activities. Strengthening the value chain activities needs to begin with the value chain analysis (VCA) of the different species in the different states.

1 CHAPTER I: INTRODUCTION

1.1 Livestock production in Jharkhand, Uttarakhand and Nagaland

Livestock have revolutionized the rural economy of India. It plays an integral and significant role in smallholder subsistence in diverse states of India .For example, in Nagaland, livestock constitutes 18% of the value of output from the agricultural sector (Kumar et al. 2007), while in Uttarakhand contribution of livestock to output of agriculture and allied activities is 25–30% (GOI 2012). In Jharkhand, the majority of farming households keep a range of livestock including cattle, buffalos, goats and pigs which form a traditional role in their livelihoods. Pigs in Jharkhand, constituted 6.57% of the total number of pigs in India, and approximately 6.26% are in Nagaland according to the livestock census of 2007.

Table 1: Livestock population in Jharkhand, Uttarakhand and Nagaland

Livestock	**Jharkhand (In thousand)**	**Uttarakhand (In thousand)**	**Nagaland (In thousand)**	**India's total**
Cattle	8781 (4.41)	2235 (1.12)	470 (0.23)	199075
Buffalos	1506 (1.42)	1220 (1.15)	35 (0.03)	105343
Sheep	483 (0.67)	290 (0.40)	4 (0.005)	71558
Goats	6592 (4.6)	1335 (0.94)	178 (0.12)	140537
Pigs	732 (6.57)	20 (0.17)	698 (6.26)	11134

Figures in bracket is the per cent share from total livestock population in the state
Source: Livestock census (2007)

Livestock sector have the capacity to provide opportunities for livelihood to people at the place where and in the situation they are. Growing demand for livestock and its products in the urban and rural areas of India emphasizes the opportunity for increased livestock production through livestock development initiatives. Livestock production has the potential to become an economic enterprise that targets the poor and marginalized if the development focus is on the value chain approach (Sirohi and Chauhan 2011). From the point of view of pro-poor shifts in government policies, new technologies and economic growth an enabling policy environment for livestock production in India also exists. Despite these prospects for increased livestock production, there still exists an unmatched potential for the supply for livestock products.

Notwithstanding the importance of livestock in the eastern, north eastern and northern states, there has been slow development in the livestock sector in states such as Jharkhand, Nagaland and Uttarakhand. The common farm level constraints to livestock production in these three states include feeding, nutritional and animal health constraints (Birthal et al. 2002; Kathiravan et al. 2011). The major farm level hindrances to improved production and productivity include low adoption of improved practices due to farmers' financial resource constraints particularly the Scheduled caste (SC), Scheduled tribe (ST) and other backward castes (OBC) (Birthal et al. 2002; Kathiravan and Selvam 2011). Pig production in Nagaland is mainly hindered by production and management constraints including swine fever, nutritional deficiencies, and unhygienic management practices. In Uttarakhand, constraints to cattle production systems include the lack of feed resources which are (mainly linked to common property resources and) known to cause significant negative impacts on milk yields, livestock health and deterioration of the forest quality. Other constraints in this state include lack of improved breeds, poor livestock health and ineffective marketing facilities. Livestock production constraints in Jharkhand are constrained by lack of good quality breeding stock, inadequate feed and fodder and higher incidence of Peste des petit ruminants (PPR).

1.2 Project description

In response to the aforementioned challenges to animal production and marketing, projects such as ELKS, (Enhancing livelihoods through livestock knowledge systems), a TATA–ILRI partnership program are being implemented. The Navajbai Ratan Tata Trust (NRTT) is an allied Trust of SRTT Sir Ratan Tata Trust (SRTT), which supports poor and marginalized groups, including women, the tribal populations and scheduled tribes and castes. The livestock development component is mainly supported by the Himmotthan Pariyojana, Central India Initiative (CINI) and North East Initiative (NEI), their three regional initiatives. Under the ELKS

project, NRTT is financing livestock development in the underprivileged states of Jharkhand, Mizoram, Nagaland and Uttarakhand, to improve livelihoods particularly of tribal and marginal groups and women, based on the potential of the livestock sector to generate income and employment. The International Livestock Research Institute (ILRI), as a knowledge partner, plays a role in strengthening the capacity of SRTT, its Allied Trusts and their partners in their endeavour to reduce poverty through the application of technical, social and institutional research knowledge to improving livestock-based livelihoods.

This project enhances the response and innovation capacity of key partners and actors in the livestock system in the hilly/tribal areas while filling knowledge gaps and facilitating an enabling policy environment. As a component of the baseline studies that will be conducted at the household and partner levels in Uttarakhand, Jharkhand, and Nagaland this study constitutes the baseline knowledge and promotion of technologies and practices by ELKS partners on livestock production, management and marketing. Household baseline conditions will be conducted to compliment and triangulate baseline results from this study.

The value chain approach is employed by the ELKS project to ensure opportunity identification for increased market performance; value addition, and incentives for key actor linkages in service provision and markets. The project applies the innovation systems perspective to the value chain framework by acknowledging sources of innovation such as multi stakeholder organizations along the value chain whose institutions affect the process by which innovations are developed and delivered. The focus is to understand how knowledge is exchanged; how institutional and technological change occurs by examining the roles and interactions of diverse agents involved in the development and delivery of innovations at all levels using partnerships, networks and stakeholder driven processes. Understanding the knowledge and institutional changes perceived by partners can be gained through the use of a Knowledge Attitude and Practice study (KAP) study of SRTT partners on the production and management practices.

1.3 The Knowledge Attitude and Practice (KAP) Survey

A Knowledge Attitude and Practice (KAP) survey was conducted to collect information on what is known, believed and done (WHO 2008) in relation to livestock production, management and marketing by the Sir Ratan Tata Trust and its development partners. At baseline level, the ultimate goal of the KAP survey is to strengthen the partners' capacity to apply the technical, social and institutional research knowledge for improving livestock-based livelihoods and value chains. However, prior to awareness creation, it is necessary to determine the environment in which awareness creation shall happen (Kaliyaperumal 2004), including the knowledge gaps, beliefs or behavioural patterns that facilitate understanding and action undertaken in livestock management and marketing aspects. WHO (2008) identifies other uses of the KAP survey as needs assessments, barrier and problem identification in program delivery, and solutions for improving quality and accessibility of services. Within the context of this study, knowledge refers to partners understanding of livestock (cattle, buffalo, pigs and goats) production and management within the value chain context, and barriers to service delivery. Attitudinal measures are pre-conceived ideas and perceptions that partners have about livestock production, management, marketing and service delivery in marginal and tribal communities while practice or use of the technology is how partners demonstrate their knowledge and attitude through the use and dissemination of technologies to smallholder producers and marginalized groups.

The KAP survey will establish a baseline for comparison on knowledge, attitude and practices of livestock production and marketing aspects with subsequent post-intervention KAP surveys. Understanding the KAP of partners at various stages of the project cycle enables a more efficient process of awareness creation which in turn allows development of targeted capacity building activities to the needs of partners and consequently the community. Annual repetitions of this study using the same respondents from their respective partner organizations will explore changes in knowledge and attitudes of partners towards livestock production, management and marketing activities and changes in use of practices by these partners. With increased knowledge, partners will contribute to technology adoption at community level, and increased capacity, practices and processes and policy strategies.

1.3.1 Objective of the study

The study was conducted to establish baseline Knowledge, Attitudes, and Practices (KAP) of project partners and stakeholders with regard to cattle, pigs, goat and buffalo production and management (breeds and breeding, health, feeds and feeding, housing), service provision and marketing aspects.

1.4 Report Limitations and Outline

The report limitations include a lack of consistency between the KAP sections in terms of depth of information collected. While details such as service provision, technologies and practices were solicited, aspects such as the exact knowledge about livestock production, management and marketing were not. It was therefore difficult to verify and translate knowledge into practices reportedly used by the partners because specific knowledge on livestock production and management practices were not solicited.

In Chapter I, we provide an overview of the livestock production in the project states, and background information about the KAP study within the context of the ELKS project. In Chapter II, a background preview of the study area, design and information sources are presented. The results and discussion section (Chapter III) is sub divided into four sections: respondent characteristics, services provided, practices promoted and the summary of service provision. The sub section on service provision provides details mainly on quality of service provision and capacity building aspects while practices promoted sub section gives a preview of the breed, feeds, housing practices, health and livestock marketing aspects promoted by partners. The KAP results are integrated into the service provision and practices promoted sub sections. The summary sub section gives a pictorial overview of services provided by partners. In the fourth and fifth chapters, the conclusions and study recommendations are presented.

2 CHAPTER II: STUDY AREA, SOURCES OF INFORMATION AND ANALYSIS

Seventeen participants representing thirteen ELKS partner organizations completed the KAP baseline tool during a workshop held at the Birsa Agricultural University (BAU) in Ranchi, Jharkhand state (Table 2) in May, 2011. The Himmotthan Society (HS), Network for Enhancement and Enterprises and Development Support (NEEDS), and Society for Upliftment of People through People Organization and Rural Technology support (SUPPORT) sent two representatives. The four project target states consist of Mizoram and Nagaland in N.E. Region, Jharkhand and Uttarakhand (Appendix 2) however no partners from Mizoram attended the workshop. Across livestock species, seven partners from Uttarakhand and Jharkhand were concerned with service provision for cattle, goats and buffalos while six partners from Jharkhand and Nagaland were principally involved service provision for pig production. Table 2 provides further information about partners, and districts where they are expected to provide services under the ELKS project. Anticipated services include holistic development models for small ruminant livestock, nutritional packages for pigs and policy facilitation for all species and regions.

Table 2: Background of Sir Ratan TATA Trust (SRTT) (ELKS) partner organizations

State: Uttarakhand	**Districts:** Pithoragarh, Tehri Garhwal, Chamoli	**Livestock Species Focus for ELKS**
Organization type	**Partner**	
Government	1. Uttarakhand Livestock Development Board (ULDB)	Cattle
NGO	1. Himmotthan Society (HS)	Goat/cattle/buffalo
	2. Mount Valley Development Association (MVDA)	Cattle/buffalo/goats
	3. Himalayan Gram Vikas Samiti (HGVS)	Cattle/buffalo
	4. Central Himalayan Rural Action Group (CHIRAG)	Cattle/buffalo/goats
	5. Sankalp Samiti Tharali (Sankalp)	Goats
State: Jharkhand	**Districts:** Gumla, Deoghar, Khuntim, Ramgarh	
Organization type	**Partner**	
NGO	1. Society for Upliftment of People through People Organization and Rural Technology (SUPPORT)	Pigs
	2. Network for Enhancement and Enterprises and Development Support (NEEDS)	Goats
	3. Nav Bharat Jagriti Kendra (NBJK)	Pigs
	4. Collectives for Integrated Livelihood Initiatives (SRTT CINI)	Pigs
State: Nagaland	**Districts:** Mokokchung, Wokha, Kohima, Dimapur	
Organization type	**Partner**	
NGO	1. Prodigals' Home (PH)	Pigs
	2. Sir Ratan Tata Trust—North East Initiative (SRTT—NEI)	Pigs
	3. Agency for Porcine Foundation and Development of Nagaland (APFD)	Pigs

Source: Modified from ELKS—Baseline Survey Sampling Protocol Jane Poole et al. 2011

Services will be delivered across six districts in North East region which includes four districts (Mokokchung, Wokha, Kohima, and Dimapur) of Nagaland where three partners will implement activities and two in Mizoram (Aizwal, Kolasib). As indicated in Table 2, in Jharkhand, four partners will implement activities in four districts(Gumla, Deoghar, Khuntim and Ramgarh) while three districts namely Pithoragarh, Tehri and Chamoli in Uttarakhand will be involved with the most partners (6) from both the government and NGO sector. Some NGOs in this study operate as network type organizations (which operate through other implementing partners) while others implement activities directly at grass root level.

The KAP survey baseline questionnaire contained questions about the background of the partners and their KAP section. The background section contained questions about the respondent background and their presence in TATA–ILRI project villages. The knowledge section was sub divided into assessment of

knowledge, training, materials used to train stakeholders, and whether the partners trained other stakeholders. The attitude section contained questions in four domains: the services partners provided, production aspects, markets and by laws and policies. The use of practices contained information about the partners' promotion of production, management and market/market chain practices.

Descriptive statistics were generated from data using Statistical Program for Social Sciences (SPSS version 18.0) and included percentages, frequencies and cross tabulations for the three project areas and species (cattle, goats, pig and buffalo).

3 CHAPTER III: RESULTS AND DISCUSSION

3.1 Respondent Characteristics

Thirteen organizations participated in this study. Out of these (12) were non-governmental organizations (NGO) while one, the Uttarakhand Livestock Development Board (ULDB), a government organization. In the ELKS project, ULDB in association with other partners is expected to embark on a cattle breed improvement program for breed upgrading through village demonstrations in remote hilly areas of Uttarakhand. Table 3 provides more details about the respondent characteristics. The majority of partners (12), operated at state level while ULDB operated at national level. Almost half of the participating organizations were from Uttarakhand, four partner organizations were from Jharkhand, while the least number of participant organizations (3) were from Nagaland. In this study there were no participants from Mizoram of the N.E. region.

Table 3: Characteristics of the respondents

	Gender (N = 13)		**Type of Organization** (N = 13)		**Level of Operation** (N = 13)	
State	Male	Female	Government	NGO	State	National
Jharkhand	3 (23)	1 (8)	0	4 (31)	4 (31)	None
Uttarakhand	4 (31)	2 (15)	1 (7)	5 (39)	5 (39)	1 (8)
Nagaland	2 (15)	1 (8)	0	3 (23)	3 (23)	0

Source: KAP survey data (% in brackets)

Half of the partners who participated in this study were from Jharkhand and Nagaland. These partners are expected to provide services for pigs such as improved health service provision through trained village level para-vets, promote a pig nutrition package based on local resources, and improved care and management for breeding sows and piglets. Swine fever control is a major focus of service provision. Partners from Jharkhand will provide services for goats and pigs and in Uttarakhand the six participating organizations will provide services for cattle, buffalos and goats.

3.2 Services Provided by ELKS Partners

3.2.1 Coordination of service provision

Poor households require an array of services to enhance their capacities to exploit the full potential of livestock production. However, hindrances to service provision include ways and means to determine livestock constraints, poor service delivery and cost effective means of service delivery (Ahuja and Redmond 2001). Our initial exploration of the service delivery methods showed that partners had neither a positive nor negative attitude about the method in which they provide services (Appendix 9). Four partners disagreed and two strongly disagreed with the statement that partners work independently within districts therefore it would be challenging to organize themselves into a harmonized and more coordinated effort to provide services. However, an equal number (6) agreed that the partners did in fact operate independently to provide services. In a similar attitude statement phrased differently, eight respondents reported that access to services and technological packages by smallholder producers was more constraining than factors such as swine fever control and adoption of clean hygienic practices for pigs, and shortage of fodder for large ruminants and goats. They agreed that access to services provided by partners could be improved through better coordination of service provision in the concerned districts. This implies that better services could be provided through improved partner coordination in addition to the provision of technological packages.

3.2.2 Promotion of combined technological packages

Close to half (6, 86%) of the partners, promoted technologies as a combined package (Table 4). In Uttarakhand the technologies promoted as combined package included: urea treatment of straw, planting Napier, broom grass, tall fescue in the field bunds, promotion of hand driven chaff cutters, construction of mangers under better feeding practices. Only CHIRAG had initiated an intervention of making feed using locally available resources in their working area but not by other partners (MVDA, HGVS, and Sankalp Samiti). These technological packages were promoted by SRTT in the districts of Tehri, Chamoli, Nanital and Pithoragarh. The other half did not respond to this question, except HGVS who reported that they did not

promote feed mill technologies. Those that did provide combined technological packages were CHIRAG, NBJK, NEEDS, Prodigals Home (PH) Nimapur, SRTT and SUPPORT. These packages were being promoted in eight districts by SRTT CINI however, other partners promoted packages in one district each. The associated difficulty with this method of service provision (reported by NEEDS) was lack of interest by the government to facilitate the organizations that provided services this way.

Table 4: Promotion of combined technological packages

	Yes	No
Technologies promoted as a combined Package (n = 7)		
Promoted technology as a combined service	6(86)	1(14)
Organization	CHIRAG, NBJK, NEEDS, PH, SRTT and SUPPORT	HGVS
Number of Districts	SRTT promote in 8 districts	
	CHRAG, NBJK, NEEDS, PH, and SUPPORT promote in one district each	
Reasons for difficulty to promote technologies as a combined package	Lack of interest from the government	

Source: KAP Survey data

3.2.2.1 Types of services provided

Overall, more services were provided for small animals compared to large ruminants. These services were provided for goats were in Jharakhand and Uttarakhand and in pig production (Table 5) by partners in Jharkhand, and Nagaland. This is as per the livestock owned and in priority by communities in specific states.

Table 5: Livestock production and management activities promoted

	Jharkhand and Uttarakhand	Uttarakhand			Nagaland and Jharkhand
Type of service	**Goat**	**Buffalo**	**Cattle**	**Poultry**	**Pigs**
Training (n = 28)	12 (43)	1 (4)	2 (6)	1 (4)	12 (43)
Input supplies(n = 25)	11 (44)	0 (0)	1 (4)	1 (4)	12 (48)
Supply of animal feeds(n = 9)	2 (22.2)	0 (0)	1 (11.1)	1 (11.1)	5 (55.6)
Livestock management (n = 39)	13 (33.3)	10 (25.6)	3 (7.7)	1 (2.6)	12 (30.8)
Marketing (n = 25)	11 (44)	1 (40	1 (4)	1 (4)	11 (44)

Source: KAP Survey data[1] (% in brackets)

More partners were involved in service provision for livestock management activities (Table 5). Eleven partners were involved in the provision of livestock management services such as breeding, feeding, and health and housing practices mainly reported for pigs, goats and buffalo. Nav Bharat Jagriti Kendra (NBJK) and Society for Upliftment of People through People Organization and Rural Technology (SUPPORT) reportedly provided services for all activities pertaining to goats in Jharkhand while In case of Uttarakhand such an organization was Mount Valley Development Association (MVDA). Table 5 shows the different types of services provided by each partner. This ranged from training, input supplies, supply of animal feed, livestock management, and marketing.

3.2.3 Capacity building activities

Capacity strengthening is a major component of the ELKS project. Capacities of partners will be strengthened to improve their performance which is, in turn expected to improve boundary partner performance (Figure 1). Knowledge about the capacity building activities that partners were previously involved in and how this capacity is translated to other stakeholders including farmers is critical. It is an indication of the areas where

1. This question was a multiple response question where each service could be mentioned more than once for each species.

capacities should be strengthened by the project. In the next section we present the status of partners' knowledge gained from previous training on breeding, nutritional improvement, value chain and policy aspects in livestock projects during the last three years which we compare to service provision provided by the partners.

In the last three years less than half the ELKS partner organizations were trained on production or marketing aspects for any species. Figure 1 provides an insight into the number of partners who were trained, and aspects that they were trained on across the different states. Topics that received the most training for all species were breeding, housing, health management practices with one or two partners receiving training for all livestock species, followed by nutritional management aspects (5). The aspect that was least trained on was value chain management. Two partners from Jharkhand and Uttarakhand were trained on cattle value chain management, and training on this aspect was even lower for buffalo (1) and pigs (1). From Uttarakhand no partner was trained on pig value chain as piggery is not a priority species in this region. No partner had been trained in goat value chain management in the last three years. Interestingly, no training on goat nutrition improvement program had ever been provided by any of the partners. In Uttarakhand, this could be because partner NGOS have not secured funds for their goat proposals by government and funding agencies.

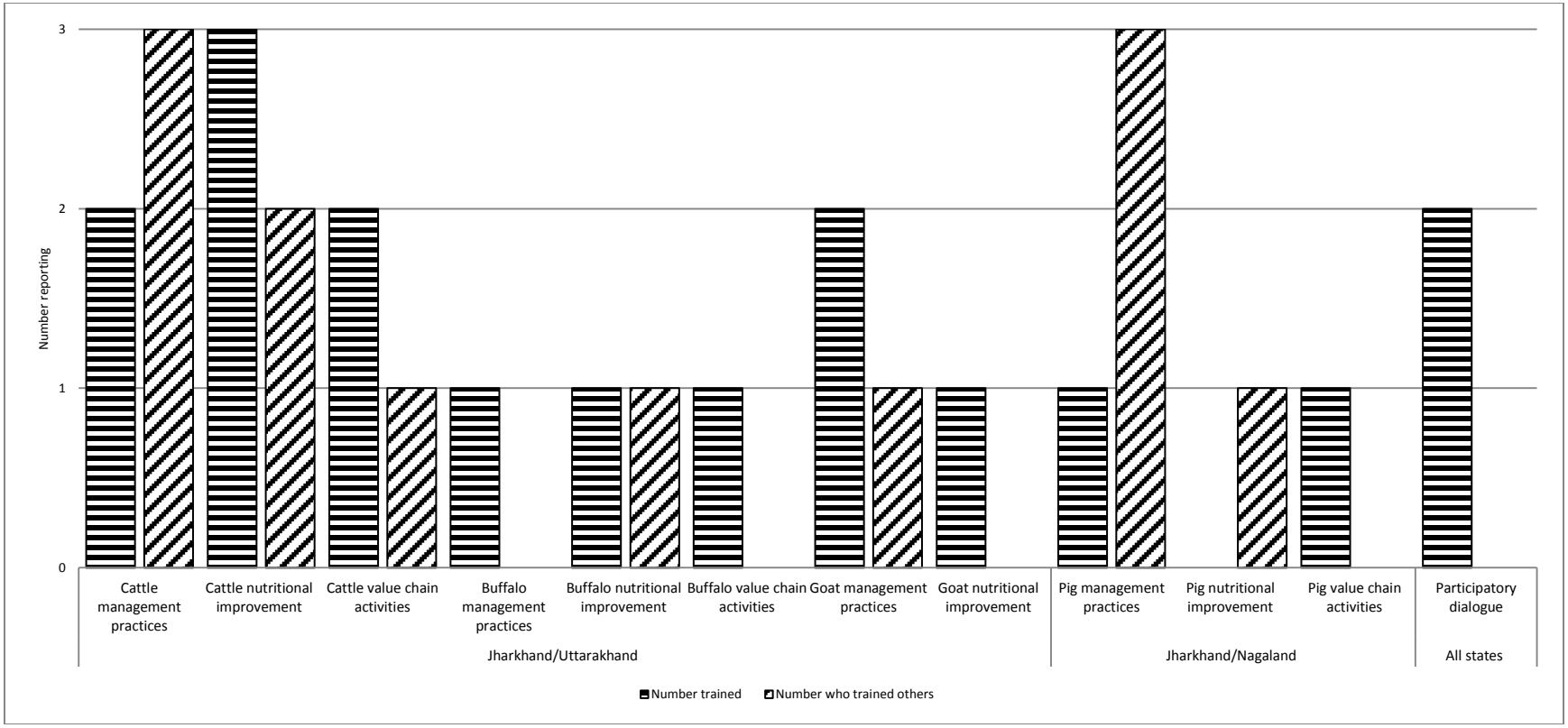

Figure 1: Training received and/or provided by ELKS partners on cattle/buffalo pigs and goat aspects
Source: KAP Survey data
Note: This was a multiple response question where (N = 13)

Only 2 partners from Uttarakhand state reportedly participated in policy dialogue activities. The response to whether partners had trained other partners and stakeholders in livestock management practices was low. Only three partners had trained others in livestock production and management practices, in the last three years despite nine partners reportedly providing capacity building amongst the bouquet of services they provide (Table 5). This disparity probably arises because participants who attended the meeting were higher level officials (management) and not technical persons involved in capacity building activities.

From Figure 1, more capacity was received by partners on cattle and pig production and management than they were reportedly providing services for. For example, limited services were provided for cattle in Uttarakhand (Table 5), however, up to 50% (n = 2–3) partners had been trained in cattle management practices, nutritional improvement and value chain management practices (Figure 1) in Uttarakhand and Jharkhand.

3.2.4 Knowledge about project management related activities

We asked partners to make a self-assessment of their knowledge about project management aspects. Figure 2 shows that more than 45% (7) of the respondents rated their current level of knowledge on M&E, integration of gender into project design and implementation (5), as good. This result could be attributed to the fact that project partners who made these self-assessments were management personnel.

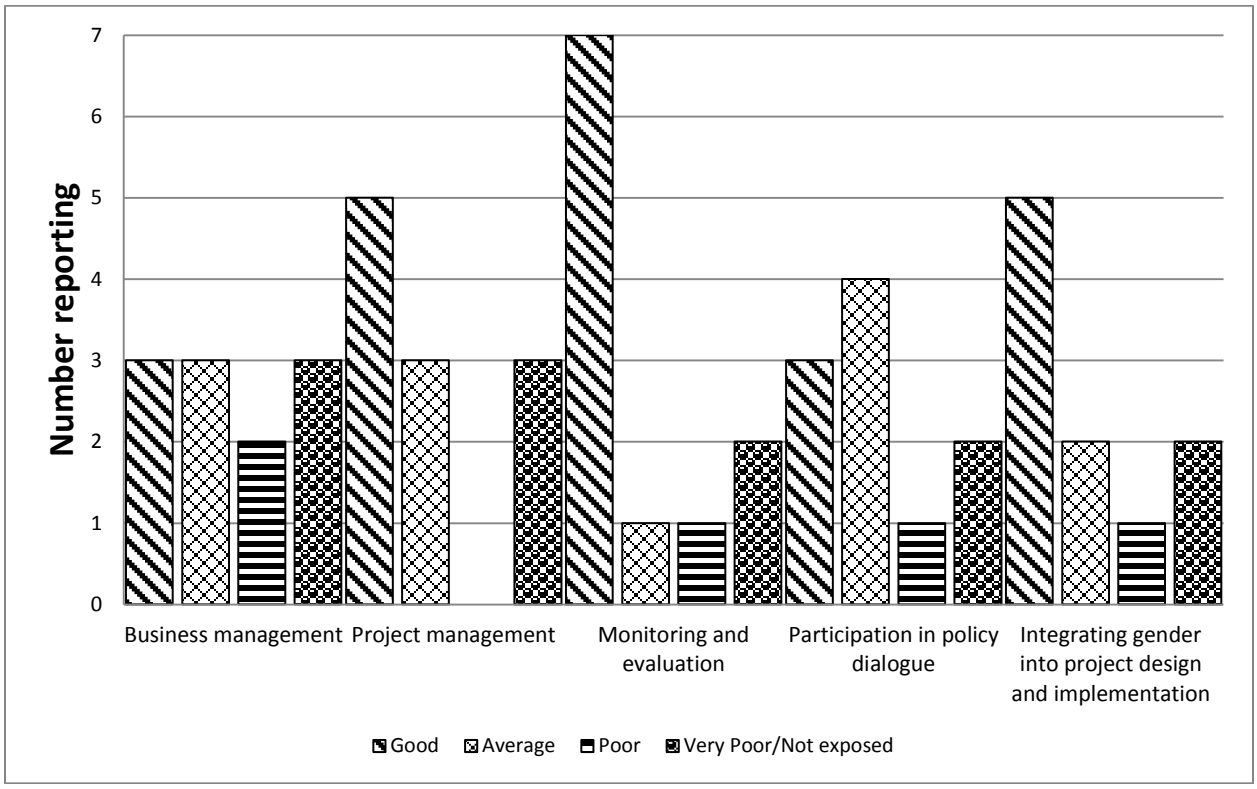

Figure 2: ELKS Partners self-Assessment of Knowledge on Project Aspects
Notes: This was a multiple response Question where (N = 13)

3.3 Livestock Production, Management and Marketing Aspects Promoted by ELKS Partners

Livestock production and management practices promoted by partners have an important bearing on production and performance of livestock. Poor knowledge of agricultural technologies and lack of up to date information about modern agricultural technologies has been reported to lead to food insecurity at the household level (Barkat et al. 2006). The baseline status of partners' knowledge and practices in livestock production, productivity and marketing, is a vital component of their participation in project implementation,

and informs the areas to focus on during capacity enhancement. This baseline survey also provides a basis for comparison with subsequent KAP surveys that will be conducted throughout the project lifetime. Attitude is manifested through practice by changing the behaviour of a person or persons in an organization (Barkat et al. 2006). Positive attitudes that partners have towards services they provide can be reinforced through the use of improved technologies and engagement in value chain activities. Partners were asked to agree or disagree on a five point scale (strongly agree to strongly disagree) with attitude statements in four domains (production, service provision, marketing and policy) domains.

In the next section, we present information about the partners' Knowledge and attitudes in relation to the use of breeding, feeding, housing, health and marketing aspects. Details about the partners' attitudes are also shown in Appendix 9.

The self-assessment of knowledge about livestock management practices showed that an average of six partners were able to make a judgment about their knowledge levels on livestock production, management and marketing in Jharkhand and Nagaland and Uttarakhand and Jharkhand states. Across states, 6 partners from Jharkhand and Nagaland and 11 from Uttarakhand and Jharkhand (Appendix 8) were able to provide responses.

More partners rated themselves as knowledgeable in cattle management and nutrition (Figure 3). Four partners reported that they had a good knowledge of cattle management and nutrition improvement in Uttarakhand and Jharkhand. Two and one partner(s) reported a very poor knowledge of, or were not exposed to, cattle production and management and nutritional aspects respectively in the same states of Uttarakhand and Jharkhand. The result was different for buffalos. An equal number (3) reported that they had a good knowledge about buffalo management practices as those who reported poor knowledge or non-exposure to buffalo management practices in Jharkhand and Nagaland.

Three partners made an average assessment about their knowledge of pig management and nutritional aspects while two partners reported a very poor knowledge of, or were not exposed to, these aspects in Jharkhand and Nagaland. Despite that only one partner reportedly received training on pig production and management, more self-assessments were rated as average than any other category in the same states. This knowledge could have been gained knowledge from informal training. Knowledge assessments about goat production and management were almost similar to the results for pigs (mostly assessed as average for production, management and nutritional aspects), however, two partners (compared to one for pigs) rated their knowledge about goat management and nutrition practices as good.

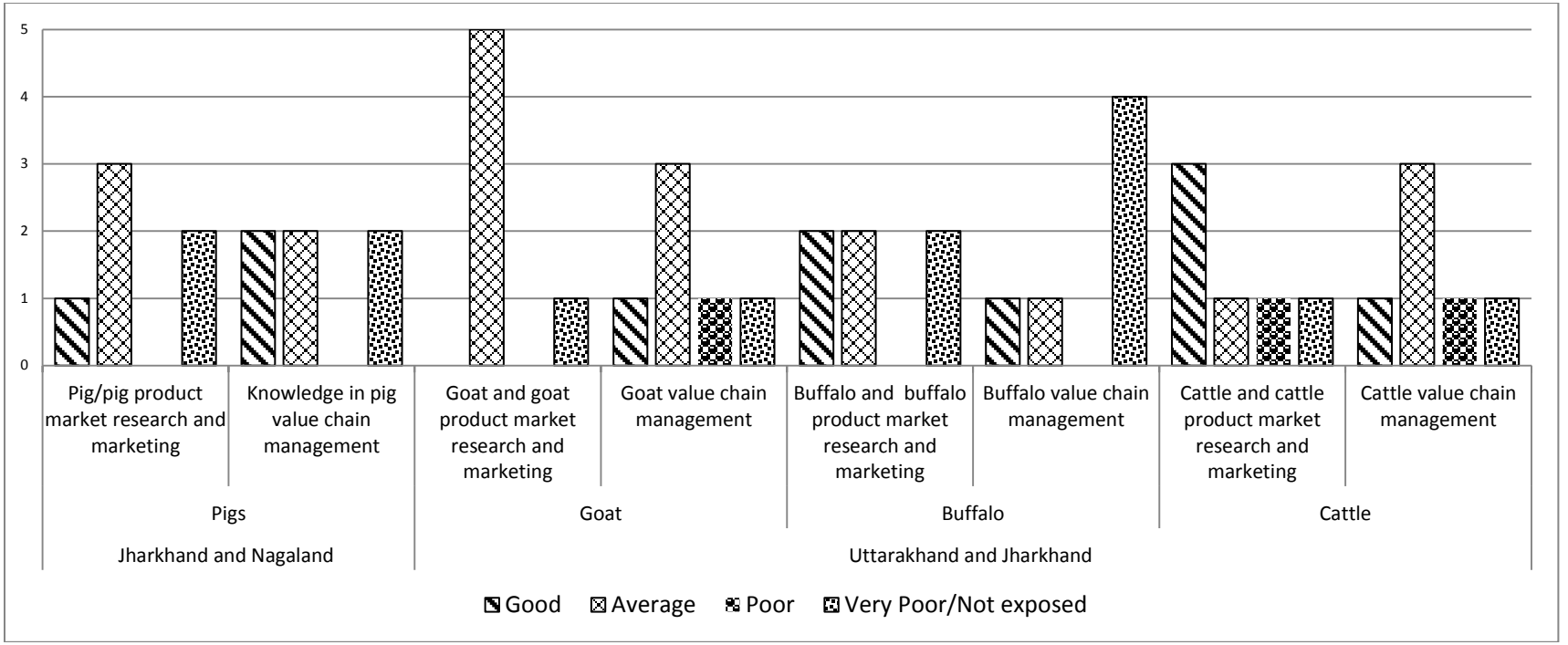

Figure 3: Knowledge about livestock production and management practices
Notes n = 12 (Jharkhand and Nagaland n = 6 and Uttarakhand and Jharkhand n = 6)

3.3.1 Breed and breeding practices

A quarter of the partners promoted the use of cross breeds for pigs and cattle but none reported this practice for goats and buffalos. Low use of cross breeds has been reported by Birthal (2002), Sharma et al. (2007) and Deka and Wright (2011), in India, Uttarakhand and Jharkhand, respectively. Birthal (2002) reported slow adoption rates of 7.5% and 15% for cattle, and pigs respectively. According to partners, cross breeds were seldom promoted due to higher associated maintenance costs than indigenous breeds, and lower disease resistance. Poor adoption of cross breeds due to lower resistance of cross bred cattle has also been reported by Birthal (2002). Table 6 provides information about different types of breeds that partners promoted. The Jersey cross breed (Jersey × HF cross) was promoted for cattle by HGVS, ULDB and CHIRAG, while SUPPORT promoted the Tamworth × Desi breed. For pigs SRTT–CINI, APFD promoted the large black and Hampshire breeds respectively. The widest variety of indigenous breeds that were promoted by NEEDS was for goats (Appendix 5).

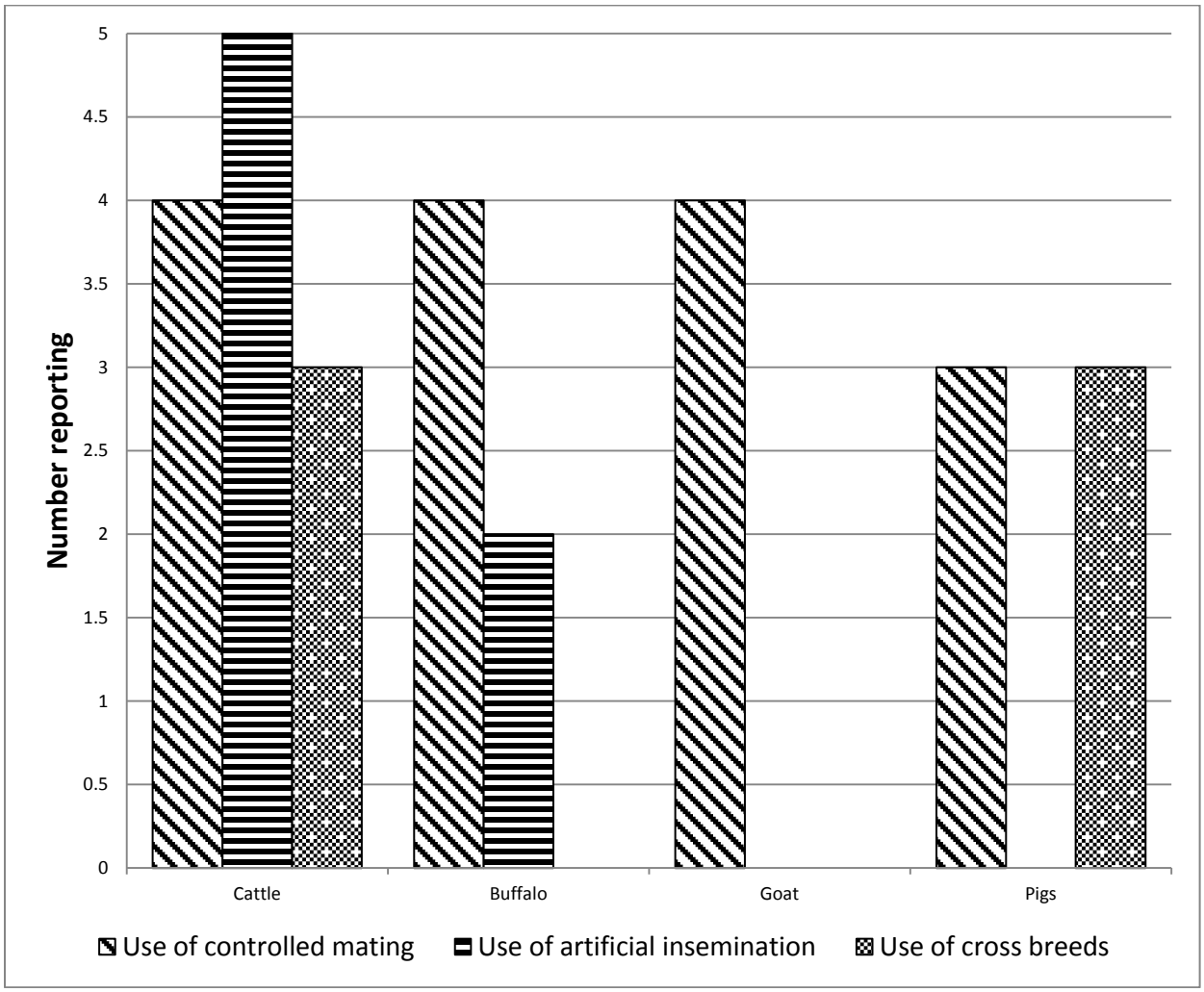

Figure 4: Breeding practices Promoted
Note: This was a multiple response question where (N = 28)

Partners reported contradictory attitudes about livestock breeding practices. They concurred with livestock owners' perceptions that improved breeding practices were expensive, and therefore hindered improvements in livestock production and productivity, however partner attitudes towards breeding

practices were generally positive (Appendix 9). More partners (9) agreed that controlled mating (described as the selection of specific boar or buck to mate with a specific sow or doe in this study) was aimed specifically at reducing animal mortality. Only one respondent (NBJK) disagreed. Controlled mating as a breeding strategy was mainly promoted by partners across all species while artificial insemination (AI) was promoted for large ruminants only. In India, about 10% of the breedable cow and buffalo population have used AI as a mating strategy (de Haan, not dated). Artificial insemination was promoted (Figure 4) mainly by HGVS, ULDB, CHIRAG for cattle and buffalos (ULDB, CHIRAG, MVDA) (Appendix 5). Partners reportedly attributed low use of cross breeds to poor success rate of AI for cattle. The public services in India report non-return rates of 20–40% at first insemination, against about 60–70% for natural service (World Bank 1999). Other shortcomings of AI have been identified as an expensive and difficult strategy to sustain.

Table 6: Breeds promoted

Breeds promoted	Jharkhand and Uttarakhand	Uttarakhand		Nagaland and Jharkhand
Goats Breeds	Goats (n = 16)	Cattle (n = 13)	Buffalo (n = 11)	Pigs (n = 7)
Local (non-descript, indigenous to India)	4(25)	2 (15)	4 (36)	2 (29)
Black Bengal (indigenous)	2 (12.5)			
Beetal (indigenous)	2 (12.5)			
Jamnapari (indigenous)	1 (6.25)			
Shirohi (indigenous)	4(25)			
Barbari (indigenous)	3 (18.75)			
Cattle Breeds				
Red Sinhi (indigenous)		5 (38)		
Sahiwal (indigenous)		3 (23)		
Jersey (exotic)		3 (23)		
Buffalo Breeds				
Murrah (indigenous)			7 (64)	
Pig Breeds				
Gungroo (indigenous-long snout)				2 (29)
Large Black (exotic)				1 (14)
Hampshire (exotic)				2 (29)
Sources of bulls, Pig boars, goat bucks	Goats (n = 13)	Cattle (n = 6)	Buffalo (n = 10)	Pig, (n = 10)
Local (non–descript, indigenous to India)		5 (83)		
Other (cross of ------x-----)		1 (17)	2 (20)	
From farmers own herd	5 (38)		4 (40)	2 (20)
Loan/exchange breeding male with neighbours	5 (38)		3 (30)	2 (20)
Use male from the research station	1 (8)		1 (10)	2 (20)
Purchase from market	1 (8)			1 (10)
Hire the breeding male	1 (8)			3 (30)

Source: KAP Survey data (% in brackets)

Partners reported a wider range of sources of goats and pigs for mating purposes than other livestock species. As smaller animals, they are an easier and cheaper source of mating animals to access at the village level than large ruminants. Different sources of mating males are shown in Table 6. Goat bucks were mainly sourced (n = 5) from farmers' own herd and a loan or exchange with neighbours. Mating options were more limited for cattle with five partners reportedly using local bulls for mating.

3.3.2 Feeds, feeding practices and feeding constraints

Ten partners agreed that improving pig/goat production and productivity is difficult because of livestock owners' perceptions that improved feeding practices are expensive and time consuming. CHIRAG and SR TT disagreed with this attitude statement. Commensurate with attitudes on feeding, partners promoted a combination of open grazing systems (browsing and grazing) and stall or sty feeding depending on the species. Similar findings are reported by FAO (2011) however, Birthal (2002) found that large animals are partially stall-fed and partly grazed on community land while small ruminants are maintained solely on grazing and supplementary feeding in India. Stall feeding was mainly promoted by partners (HGVS, ULDB,

MVDA, SST and HS) for cattle and buffalo while sty feeding and browsing practices were promoted (by SUPPORT, NBJK, PH, SRTT, and APFD) for pigs and goats respectively (Appendix 6).

Birthal (2002) reports that green fodder contributes 26% of the total livestock feed consumption while concentrates contribute 3% in India. We found that concentrates and silage were promoted as cattle and buffalo feed while green or dry fodder and vegetation were promoted as goat and pig feed. Feed types that were reportedly promoted are shown in Table 7. Cake and bran concentrates were promoted by MVDA, ULDB, and CHIRAG, for cattle and for buffalos by HGVS, ULDB, MVDA and Sankalp while Prodigals home promoted it for pigs (Appendix 6). Silage was promoted by SUPPORT, NBJK, and PH for pigs. Browsing was a common feeding practice promoted for goats (n = 6) but fewer partners reported stall feeding for goats. In India, goats have been blamed for denuding vegetative cover and causing desertification, however Kumar and Pant (2002:107) report a negative correlation between states with a high goat density and desertification.

Table 7: Feeds and feeding practices promoted

Number of partners using				
	Goats (n = 17)	Cattle (n = 12)	Buffalo (n = 10)	Pig (n = 5)
Current feeding practices				
Grazing		4 (33)	4 (40)	
Stall feeding	3 (18)	5 (42)	5 (50)	
Browsing	6 (35)			
Both	8 (47)	3 (25)	1 (10)	
Stay feeding				5 (100)
Feeds currently promoted				
	Goats (n = 10)	Cattle (n = 18)	Buffalo (n = 15)	Pig (n = 13)
Dry fodder/vegetation	3 (30)	5 (28)	3 (19)	3 (23)
Green fodder/vegetation	3 (30)	4 (22)	4 (27)	4 (31)
Concentrates (incl. cakes and Bran)	2 (20)	5 (28)	4 (27)	2 (15)
Silage	2 (20)	4 (22)	4 (27)	4 (31)

Source: KAP Survey data (% in brackets)

Feeding constraints identified for all species were financial costs associated with feed purchases and transportation and time constraints (for labour required for feeding). Partners identified transportation costs of feed for buffalo (n = 5), and lack of feeds for cattle (n = 5) as feeding constraints (Table 8). Unavailability of feeds is also reported as a major constraint to animal health and improved management practices (Birthal et al. 2002; Meganatha et al. 2010). Time required to collect feed stuff, high price of feed and cost of transportation of feeds were identified as constraints by an average of four partners, for goats.

Table 8: Associated feeding constraints[1]

States	**Uttarakhand**		**Jharkhand and Uttarakhand**	**Nagaland and Jharkhand**
	Cattle (n = 19)	Buffalo (n = 21)	Goats (n = 19)	Pig (n = 13)
Lack of feeds	5 (26)	3 (14)	2 (11)	3 (23)
Lack of fuel wood to cook feeds	0 (0)	2 (10)	2 (11)	1 (8)
No feeding area	2 (11)	3 (14)	3 (15)	2 (15)
High time requirements to collect feedstuff	4 (21)	4 (19)	4 (21)	3 (23)
Higher price of feed	4 (21)	4 (19)	4 (21)	3 (23)
Cost of feed transportation	4 (21)	5(24)	4 (21)	1 (8)

1. The question on breeding strategies was a multiple response question with each partner providing a response for each livestock type.

Source: KAP Survey data (% in brackets)

3.3.3 Housing practices

Just as was noted with the number of feeding practices promoted, housing options were more versatile for goats than other species. Figure 5 gives details about housing practices that are promoted by partners. The walled shed with a roof was promoted for all species by HGVS, APFD, HS, MVDA, SRTT CINI and PH (Appendix 7). Keeping livestock in the house was reported by MVDA for goats, ULDB for cattle and CHIRAG and ULDB for buffalo but only by APFD for pigs. Because small livestock holders do not have proper housing facilities for animals they are either kept out—or indoors with humans but thatched sheds are often maintained for large animals (Birthal 2002). The walled shed with tin roof is mainly promoted for pigs by SRTT—CINI and PH.

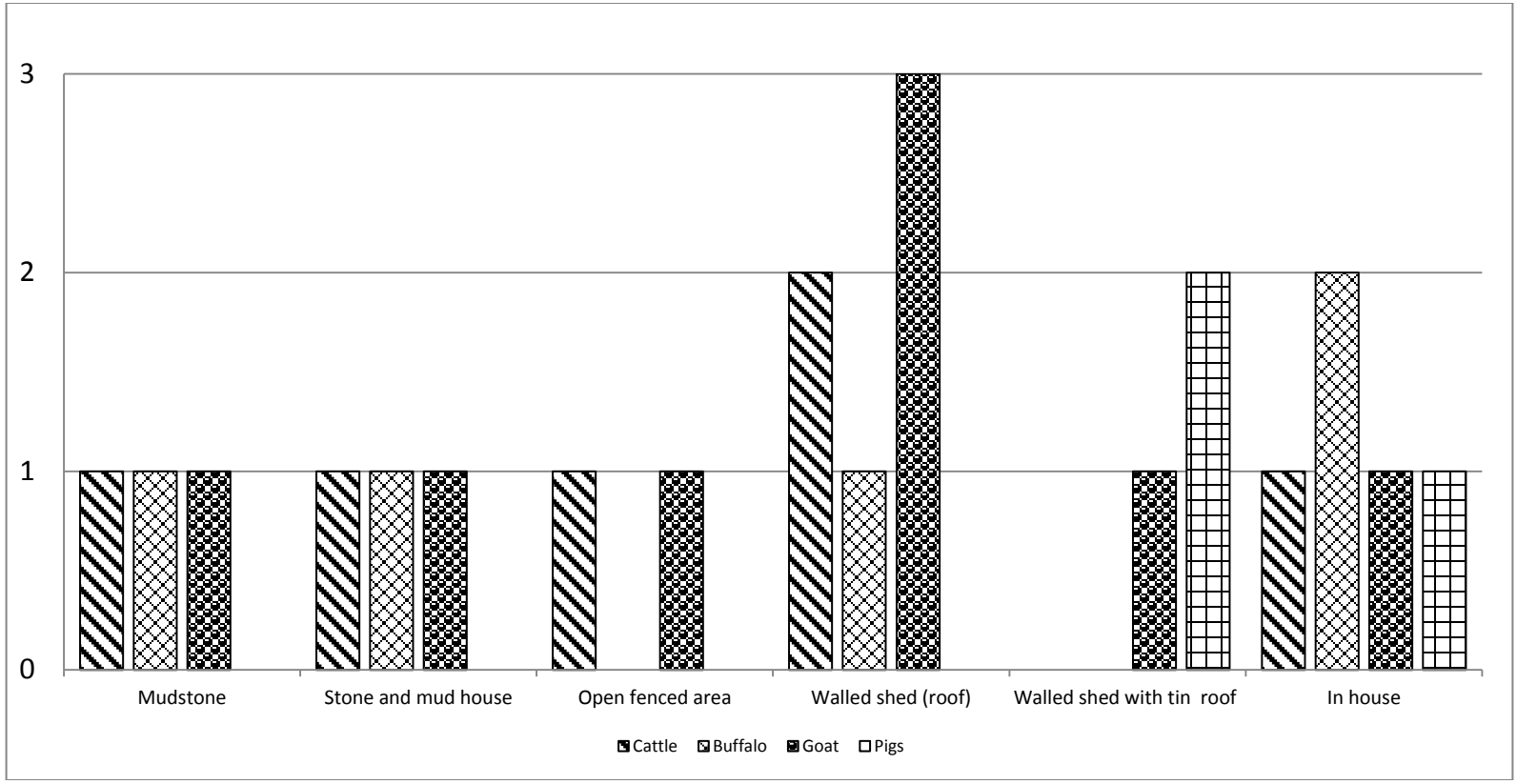

Figure 5: Housing types promoted
Note: This is a multiple response question where (N = 23)
Source: KAP Survey data

3.3.4 Health Management

3.3.4.1 Diseases and animal health practices

Six partners (Appendix 10) reported the presence of community based animal health programs (CAHP) in the communities they operated in. ULDB reported this for 13 districts while CHIRAG, (Uttarakhand), NEEDS, SUPPORT (Jharkhand) and PH (Nagaland) reported only one district which they operated in had access to CAHPs in 2011. SRTT—CINI and APFD (Nagaland) reported the absence of these programs in the areas that they operated in. Reasons given for the absence of CAHP's was the inability of Governmental or non-Governmental organizations to promote the concept.

Black quarter and *heart water* were commonly occurring diseases in large ruminants while in goats and pigs, *dermatitis* and *swine fever* respectively, were reported. Table 9 shows that the common disease for buffalo was black quarter (6), for cattle, *heart water* (2) and for goats', *dermatitis (*3). Birthal 2002, and Ahuja 2008 report continued persistence of *Foot and Mouth Disease* (FMD), *hemorrhagic septicemia*, and *black quarter* in India. Tick-borne diseases and parasitic worm infestations were reportedly common in buffalo while FMD and *Contagious Bovine Pleuropneumonia* were reported for cattle.

Table 9: Common livestock diseases

State	Diseases	Livestock				Total
		Cattle (N = 7)	Buffalo (N = 17)	Goats (N = 10)	Pig (N = 8)	(N = 42)
Uttarakhand	*Heart water*	2 (29)	2 (12)			4 (10)
	Black quarter	1 (14)	6 (35)			7 (17)
	Anthrax	1 (14)	2 (12)			3 (7)
	Contagious Bovine Pleuropneumonia (CBPP)	1 (14)	1 (6)			2 (5)
	Foot and Mouth disease (FMD)	1 (14)		1 (10)		2 (5)
	Mastitis	1 (14)	2 (12)			3 (7)
	Tick Borne diseases		2 (12)			2 (5)
	Parasitic Worm infestation		2 (12)			2 (5)
	Dermatitis			3 (30)		3 (7)
	Enterotoxaemia			1 (10)		1 (2)
Jharkhand	Dysentery			1 (10)		1 (2)
	Dermatitis			1 (10)		1 (2)
	Enterotoxaemia			1 (10)		1 (2)
	Foot and Mouth disease (FMD)			1 (10)	1 (13)	2 (5)
	Contagious Bovine Pleuropneumonia (CBPP)			1 (10)		1 (2)
	Swine fever				1 (13)	1 (2)
	Worms				1 (13)	1 (2)
	External Parasites				1 (13)	1 (2)
Nagaland	*Foot and Mouth disease (FMD)*				1 (13)	1 (2)
	Swine fever				2 (25)	2 (5)
	Worms				1 (13)	1 (2)

Source: KAP Survey Data (% in brackets)

The common disease reported by partners in Jharkhand for goats and pigs was FMD. Other reported parasitic infestations and diseases for pigs were worms, external parasites, swine fever and dysentery; dermatitis and enterotoxaemia was reported for goats.

3.3.4.2 Disease prevention and management measures

To enhance technological change in India's livestock sub sector, emphasis on health management should shift from curative to preventive disease management (Birthal 2002). He further qualifies that the main limitations to effective livestock health management are inadequate focus on preventive measures, lack of medicines and equipment in the veterinary clinics, and ignorance among the farmers about diseases and preventive measures. Consistent with the recommended focus on preventative disease management, the majority of partners reported the promotion of vaccination as the main disease prevention strategy. No prevention and treatment measures against disease were reported for cattle (Figure 6). This is probably due to the use of homemade remedies used to treat sick animals as a result of poor access to health services. Vaccinations were mainly used for buffalos and goats while for pigs, deworming and vaccinations were used. CHIRAG, Sankalp and HS promoted vaccinations for disease prevention for buffalos while Sankalp and HS promoted the use of vaccinations for disease prevention for goats (Appendix 11). Conventional medicine was used as a treatment method by HGVS for buffalo and MVDA for buffalo and goats while change management was a strategy used by APFD for pigs. Partners such as NEEDS, HGVS provided a wider option of prevention and treatment options.

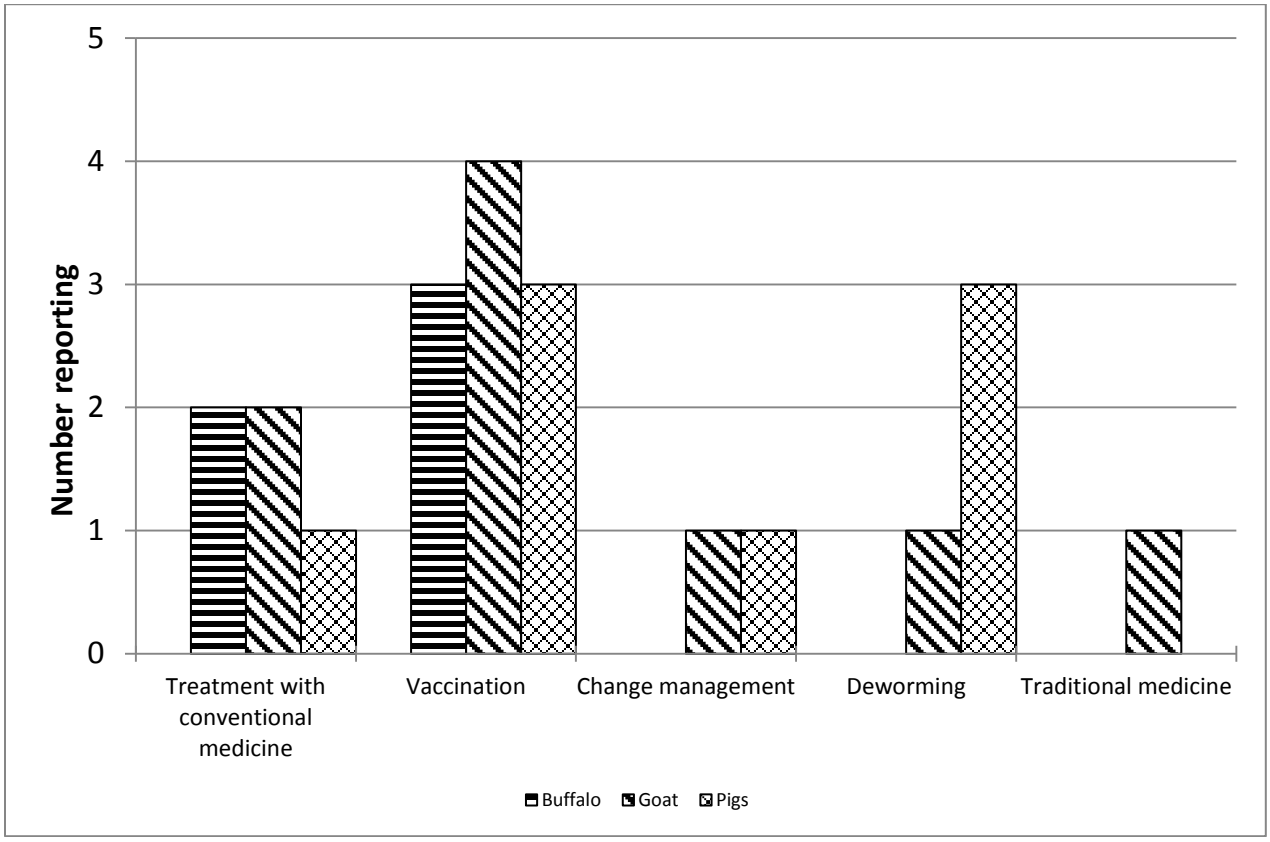

Figure 6: Health management Practices Promoted
Note: This was a multiple response question where (N = 22)

3.3.5 Livestock Marketing

Higher self-assessments of knowledge were made about livestock product marketing than value chain activities for all species. Comparisons across species also showed that higher self-assessments of knowledge about marketing aspects were reported for small animals than large ruminants. More partners had better knowledge about the marketing activities for goats than pigs. Five of six partners had an average knowledge of goat marketing while three partners had an average knowledge of the goat value chain. Half of the partners (3) reported an average knowledge about marketing of pigs while one partner reported good knowledge

about pig marketing and value chain activities respectively but an equal number (2) of partners reported either a good average or poor knowledge about pig marketing aspects.

More partners agreed in their attitudinal statements that small scale production could be improved to semi commercial production. More respondents disagreed (n = 2) or strongly disagreed (n = 4) than those that strongly agreed (n = 5) that because free range/backyard animal production is a way of life, household incomes could not be increased (Appendix 8). A similar question phrased differently confirmed more positive results. Seven respondents agreed that the increase in incomes could be doubled with improved backyard or free range production. Nine partners mostly agreed that livestock producers sold their meat at farm gate prices and did not take the initiative to access further markets to reduce on their transaction costs (Figure 7).

More partners had better knowledge about the marketing activities for goats than pigs. Five of six partners had an average knowledge of goat marketing while three partners had an average knowledge of the goat value chain in Jharkhand and Uttarakhand. Half of the partners (n = 3) reported an average knowledge about marketing of pigs while one partner reported good knowledge about pig marketing and value chain activities respectively but an equal number (n = 2) of partners reported either a good average or poor knowledge about pig marketing aspects in Jharkhand and Nagaland.

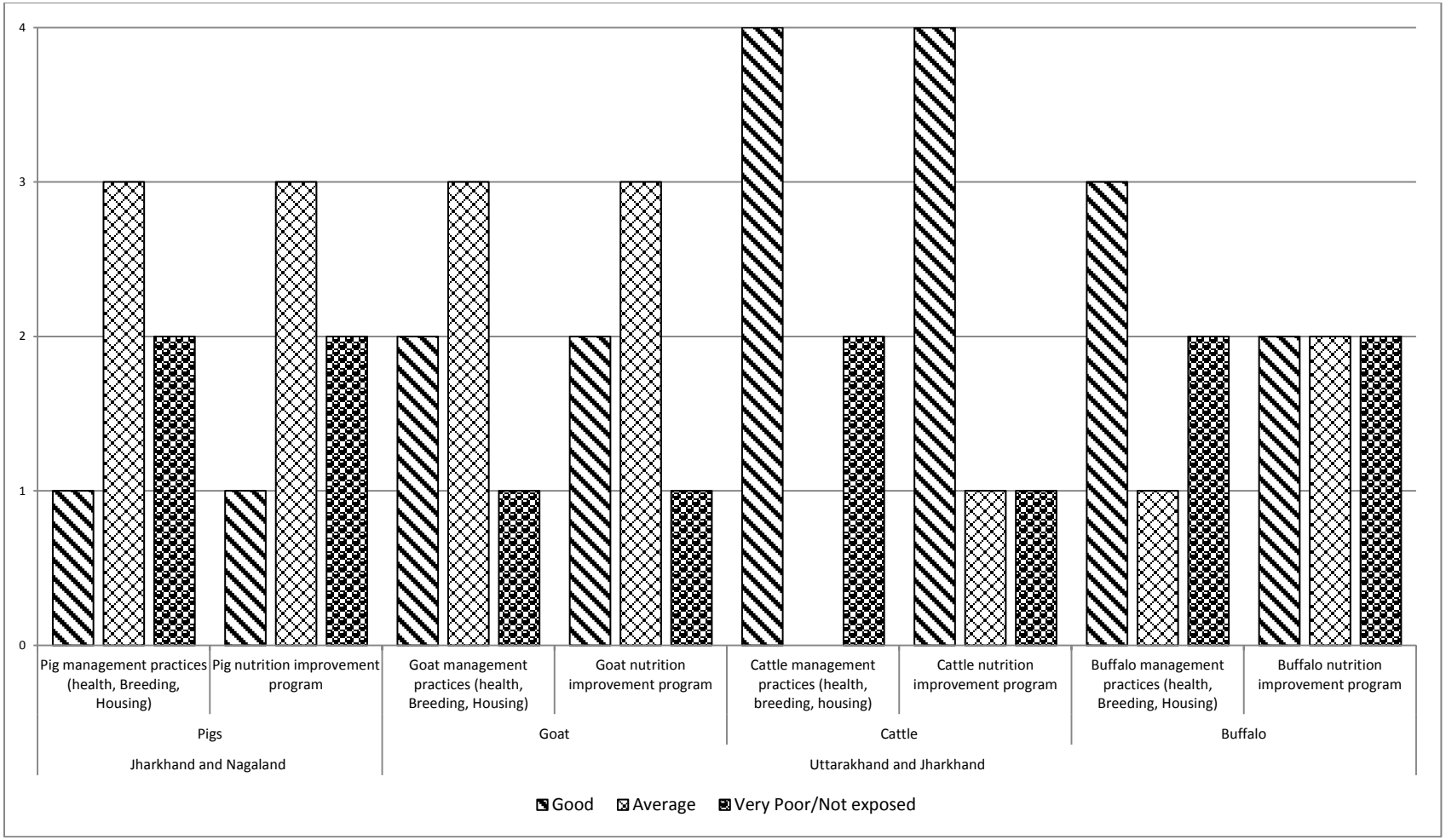

Figure 7: Knowledge about livestock marketing and value chain activities
Notes n = 12 (Jharkhand and Nagaland n = 6 and Uttarakhand and Jharkhand n = 6)

Sound market support services are critical for enhancing livestock productivity and for enabling the poor to gain access to expanding markets (Ahuja and Redmond 2001). Despite this we found that partners promoted limited market activities for livestock (Table 10). The major forms of market activity reported by partners were the promotion of livestock producer groups, that were involved in value chains and community based organizations. On the other hand four partner organizations (ULDB, PH, NEEDS, and APFD) did not report the promotion of any market and value chain activities amongst livestock producers.

Table 10: Type of market participation promoted

Partner	Marketing activities promoted by partners
CHIRAG	Livestock producer groups, cattle feed livestock producer group
HGVS	Livestock Producer groups in the market value chain
MVDA	Livestock Producer groups in the market value chain
NBJK	Community Based Organization
Sankalp	Livestock producer groups in the market value chain
SUPPORT	Community Based Organization
Total number of partners	

Source: KAP Survey data

3.4 Summary of Service Provision by ELKS Partners

An overview of services provided by partners is shown in Table 11. The shaded sections show services provided by each partner. ULDB, HGVS, CHIRAG, and MVDA provided services across the different management and marketing aspects for cattle, buffalo and goats. CHIRAG reportedly provided an array of services, across all aspects, but the larger organizations such as ULDB, did not provide health management services for cattle and buffalos while HGVS did not promote technologies as a combined technological package. Less support was provided for pigs by SUPPORT, CINI and APFD. Fewer services were provided for pigs by partners who mainly promoted sty feeding, also, no one service was commonly provided by all the concerned partners as was the case with the services provided for cattle, buffalo and goats.

Table 11: Summary of service provision by partners

	Partner	ULBD	HGVS	CHIRAG	MVDA	SUPPORT	NBJK	SRTT–CINI	AFPD	PH	NEEDS	Sankalp	HS
	Livestock type	C/B	C/B	C/B/G	C/B/G	P	P	P	P	P	G	C/B/G/P	C/B/G
Combined technological packages													
Service provision	Training												
	Input supplies												
	Livestock management												
	Marketing												
Cross breeds	Cattle												
	Pigs												
Indigenous breeds	Goats												
AI	Cattle												
	Buffalo												
Combined stall feeding and grazing	Cattle												
	Buffalo												
Combined stall feeding and browsing	Goats												
Sty feeding	Pigs												
Concentrates	Cattle												
	Buffalo												
Silage	Pigs												
Keeping Livestock in the house	Cattle												
	Buffalo												
	Goats												
	Pigs												
Vaccination	Buffalo												
	Goats												
	Pigs												
Conventional medicines	Buffalo												
	Goats												
Change management	Pigs												
Promotion of producer groups													

4 CHAPTER IV: CONCLUSIONS AND RECOMMENDATIONS

There was a difference between partners whose capacities had been built and those who had built capacities of other stakeholders. Half the partners had been trained but only one third of these partners reported that they had provided capacity building services to other partners. The capacity built was limited to livestock production and management practices for all species except buffalos. Capacities were limited in value chain management aspects (with the exception of goats) and policy dialogue probably because these aspects were not the participants' area of expertise. No training was provided for buffalos.

A general comparison of partners' self-assessments across categories showed higher knowledge levels about project related aspects than animal production and marketing aspects but comparisons between the latter two aspects showed that knowledge about market aspects were perceived to be lower than for livestock management practices. This result is congruent with partners' capacity building level where capacities have been enhanced primarily on livestock management practices for all species and limited in value chain management. A comparison across categories for all species shows that knowledge levels for livestock production aspects are higher for cattle than for the small animals. The reverse was true for the marketing aspects where higher statistics were reported as average for goat and goat product and value chain aspects. Expectantly the level of knowledge was consistently low for buffalo across both production and marketing aspects again consistent with the zero input on capacity building for this livestock type. Capacities on livestock production and management have been limited and more so for market aspects and policy dialogue with the result that the partners' perception in these aspects is consistent with this low capacity.

Partners need to work together to provide more synchronized and coordinated services to enhance, and even double, incomes of livestock owners. An attitude change is required in the notion that improved feeding and breeding practices are expensive and time consuming. Positive attitudes need to be re-enforced in the increased potential for backyard production for increased incomes and transformation to semi commercial production. While attitudes were positive on marketing aspects, limited marketing activities were promoted for all livestock by the partners. This, alongside limited promotion of cross breeds by partners for only pigs and cattle, would need to be reversed by the project to increase market led production and productivity.

This study gives a baseline indication of the knowledge attitude and practices of selected partners of the ELKS project. Partners were more involved in livestock management activities than value chain management activities with NBJK, MVDA, and SUPPORT being more involved in the service provision of all aspects. The partners were engaged in limited training opportunities and activities and also provided limited training to stakeholders on animal production aspects. Building capacities of livestock owners by partners is expected to form a critical component of this study to change attitudes and use and uptake of animal production technologies. Capacities on policy dialogue, market research and enhancement of value chain activities need to be improved particularly for pigs, goats and buffalos. The partners were more knowledgeable on large ruminant production and management systems than small animals. Partners' capacities need to be enhanced in animal management aspects (use and promotion of cross breeds, participation and strengthening value chain activities). Value chain activities that most partners reported were engaged in were the organization of the livestock producers into marketing groups. Strengthening value chain activities needs to begin with the value chain analysis by the different stakeholders. With the innovation systems method that uses value chain approach; this shall be entirely possible by ensuring a stakeholder analysis at the state level to provide an inventory of the stakeholders available at the baseline.

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Appendix 1: Participants of the ELKS KAP baseline survey

Name of Participant	Gender	Organizational affiliation	Position in organization	Type of organization	State	Email	Telephone
Dr Ratno	M	SRTT–NEI	Team leader	NGO	Nagaland	dratno@tata.com	09612934363
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Dr S.S. Srivastava	M	ULDB	District Manager and Public information officer	Government	Uttarakhand	sss332006@rediffmail.com	9411676434
Tej Singh	M	CHIRAG	–	NGO	Uttarakhand	info@chirag.org	09412085732
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Durjodaan P D Roy	M	NEEDS	Field extensionist	NGO	Jharkhand	needspostmaster@gmail.com	09771405861
Umblan Naj	M	NBJK	Field coordinator	NGO	Jharkhand		08084745846
Swati Singh	F	SRTT–CINI	Coordinate knowledge Management	NGO	Jharkhand	Swati.s@cinicell.org	0916572311059
Golden S Captain	M	SUPPORT		NGO	Jharkhand	goldencaptain@yahoo.com	09431936233
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Appendix 2: ELKS partners and selected activities

Region/State	District/Block	Village Name	Species	Partners
North East/ Nagaland	Kohima	4—Viswema, Jakhama, Khonoma, Mezoma	Pig	NEPED
	Mokokchung	4—Longkhum, Ungma, Mopungchukit, Chuchuyimlang		
	Wokha	4—Longsa, Ponyitong, Ponyitong, Longsachung		
	Dimapur	6—Sirhima, Amaluma, Ganesh Nagar, Dhansiripar, Doyapur		Prodigals' Home
North East/ Mizoram	Aizwal	2—Sihfa, Dilkhan and Tualbung (Cluster of villages), Khanpui		CODNERC
	Kolasib	1—Bilkhawthlir		OPEN DOORS
Jharkhand	Deoghar/Palajori	20—Thengadih, Nawadih, Manjurjilla, Basbutia, Parnagariya, Gadi, Jainagra, Dumariya, Madhopur, Kenduatand, Rampur chnraidih, Baijnathpur, Simla, Dubrajpur, Moranga, Sekhar nawadih, Barmasia, Lakhibad, Agaya, Suggi Pahari	Goat	NEEDS
	Gumla / ?	20 Villages (Mala to indicate name of villages)	Goat	PRADAN
	Hazaribag/Dadi	20—Kura, Khapia, Kanki, Chainpur, Rikwa, Tongi, Baskudra, Suyadih, Bhurkunda, Kodwe, Rabod, Senegarha, Mesrainmorha, Chanaro, Sarbaha, Kajari, Bali, Chichikhurd, Chichikala, Belgara	Pig	SUPPORT
	Khunti/Murhu and Khunti	20—Udburu, Saidba Daudih, Mileburu, Digri, Rongo, Saparum, Bhursu, Lupungdih, Maranghatu k, Kudahatu, Ayubhatu, Jordag Salga, Patratoli k, Bara Salga, School Salga, Jhikilata, Janum piri, Ulidih, Gutuhatu, Anidih	Pig	NBJK
Uttarkhand	Tehri Garhwal	10—Paukhal, Gewali, Swadi, Gadolia, Koti, Jakhedi, Kwali, Kandi, Flenda, Undoli	Cattle (breeding in all 10 and DP in 6)	MVDA
	Tehri Garhwal (goat)	5—Paukhal, Gewali, Swadi, Gadolia, Koti	Goat	
	Pithoragarh	10—Ganora, Bhuvneshwar, Footsil, Kotehra, Rankot, Simalkot, Itana, Tunta, Jwal, Barura	Cattle (breeding)	HGVS
	Chamoli	5—Meltha, Kotgwar, Bhenta, Devrara, Tungeshwar	Goat	Sankalp Samiti

Appendix 3: ELKS Knowledge, Attitude and Practice (KAP) Baseline Survey

Date

Name of the partner organization you work for:

Background information
Respondent's name _____
Gender of the respondent (Tick): 1 = Female_____ 2 = Male _____
Type of partner organization: _____ (e.g. Government/policy, NGO)
Level of operation (Tick): 1 = National _____ 2 = State _____ 3 = District _____
The State in which you operate: _____
Position you hold in the organization: _____

Presence of partners in TATA–ILRI PROJECT villages
Your organization's activities in project villages:
List all the animal projects your organization works on in the TATA–ILRI project villages

District	Number of villages *	Type of animal project (code a)	Approximate number of farmers involved	Type of activities (code b)	Project partners you have? (name)

Code a:		**Code b:**	
1 = Buffalo 2 = Pig 3 = Cattle 4 = Poultry	5 = Goat 6 = Sheep 7 = Mithun 8 = Donkey / Horse 9 = Other (specify)	1 = Input supply 2 = Animal management (breeding, feeding, health, housing) 3 = Training 4 = Marketing	5 = Supply of animals 6 = Other (specify) [For multiple activities enter all separated by comma—e.g. 1,4]

**** This is the number of TATA–ILRI project villages in which your organization has other animal projects. If number is more than one then list the names of the villages on the last page of this survey***

Knowledge of technical ASPECTS OF Cattle/buffalo/goat production in Uttarakhand STATE
Knowledge
How would you assess your current knowledge in the following areas:

Knowledge	Assessment
Cattles	
Cattle management practices (breeding, housing, health)	
Cattle nutrition improvement program	
Cattle and cattle product market research and marketing	
Cattle value-chain management	
Buffalo	
Buffalo management practices (breeding, housing, health)	
Buffalo nutrition improvement program	
Buffalo and buffalo product market research and marketing	
Buffalo value-chain management	
Goats	
Goat management practices (breeding, housing, health)	
Goat nutrition improvement program	
Goat and Goat product market research and marketing	
Goat value-chain management	
Other	
Development of business plans and business skills	
Project management	
Monitoring and evaluation	
Participation in policy dialogue	
Integrating gender aspects into project design and implementation	
Codes	
1 = Very good, 2 = Good, 3 = Average, 4 = Poor 5 = Very poor 6 = Not exposed	

Were you trained in any of the following aspects in the last **3 years**?

Type of training	Were you trained?	Was the training satisfactory?	**Why** satisfactory / not satisfactory?
Cattle breeding, housing and/or health management practices			
Cattle nutrition improvement program			
Cattle value-chain management			
Buffalo breeding, housing and/or health management practices			
Buffalo nutrition improvement program			
Buffalo value-chain management			
Goat breeding, housing and/or health management practices			
Goat nutrition improvement program			
Goat value-chain management			
Participation in policy dialogue			
Codes:	0 = No, 1 = Yes		

What training materials did you use to train Cattle/Buffalo/Goat farmers? (Provide title / author of material / organization who developed the material)

Have you been able to train any other stakeholders in the last three years? Please provide the details.

	Did you train other stakeholders in the last 3 years (code a)	From which district did the trainees originate	When was the training conducted (MM/YY)	Number of people trained	FOR which organization and level was the training conducted?	
					Organization	Level (code b)
Cattle breeding, housing and/or health management practices						
Cattle nutrition improvement program						
Cattle value-chain management						
Buffalo breeding, housing and/or health management practices						
Buffalo nutrition improvement program						
Buffalo value-chain management						
Goat breeding, housing and/or health management practices						
Goat nutrition improvement program						
Goat value-chain management						
Participation in policy dialogue						

Code a			**Code b**		
0 = No	1 = Yes—training by my organization	2 = Yes—training organized but out-sourced	1 = Project partner level	2 = Community groups (e.g. livestock producers)	3 = Individual Livestock owners

Attitudes
Please rate the following aspects of Cattle/Buffalo/Goat production—enter the code for your response

Codes: 1 = Strongly agree, 2 = agree, 3 = Neither agree nor disagree, 4 = disagree, 5 = Strongly disagree	
Goat production systems have an adverse effect on the environmental (i.e. degradation) and therefore its promotion and sustainable integration is challenging in the Uttarakhand State	
Access to services for Cattle/Buffalo/Goat production in Uttarakhand state is a much bigger issue than the shortage of fodder issue	
No favourable bylaws and policies supporting the management (feeding, health, breeding, housing) production, productivity and marketing of Cattle/Buffalo/Goat in the Uttarakhand region exist	
Household incomes for Cattle/Buffalo/Goat-keeping families in Uttarakhand State could be ***doubled*** with improvement in livestock owners capacities to use better feed resources and improved breeds	
Partners (NGO's and similar groups) in Uttarakhand work independently of one another within districts, hence it would be challenging to organize themselves to implement an integrated Cattle/Buffalo/Goat service delivery program	
Cattle/Buffalo/Goat producers mostly sell their Cattles/Buffalo/Goats and meat at the ***farm gate*** (to traders / middle-men) because other market outlets are inaccessible, however they are unaware of the high transaction costs that they are charged	
Controlled mating (selection of specific bull/buck to mate with dam/doe) is mainly practised to reduce Cattle/Buffalo/Goat mortality and increase Cattle/Buffalo/Goat productivity in Uttarakhand State	
It is not easy to improve the production and productivity of Cattle/Buffalo/Goat because Cattle/Buffalo/Goat owners perceive the use of improved feeding and breeding practices as expensive and too time consuming.	

Please rate the following aspects of pig production—enter the code for your response

Codes: 1 = Strongly agree, 2 = agree, 3 = Neither agree nor disagree, 4 = disagree, 5 = Strongly disagree	
Backyard Pig is a way of life and household income from production cannot be increased in the North East Region	
Access to services for Pig production in North East region is a much bigger issue than the control of swine fever and the adoption of clean hygienic practices	
No favourable bylaws and policies supporting the management (feeding, health, breeding, housing) production, productivity and marketing of Pig in the North East Region exist	
Household incomes for pig-keeping families in North East region could be ***doubled*** with improvement in backyard pig production	
Partners (NGO's and similar groups) in North East State work independently of one another within districts, hence it would be challenging to organize themselves to implement an integrated Pigs service delivery program	
Pig producers mostly sell their Pigs, and pork at the ***farm gate*** (to traders / middle-men) because other market outlets are inaccessible, however they are unaware of the high transaction costs that they are charged	
Controlled mating (selection of specific boar to mate with sow) is mainly practised to reduce pig mortality and increase pig productivity in North East region	
It is not easy to improve the production and productivity of pig because pig owners perceive the use of improved feeding and breeding practices as expensive and too time consuming.	

Current Use of Cattle/Buffalo/goat breeding, management, and marketing
Breeding practices

Cattle Breeding Practices		
Which Cattle breeds do you promote to your stakeholders?	What Cattle breeding practices do you promote	What sources of breeding bulls do you promote?
Codes: 1 = Local (non-descript, indigenous to India) 2 = Red Sinhi (indigenous) 3 = Sahiwal (indigenous) 4 = Other indigenous (give name if known) 5 = Holstein–Friesian (exotic) 6 = Jersey (exotic) 7 = Other (specify, if crossbreed, indicate cross of ___x___)	**Codes:** 1 = Controlled mating 2 = Other (Specify)	**Codes:** 1 = From farmer's own herd 2 = Loan/exchange breeding male with neighbours 3 = Hire the breeding male 4 = Use male from the research station 5 = Purchase from market 6 = Other (Specify)
Buffalo Breeding Practices		
Which Buffalo breeds do you promote to your stakeholders?	What Buffalo breeding practices do you promote	What sources of breeding bulls do you promote?
Codes: 1 = Local (non-descript, indigenous to India) 2 = Murrah (indigenous) 3 = Other indigenous (give name if known) 4 = Other (specify, if crossbreed, indicate cross of ___x___)	**Codes:** 1 = Controlled mating 2 = Other (Specify)	**Codes:** 1 = From farmer's own herd 2 = Loan/exchange breeding male with neighbours 3 = Hire the breeding male 4 = Use male from the research station 5 = Purchase from market 6 = Other (Specify)
Goat Breeding Practices		
Which Goat breeds do you promote to your stakeholders?	What Goat breeding practices do you promote	What sources of breeding bucks do you promote?
Codes: 1 = Local (non-descript, indigenous to India) 2 = Black Bengal (indigenous) 3 = Beetal (indigenous) 4 = Jamnapari (indigenous) 5 = Shirohi (indigenous) 6 = Barbari (indigenous) 7 = Jakhrana (indigenous) 8 = Other Indigenous (give name if known) 9 = Saanen (exotic) 10 = Alpine (exotic) 11 = Angora (exotic) 12 = Other (specify, if crossbreed, indicate cross of ___x___)	**Codes:** 1 = Controlled mating 2 = Other (Specify)	**Codes:** 1 = From farmer's own herd 2 = Loan/exchange breeding male with neighbours 3 = Hire the breeding male 4 = Use male from the research station 5 = Purchase from market 6 = Other (Specify)

Management practices—Feeding

Cattle Feeding Practices		
What types of feeding practice do you promote	What types of feed do you promote	What do you think are the main constraints to Cattle feeding
Codes (for cattle and buffalo): 1 = Grazing 2 = Stall feeding 3 = Both 4 = Other (specify)	**Codes (for cattle and buffalo):** 1 = Dry fodder/vegetation 2 = Green fodder/vegetation 3 = Concentrates (incl. cakes and brans) 4 = Silage 5 = Other (specify)	**Codes (for cattle and buffalo):** 1 = Lack of feeds 2 = Lack of fuel wood to cook feeds 3 = No feeding area 4 = Too much time spent on collecting of feed stuff 5= higher price of feed 6 = Cost of feed transportation 7 = Other (specify)
Buffalo Feeding Practices		
What types of feeding practice do you promote	What types of feed do you promote	What do you think are the main constraints to Buffalo feeding
Goat Feeding Practices		
What types of feeding practice do you promote	What types of feed do you promote	What do you think are the main constraints to Goat feeding
Codes: 1 = Browsing 2 = Stall feeding 3 = Both 4 = Other (specify)	**Codes:** 1 = Dry fodder/vegetation 2 = Green fodder/vegetation 3 = Concentrates (incl. cakes and brans) 4 = Silage 5 = Other (specify)	**Codes:** 1 = Lack of feeds 2 = Lack of fuel wood to cook feeds 3 = No feeding area 4 = Too much time spent on collecting of feed stuff 5 = higher price of feed 6 = Cost of feed transportation 7 = Other (specify)

Management Practices—Housing and Health

Current housing practices of Cattles, Buffalo and Goats		
Cattle Housing practices	**Buffalo Housing Practices**	**Goat Housing Practices**
What main modes of Cattle housing are you promoting?	What main modes of Buffalo housing are you promoting?	What main modes of Goat housing are you promoting?

Codes:
1 = Open fenced area, 2 = Walled shed (no roof), 3 = Walled and tin roofed shed, 4 = In the house, 5 = Other (specify)

Current health control practices promoted of Cattle, Buffalo and Goat			
Cattle Health practices		**Buffalo Health Practices**	
Most common diseases for Cattles	What prevention and treatment measures do you promote?	Most common diseases for Buffalo	What prevention and treatment measures do you promote?

Codes (Diseases):
1 = Trypanosomosis, 2 = Tick borne diseases (other), 3 = Foot & Mouth Disease (FMD), 4 = Contagious Bovine Pleuropneumonia (CBPP), 5 = Anthrax, 6 = Tetanus, 7 = Blackquarter, 8 = Heartwater, 9 = Mastitis, 10 = Parasitic-worm infestation, 11 = Other (specify)

Codes (prevention and treatment):
0 = none, 1 = treatment with conventional medicine, 2 = traditional medicine (e.g. herbs), 3 = Surgery, 4 = De-worming, 5 = Vaccination, 6 = Change in management (housing, feeding), 7 = Other (specify)

Goat Health Practices	
Most common diseases for Goat	What prevention and treatment measures do you promote?

Codes:	**Codes:**
1 = Anthrax, 2 = Bronchitis, 3 = Dysentry, 4 = Goat Pox, 5 = Parasitic-worm infestation, 6 = Enterotoxaemia, 7 = Dematitis, 8 = PPR, 9 = CCPP, 10 = Mastitis, 11 = Foot and Mouth (FMD), 12 = Pneumonia (not CCPP), 13 = Other (specify)	0 = none, 1 = treatment with conventional medicine, 2 = traditional medicine (e.g. herbs), 3 = Surgery, 4 = De-worming, 5 = Vaccination, 6 = Change in management (housing, feeding), 7 = Other (specify)

Are the above management technologies being promoted in the districts in which you operate this year? _____ (0= No, 1 = Yes)
If yes to 0, are the technologies being promoted as a 'combined delivery service' (i.e. as an integrated package)? _____ (0 = No, 1 = Yes)
If Yes to 0, in how many districts are you promoting these combined management technologies this year?
If No to 0, why not? What are the difficulties in promoting the delivery of combined management technologies?

_____

Are there any community based animal health programs in your communities?
_____ **(**0 = No, 1 = Yes)
If Yes to 0, how many districts have access to community based animal health programs this year? _____
If No to 0, why do you think there are none? Should these, and how could these, be started?

Marketing
Are you promoting the participation of the livestock owner in market value chain activities this year? _____ (0 = No, 1 = Yes)
If yes to 0, describe in which types of activities?

Additional Section for Comments and List of villages from Section 0

_____
_____
_____

Partner Codes:

Organization Name	Code	Organization Name	Code
Himmotthan Society	HIMM	Prodigal's Home	PH
Uttarakhand Livestock Development Board	ULDB	Agency for Porcine Foundation and Development of Nagalanda (APFADON)	APFA
Mount Valley Development Association	MVDA	Sir Ratan Tata Trust—North East Initiative	SRTT–NEI
Society for Upliftment of People through People Organization and Rural Technology	SUPPORT	Network for Enhancement and Enterprises and Development Support	NEEDS
Himalayan Gram Vikas Samiti	HGVS	Nav Bharat Jagriti Kendra	NBJK
Sankalp Samiti Tharali	SST	Central Himalayan Rural Action Group	CHRAG
Nagaland Empowerment of People Through Economic Development	NEPED	Professional Assistance for Development Action	PRADAN
Central Himalayan Rural Action Group	CHRAG	Collectives for Integrated Livelihood Initiatives	CINI

Appendix 4: Services and capacity building provided

			Jharkhand and Uttarakhand	Uttarakhand			Nagaland and Jharkhand
Name of partner	**Number**	**Type of service**	**Goat**	**Buffalo**	**Cattle**	**Poultry**	**Pigs**
APFD, CINI, CHIRAG, HGVS, MVDA, NBJK, NEEDS, SUPPORT, ULDB	9	Training (n = 28)	12	1	2	1	12
APFD, CINI, NBJK, NEEDS, MVDA, SUPPORT, ULDB,	7	Input supplies(n = 25)	11	0	1	1	12
APFD, MVDA, NBJK,, SUPPORT, ULDB	5	Supply of animal feeds(n = 9)	2	0	1	1	5
All	11	Livestock management (n = 48)	13	10	3	1	21
CINI, CHIRAG, MVDA, NEEDS, SUPPORT, NBJK,	6	Marketing (n = 25)	11	1	1	1	11

Aspect stakeholders were trained on	**Training method used**	**Year of training**	**Number trained**	**Recipient**	**Training level**
Jharkhand and Uttarakhand					
Cattle breeding, housing and or health management practice	Organization (1)	All year round	17,000	Range of stakeholder	Partner, community and individual
Cattle nutrition	By organization (2)	From 2003 to 2010	17,200	Range of stakeholder	Partner, community and individual
Cattle value chain	By organization (1)	All year round	17,000	Range of stakeholder	Partner, community and individual
Buffalo nutrition	By organization (1)	2009	20	Livestock producers	Partner, community and individual
Goat breeding, housing health management practices	By organization (1)	2007–2010	139	NEEDS	Community groups and partner level
Jharkhand and Nagaland					
Pig breeding, housing health management practices	Organization and Outsourcing (3)	2010	270	Veterinary Department and CINI	Partner level and individual farmer level
Pig nutrition improvement program	Outsourced (1)	2010	70	CINI and NABARD	Partner level
All states					
Participatory policy dialogue	–	–	–	–	–

Appendix 5: Partners promoting livestock breeds and breeding practices

Goat breeds and breeding practices promoted			
Partner	**Goat Breeds Promoted**	**Goat Breeding Practices**	**Sources of Bucks**
HGVS	- Local (non descript, indigenous to India)	Controlled mating	- From farmers own herd, - Loan/exchange breeding male with neighbours
PH	- Black Bengal (indigenous)		
MVDA	- Shirohi (indigenous), - local (non descript, indigenous to India)		- From farmers own herd, Loan/exchange breeding male with neighbours
NEEDS	- Local (non descript, indigenous to India), - Black Bengal (Indigenous), - Beetle (indigenous), - Barbari (indigenous), - Jamnapari (indigenous)	Controlled mating	- From farmers own herd, - Loan/exchange breeding male with neighbours, - Hire the breeding male, - Use male from research station and - purchase from market
Sankalp	- Shirohi (indigenous), Barbari (Indigenous)	Controlled mating	- From farmers own herd, Loan/exchange breeding male with neighbours
Cattle breeds and breeding practices promoted			
Partner	**Cattle breeds promoted**	**Cattle Breeding Practices**	**Cattle bulls**
HGVS	- Local (non-descript, indigenous to India), - Jersey (exotic)	AI	- Local (non-descript, indigenous to India)
CHIRAG	- Red Sinhi (indigenous), - Jersey (exotic)	Controlled mating, AI	-
ULDB	- Red Sinhi (indigenous), - Sahiwal (indigenous), - Jersey × HF cross	Controlled mating and AI	- Local (non-descript, indigenous to India), CHRS, Rohtak
MVDA	- Red Sinhi (indigenous)	-	- Local (non-descript, indigenous to India)
Sankalp	- Red Sinhi (indigenous), - Sahiwal (indigenous)	Controlled mating	- Local (non-descript, indigenous to India)
Pig breeds and breeding practices promoted			
Partner	**Pig breeds promoted**	**Pig Breeding Practices**	**Source of Boars**
SUPPORT	- Tamworth × Desi	Controlled mating	- From farmers own herd - Hire breeding male
NBJK	–	Controlled mating	- From farmers own herd, - purchase from the market, - use male from research station - hire breeding male
PH	- Local (non-descript, indigenous to India)	–	- Loan/exchange breeding male with neighbours
SR TT	- Gungroo (indigenous-long snout), - Large Black (exotic) , - Hampshire (exotic)	–	- Hire the breeding male

APFD	- Hampshire (exotic)	Controlled mating	- Use male from the research station
Buffalo breeds and breeding practices promoted			
Partner	**Buffalo breeds promoted**	**Buffalo breeding practice**	**Source of Bulls**
HGVS	- Local (non-descript, indigenous to India) - Murrah (indigenous)		
CHIRAG		Controlled mating, and AI	
ULDB	- Murrah (indigenous)	Controlled mating and AI	- From farmers own herd, - CHRS Rohtak
MVDA	- Murrah (indigenous), - Local (non-descript, - indigenous to India)	AI	- From farmers own herd, - Loan/exchange breeding male with neighbours
Sankalp	- Murrah (indigenous)	Controlled mating	- From farmers own herd, - Loan/exchange breeding male with neighbours

Appendix 6: Partners promoting different feed types and feeding practices

Goat feeds and feeding practices		
Partner	**Goat Feeding Practices**	**Goat Feeds**
HGVS	Browsing	Dry fodder/vegetation and Green fodder/vegetation
MVDA	Browsing	Dry fodder/vegetation and Green fodder/vegetation
NEEDS	Browsing and stall feeding	
Sankalp	Browsing and stall feeding	Silage
HS	Browsing and stall feeding	
CHIRAG	Browsing and stall feeding	Dry fodder/vegetation and Green fodder/vegetation
Cattle feeds and feeding practices		
Partner	**Cattle Feeding Practices**	**Cattle Feeds**
HGVS	Grazing and Stall feeding	Dry fodder/vegetation and Green fodder/vegetation
CHIRAG	Grazing and Stall feeding	Dry fodder/vegetation, Green fodder/vegetation and Concentrates
ULDB	Stall feeding	Dry fodder/vegetation, Green fodder/vegetation, silage and Concentrates
MVDA	Grazing and Stall feeding	Dry fodder/vegetation, Green fodder/vegetation and Concentrates
Sankalp	Grazing and Stall feeding	Silage and Concentrates incl. cakes and Brans
HS	Grazing and Stall feeding	Silage and Concentrates incl. cakes and Brans
Pig feeds and feeding practices		
Partner	**Pig Feeding Practices**	**Pig Feeds**
SUPPORT	Stay feeding	Dry fodder/vegetation and Silage
NBJK	Stay feeding	Green fodder/vegetation and Silage
PH	Stay feeding	Dry fodder/vegetation, Silage , Green fodder/vegetables and Concentrates
SR TT	Stay feeding	
APFD	Stay feeding	Dry fodder/vegetation
Buffalo feeds and feeding practices		
Partner	**Buffalo Feeding Practices**	**Buffalo Feeds**
HGVS	Stall feeding and grazing	Dry Fodder/Vegetation, Green fodder/Vegetation and Concentrates
ULDB	Stall feeding and grazing	Dry Fodder/Vegetation, Green fodder/Vegetation and Concentrates
MVDA	Stall feeding and grazing	Dry Fodder/Vegetation
Sankalp	Stall feeding and grazing	Silage and Concentrates
HS	Stall feeding and grazing	Concentrates

Appendix 7: Partners promoting housing practices

Partners	**Cattle Mode of Housing Promoted**
MVDA, HGVS	Walled shed (roof)
Sankalp	Mudstone
HS	stone and mud house
CHRAG	Open fenced area
ULDB	In the house
Partner	**Buffalo Mode of Housing promoted**
MVDA	Walled shed (roof)
Sankalp	Mudstone
HS	Stone and mud house
CHIRAG, ULDB	In the house
Partners	**Goat Mode of Housing Promoted**
APFD, HS, MVDA	Walled shed (roof)
MVDA	In house, walled and tin roofed shed
NEEDS	Mudstone
Sankalp	Stone and Mud house
HGVS	Open fenced area
Partners	**Pig Mode of Housing Promoted**
SRTT–CINI, PH	Walled and tin roofed shed
APFD	In the house

Appendix 8: Knowledge of livestock management and market aspects

Aspects	Good	Average	Poor	Very Poor/Not exposed
Jharkhand and Nagaland (n = 6)				
Pig management practices (health, Breeding, Housing)	1	3		2
Pig nutrition improvement program	1	3		2
Pig/pig product market research and marketing	1	3		2
Knowledge in pig value chain management	2	2		2
Uttarakhand and Jharkhand (n = 6)				
Goat management practices (health, Breeding, Housing)	2	3		1
Goat nutrition improvement program	2	3		1
Goat and goat product market research and marketing		5		1
Goat value chain management	1	3	1	1
Cattle management practices (health, breeding, housing)	4			2
Cattle nutrition improvement program	4	1		1
Cattle and cattle product market research and marketing	3	1	1	1
Cattle value chain management	1	3	1	1
Buffalo management practices (health, Breeding, Housing)	3	1		3
Buffalo nutrition improvement program	2	2		2
Buffalo and buffalo product market research and marketing	2	2		2
Buffalo value chain management	1	1		4
Jharkhand, Uttarakhand, Nagaland (n = 11)				
Business management	3	3	2	3
Project management	5	3		3
Monitoring and evaluation	7	1	1	2
Participation in policy dialogue	3	4	1	2
Integrating gender into project design and implementation (n = 10)	5	2	1	2

Source: KAP Survey data

Appendix 9: Partners' attitudes

Attitude Statement[1]	Partner (s)	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Access services for Pig/goat production in Jharkhand state is a much bigger issue than the control of swine fever and the adoption of clean hygiene practices (n = 13)	CHRAG, CINI, HS, MVDA, NEEDS, PH, SUPPORT, SRTT		8			
	APFD, HGVS, NBJK			3		
	SST, ULDB					2
	Total		8(62)	3(23)		2(15)
2. Backyard pig/free range goat production is a way of life and HH income from production cannot be increased (n = 13)	CHRAG, SUPPORT, SRTT, HGVS, NBJK	5				
	HS, PH				2	
	NEEDS, APFD		2			
	SST, ULDB, MVDA, CINI					4
	Total	5(39)	2(15)		2(15)	4(31)
3. No favourable by laws and policies supporting the management (feeding, health, breeding, housing) production, productivity and marketing of pig/goat in the Jharkhand region exists (n = 12)	CHRAG, MVDA,SUPPORT, SRTT		4			
	CINI, APFD			2		
	NEEDS	1				
	PH, NBJK, ULDB					3
	SST, HS				2	
	Total	1(8)	4(33)	2(17)	2(17)	3(25)
4. HH incomes for pig/goat keeping families in Jharkhand state could be doubled with improved backyard pig production or free range got production (N = 13)	CHRAG, HS, MVDA, PH, SUPPORT, HGVS, NBJK	7				
	CINI				1	
	NEEDS, SRTT, APFD, SST		4			
	ULDB			1		
	Total	7(54)	4(30)	1(8)	1(8)	
5. Partners (NGO's and similar groups) work independently of one another within districts hence it would be challenging to organize themselves to implement an integrated pigs/goat service delivery program (n = 13)	CHRAG, MVDA, SUPPORT,SRTT				4	
	CINI, HS, NEEDS, PH, APFD, SST		6			
	HGVS, NBJK					2
	ULDB			1		
	Total		6(46)	1(8)	4(31)	2(15)
6. Pig/goat producers mostly sell their pigs/goats and pork/goat meat at the farm gate (to traders/middlemen) because other market outlets are inaccessible, however they are unaware of the high transaction costs that they are charged (n = 13)	CHRAG, PH			2		
	CINI				1	
	HS, MVDA, NEEDS, SUPPORT,SRTT, APFD, HGVS,NBJK, ULDB		9			
	SST					1
	Total		9(69)	2(15)	1(8)	1(8)
7. Controlled mating (selection of specific boar/buck to mate with the sow/de) is mainly practiced to reduce pig/goat mortality and increase pig/goat productivity in Jharkhand State (n = 12)	CHRAG, CINI, MVDA, NEEDS,PH, SUPPORT, SRTT, APFD, ULDB		9			
	HS, SST			2		
	NBJK				1	
	Total		9(75)	2(17)	1(8)	
8. It is not easy to improve the production and productivity of pig/goat because pig/goat owners perceive the use of improved feeding and breeding practices as expensive and too time consuming (n = 12)	CHRAG, SRTT				2	
	CINI, HS, MVDA, NEEDS, PH, SUPPORT, APFD, NBJK, SST, ULDB	10				
	Total	10(83)			2(17)	

1. The question on breeding strategies was a multiple response question with each partner providing a response for each livestock type.

Source: KAP Survey data

Appendix 10: Access to community based animal health program

Presence of Community based animal health program (n = 8)		
	Yes	**No**
	6(75)	2(25)
Organizations reporting presence/no presence of CAHPs	CHRAG, HGVS, NEEDS, PH , SUPPORT and ULDB	SRTT and APFD
Number of Districts	ULDB 13 districts	
	CHRAG, NEEDS, PH and SUPPORT reported presence of CAHPs in one district each	
Reasons why CAHPs lacks	SRTT–Government or NGO have not been able to promote the concept yet, sensitization and awareness with technical and backstopping should be supported to the community	
	APFD–lack of Knowledge to incorporate by training the villagers on its importance	

Source: KAP Survey data

Appendix 11: Disease prevention and treatment methods promoted

Partners	**Diseases prevention treatment by different partners (N = 12)**				
	Treatment with conventional medicine	Vaccination	De-worming	Traditional Medicine	Change in housing and feeding management practices
CHRAG		3	1	1	
HGVS	3				
HS		3			
MVDA	3				
SST		3			
ULDB		1			
NEEDS		2			1
APFD		1	1		1
NBJK		1			
PH			1		
SRTT		1	1		
SUPPORT	1	2	1		
Total	7	17	5	1	2

Partners	**Prevention and treatment for Buffalo**
CHRAG	Vaccination
Sankalp	Vaccination
HS	Vaccination
HGVS	Treatment with conventional medicine
MVDA	Treatment with conventional medicine
Partners	**Prevention and treatment for Goats**
Sankalp	Vaccination
HS	Vaccination
MVDA	Treatment with conventional medicine
NEEDS	Vaccination, Change in Management (Housing and Feeding)
HGVS	Treatment with conventional medicine, De-worming, Vaccination
CHRAG	Traditional Medicine (e.g. Herbs)
Partners	**Prevention and treatment for Pigs**
PH	De-worming
NBJK	Vaccination
Sankalp	De-worming, Vaccination
SUPPORT	Treatment with conventional medicine
APFDN	De-worming, Vaccination, Change management (housing and feeding)

Source: KAP survey data

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