

# Assessment of Core Competencies of Livestock Extension Professionals of Jammu and Kashmir State of India

**Discussion Paper 8**

MANAGE- Centre for Agricultural Extension Innovations, Reforms, and Agripreneurship (CAEIRA)



National Institute of Agricultural Extension Management (MANAGE)  
(An organisation of Ministry of Agriculture and Farmers' Welfare, Govt. of India)  
Rajendranagar, Hyderabad – 500 030, Telangana State, India  
[www.manage.gov.in](http://www.manage.gov.in)

## Published by

National Institute of Agricultural Extension Management (MANAGE)  
(An organisation of Ministry of Agriculture and Farmers' Welfare, Govt. of India)  
Rajendranagar, Hyderabad – 500 030, Telangana State, India

©MANAGE, 2019

## About the Publication

The research report is based on the research conducted by Dr. Sheikh Shubeena as MANAGE Intern under the MANAGE Internship Programme for Post Graduate students of Extension Education.

## Authors

### Dr. Sheikh Shubeena

MANAGE Intern and PhD Research Scholar  
Sher-e-Kashmir University of Agricultural Sciences,  
Kashmir, Jammu and Kashmir  
e-mail: sheikhshubeena610@gmail.com

### Dr. Suchiradipta Bhattacharjee

MANAGE Fellow, Centre for Agricultural Extension Innovations and Reforms  
National Institute of Agricultural Extension Management (MANAGE)  
Rajendranagar, Hyderabad, Telangana, India  
e-mail: suchiradipta.b@manage.gov.in/ suchiradipta@hotmail.com

### Dr. Saravanan Raj

Director (Agricultural Extension)  
National Institute of Agricultural Extension Management (MANAGE)  
Rajendranagar, Hyderabad, Telangana, India  
e-mail: saravanan.raj@manage.gov.in/ saravananraj@hotmail.com

## Layout Design

Ms. Niharika Lenka

## Disclaimer

The views expressed in the document are not necessarily those of MANAGE but are of the authors' own. MANAGE encourages the use, reproduction and dissemination of this publication for personal study and non-commercial purposes only with proper acknowledgement of MANAGE.

Correct citation: Shubeena, S., Suchiradipta B., and Saravanan, R. (2019) Assessment of Core Competencies of Livestock Extension Professionals of Jammu and Kashmir State of India, Discussion Paper 8, MANAGE-Centre for Agricultural Extension Innovations, Reforms and Agripreneurship, National Institute for Agricultural Extension Management (MANAGE), Hyderabad, India.



## Director General's Message

**Smt. V. Usha Rani, IAS**  
Director General, MANAGE

I congratulate Dr. Sheikh Shubeena, MANAGE intern and Ph.D. Scholar, Sher-e-Kashmir University of Agricultural Sciences, Kashmir, Jammu and Kashmir, for selecting an apt topic for the current farming scenario "Assessment of Core Competencies of Livestock Extension Professionals of Jammu and Kashmir State of India" and collecting good data from field and analysis.

This paper in detail analyses the scenario of livestock extension system, its organization, regulation and operation in Kashmir valley and also the core competencies of the livestock extension professionals of that region. Information related to livestock extension systems and assessment of other core competencies. We all know that Livestock sector is expected to emerge as an engine of agricultural growth in view of rapid growth in demand for animal food products. Currently the scenario of the livestock extension departments and the professionals is not much impressive. The contacts of the livestock extension professionals with livestock related agencies, flow of information and linkage with livestock related agencies was found to be not enough as per the requirements.

Now-a-days there is an urgent need to provide knowledge and update para-vets regarding important core competencies according to their job, understanding and need. This current study revealed that the current knowledge and skill of the livestock extension professionals is not adequate. There is a big gap between the perceived importance and current level of knowledge. Pre-service training, in-service training through animal husbandry departments and veterinary colleges, international conferences, national workshops and constant sharing of the information between researchers and extension professionals were considered as the appropriate ways to acquire the core competencies.

(V.Usha Rani)

## Contents

Introduction .....	1
Core competencies .....	1
Role of livestock in economy .....	1
Livestock production in India.....	1
Scenario of Livestock extension system in India .....	2
Challenges in effective livestock extension services .....	4
Need to access core competencies in livestock extension professionals.....	5
Research methodology .....	6
Locale of the study .....	6
Sampling plan .....	6
Findings .....	7
Scenario of livestock extension organization in Kashmir .....	7
General information about the livestock extension professional .....	7
Contact with the other extension service providing extension agencies .....	8
Information flow through the Animal Husbandry department .....	9
Monthly activities going in livestock extension departments.....	9
Availability of various infrastructure facilities in veterinary centers .....	11
Linkage of livestock extension professionals with livestock related agencies and organizations	13
Livestock developmental programmes going in the Animal husbandry departments.....	14
Information related to dissemination of information and technology .....	15
Job satisfaction of the livestock extension professionals .....	16
Core competencies .....	17
Livestock Extension Related competencies .....	17
Livestock service and welfare related competencies.....	20
Communication competencies.....	23
Risk analysis competencies.....	25
Subject matter related competencies.....	28
Technical subject matter application competencies.....	29
Livestock extension programme planning competencies .....	32
Informational and technology competencies.....	34

Professional and leadership competencies .....	37
Organizational and management competencies .....	39
Diversity competencies.....	41
Appropriate ways to acquire the core competencies in livestock extension professionals .....	45
Conclusion .....	48
Recommendations.....	50
References .....	53

## List of tables

<b>Table no.</b>	<b>Title</b>	<b>Page no.</b>
1	Socio-economic parameters of the respondents	7

## List of figures

<b>Fig. no.</b>	<b>Title</b>	<b>Page no.</b>
1	Contacts of livestock extension professionals with livestock extension	8
2 (a)	Information flow efficiency through veterinary departments	9
2 (b)	Frequency of the information flow through livestock extension departments	9
3 (a)	Activities that come under the job profile of livestock extension professionals	10
3 (b)	Preferences given by livestock extension professionals to different monthly activities	10
3 (c)	Frequency of performing monthly activities by livestock extension professionals	10
4	Availability of various infrastructure facilities in Veterinary centers	11
5 (a)	Linkage type of extension professionals with livestock related agencies and organizations	12
5 (b)	Frequency of the linkage with livestock related agencies and organizations	13
6	Information related to dissemination of Information and technology	16
7 (a)	Job satisfaction	17
7 (b)	Level of job satisfaction of livestock extension professionals	17
8 (a)	Importance of livestock extension related competencies (veterinarians)	17
8 (b)	Importance of livestock extension related competencies (para-vets)	18
8 (c)	Level of knowledge professionals regarding extension related competencies (Veterinarians)	19
8 (d)	Knowledge level of livestock professional regarding extension related competencies (para-vets)	19
9 (a)	Importance of the livestock service and welfare related competencies in extension professionals (Veterinarians)	20
9 (b)	Importance of the livestock service and welfare related competencies in extension professionals (Para-Vets)	21
9 (c)	Knowledge level of livestock professionals regarding livestock service and welfare competencies (Veterinarians)	22
9 (d)	Knowledge level of livestock professionals regarding livestock service and welfare competencies (Para-Vets)	22

<b>Fig. No.</b>	<b>Title</b>	<b>Page no.</b>
10 (a)	Importance of communication competencies to livestock extension professionals (Veterinarians)	23
10 (b)	Importance of communication competencies to livestock extension professionals (Para-Vets)	24
10 (c)	Knowledge level of livestock extension professionals regarding the communication competencies (Veterinarians)	24
10 (d)	Knowledge level of livestock extension professionals regarding the communication competencies (Para-Vets)	25
11 (a)	Importance of risk analysis competencies (Veterinarians)	26
11 (b)	Importance of risk analysis competencies (Para-Vets)	26
11 (c)	Knowledge level regarding the risk analysis competencies (Veterinarians)	27
11 (d)	Knowledge level regarding the risk analysis competencies ( Para-Vets)	27
12 (a)	Importance of basic subject matter competencies (Veterinarians)	28
12 (b)	Importance of basic subject matter competencies (Para-Vets)	28
12 (c)	Knowledge level of livestock extension professionals regarding basic subject matter competencies (Veterinarians)	28
12 (d)	Knowledge level of livestock extension professionals regarding basic subject matter competencies (Para-Vets)	28
13 (a)	Importance of technical subject matter application competencies (Veterinarians)	30
13 (b)	Importance of technical subject matter application competencies (Para-vets)	30
13 (c)	Knowledge level regarding technical subject matter related competencies (Veterinarians)	31
13 (d)	Knowledge level regarding technical subject matter related competencies (Para-vets)	32
14 (a)	Importance of extension programme planning competencies (Veterinarians)	32
14 (b)	Importance of extension programme planning competencies (Para- Vets)	33
14 (c)	Knowledge level regarding livestock extension programme planning (Veterinarians)	33
14 (d)	Knowledge level regarding livestock extension programme planning (Para-Vets)	34
15 (a)	Importance of information and technology competencies (Veterinarians)	35
15 (b)	Importance of information and technology competencies (Para-Vets)	36

15 (c)	Knowledge level regarding informational and technological competencies (Veterinarians)	36
15 (d)	Knowledge level regarding informational and technological competencies (Veterinarians)	36
16 (a)	Importance professional and leadership competencies (Veterinarians)	37
16 (b)	Importance professional and leadership competencies ( Para-Vets)	37
16 (c)	Knowledge level regarding professional and leadership competencies (Veterinarians)	38
16 (d)	Knowledge level regarding professional and leadership competencies (Para-Vets)	38
17 (a)	Importance of organizational and management competencies (Veterinary)	39
17 (b)	Importance of organizational and management competencies (Para-Vets)	40
17 (c)	Knowledge level about organizational and management competencies (Veterinarians)	40
17 (d)	Knowledge level about organizational and management competencies (Para-Vets)	40
18 (a)	Importance of diversity competencies (Veterinarians)	42
18 (b)	Importance of diversity competencies ( Para-Vets)	42
18 (c)	Knowledge level about diversity competencies (Veterinarians )	43
18 (d)	Knowledge level about diversity competencies (Para-Vets)	44
19	Appropriate ways to acquire core competencies	45

## Abbreviations

AgGDP	Agricultural Gross Domestic Product
AV aids	Audi-visual Aids
B.V.Sc	Bachelor of Veterinary Sciences
BQ	Black Quarter
BVO	Block Veterinary Officer
CGIAR	Consultative Group on International Agricultural Research
DEDS	Dairy entrepreneurship development scheme
ECOP	Extension Committee on Organization and Policy
EDI	Entrepreneurship Development Institute
FAO	Food and Agricultural Organization
FMD	Food and Mouth Disease
GDP	Gross Domestic Product
HS	Haemorrhagic septicemia
IBD	Infectious Bursal Disease
ICT	Information Communication and technology
IDSRR	Integrated development of Small ruminants and rabbits
ILRI	International Livestock Research Institute
IOM	Innovation in Outcome Measurement
J&K	Jammu and Kashmir
KVK	Krishi Vigyan Kendra
M.V.Sc	Master of Veterinary Sciences
M.Sc.	Master of Science
NGOs	Non-Government Organization
OECD	Organization for Economic Co-operation and Development
OIE	Office International Des Epizooties
RCVS	Royal College of Veterinary Surgeons
RD	Rinderpest
SHG	Self Help Groups
SMS	Subject Matter Specialist
VAS	Veterinary Assistant Surgeon

## Abstract

With the changing global scenario and changing pattern of the agriculture extension professionals need to brace up with the new and required competencies. Among agriculture and allied sectors livestock sector is facing new challenges in terms of the production, adaptation, stress and occurrence of emerging and re-emerging diseases. The study to access the core competencies of livestock extension professionals was taken in the Kashmir division of Jammu And Kashmir State. Data was collected through an unstructured questionnaire from middle and low level livestock extension professionals. The competent livestock extension professionals are much needed resource of the hour. But currently the scenario of the livestock extension departments and the professionals is not much impressive. The contacts of the livestock extension professionals with livestock related agencies, flow of information and linkage with livestock related agencies was found to be not enough as per the requirements. The infrastructure facilities, medicines and vaccine availability were not found to be adequate. The core competencies that are crucial for the job of livestock professionals are not very effective. Though professionals understand the importance of having the competencies related to animal welfare, treatment, prevention, diversity, programme planning and evaluation but the knowledge and skill regarding the same are low. The middle level extension functionaries (Veterinarians) are having higher competencies than the lower level (Para-vets) due to well-known reasons of pre-service training, in-service training, more experience and understanding of the subject etc. The appropriate ways to acquire the core competencies in livestock extension professionals were recognized as good pre-service training, in-service training through various Animal husbandry departments, Veterinary colleges, ICAR institutes, Extension Education institutes etc. The current challenges in the livestock extension professionals can only be solved when there is better collaboration and coordination between the field, research labs and with other extension agencies. This will help in increasing the livestock service competencies, risk analysis competencies and programme planning competencies.

## Executive Summary

The study "Assessment of core competencies of livestock extension professionals" was undertaken in two districts of Kashmir Valley of Jammu and Kashmir namely Ganderbal and Srinagar. The data was collected from the middle level extension functionaries (Veterinarians/VAS) and field level extension functionaries (Para-vets) through personal interview of the respondents. The study was having two parts i.e., first part consisting of the information about the livestock extension departments and other about the assessment of core competencies. The competencies were based on identified eleven areas of the livestock extension profession and rated on their importance and the current level of knowledge and/or skills to perform each competency.

The contacts of the livestock extension professionals with the livestock extension related agencies were very low. The main contacts were with their own department of Animal Husbandry. The information flow through the livestock extension system was fair and mainly given on monthly basis. Infrastructure facilities in livestock extension departments were not adequate mainly there was inadequacy of audio-visual aids, internet facilities, technical literature etc. The linkages of the livestock extension professionals were mainly with line departments of the animal husbandry department and least with the research institutes, KVKs, NGOs and private vets. Livestock extension professionals were mainly aware about the breed improvement programmes and backyard poultry programmes. The knowledge about the latest programmes under the National Livestock Mission was very meager. There was negligible transfer of research findings from research institutes to the livestock extension professionals and yearly transfer of the extension material to the farmers. Giving information through mass media and ITC was not done by majority.

The livestock extension professionals considered most of competencies described as important but their current level of knowledge about most of these was not on par with the requirement of their job. The perceived importance of competencies was higher for the middle level extension functionaries (VAS) than the perception of lower level extension functionaries (Para-vets). The level of knowledge or skill of veterinarians was higher than the para-vets. Livestock extension professionals don't have required knowledge and skill to perform livestock extension related activities like surveys, campaigns, field trips etc. More in-service training is required by livestock extension professionals to be competent and updated regarding these competencies. The livestock service and welfare related competencies, subject related competencies and communication competencies were high among majority of livestock extension professionals (VAS). These are the main subjects of the exposure and practice during the pre-service training. Training in these areas is well understood and well applied by the Veterinary professionals. The risk analysis competencies and technical subject matter competencies of livestock extension professionals (VAS) were moderate. These competencies need to be upgraded through exposure of professionals to national and international standards by training them about benefits and need of the animals and animal product safety. There is need to sensitize about the importance of consulting recent research publications and training about the livestock business and entrepreneurship. The competencies of the para-vets were low regarding almost all eleven type of

the competencies. The para vets are having different education level and job profile but still need is to impart basic subject understanding of the veterinary field. Timely training and knowledge about the importance of welfare and risk analysis activities is important for the welfare of animals, humans and the food chain. There is an urgent need to provide knowledge and update para-vets regarding important core competencies according to their job, understanding and need. Pre-service training, in-service training through animal husbandry departments and veterinary colleges, international conferences, national workshops and constant sharing of the information between researchers and extension professionals were considered as the appropriate ways to acquire the core competencies.

### Core competencies

Competence is a concept that integrates knowledge, skills and attitudes, application of which enables the professional to perform effectively, and to respond to contingencies, change, and the unexpected RCVS, (2006), the ability to perform the roles and tasks required by one's job to the expected standard (Eraut and Boulay, 2000). Combination of knowledge, skills, and attitudes lead to competency, and they are the important traits that extension workers should possess. However, the need for competencies among extension workers is context-specific (Mulder, 2007; 2014). As the world is heading towards a new era, the world views of extension professionals are changing. Extension professionals in the new era demand more freedom in their work and decision making. In order to make meaningful contributions towards the profession, they perceive the need for yet higher levels of skills, knowledge, and abilities (Varner, 2011). Apart from agricultural extension, livestock extension is diverse, valuable and a relatively new operational concept in developing countries like India, and its role in veterinary and animal science research and development is not clearly understood by many (Sasidhar and Suvedi, 2016).

### Role of livestock in economy

In an agrarian country like India, agriculture forms the backbone of economy with 70 percent of the population engaged in agriculture in one way or other. The contribution of agriculture to the GDP (Gross Domestic Product) is 18 percent and animal husbandry forms an integral component of it. Animal husbandry plays an important role in country's agricultural economy as it supports livelihood of more than two-third of the rural population and contributes about 4 percent of the GDP and 26 percent of the agricultural GDP (AgGDP) from agriculture and allied sectors (Economic survey, 2016). Growth in livestock sector remained higher than the growth in crop sector and this provided a cushion to overall agricultural growth. Livestock sector plays a great role in food and nutritional security and acts as a best insurance to the farmers at times of crop failures. Despite its important contribution in national economy, this sector is facing many challenges like low productivity, prevalence of animal diseases, shortage of feed and fodder, inadequate infrastructure for marketing, processing and value addition, issues related to bio-security and sustainability, continuous decrease in indigenous or local genetic pool etc. (National Livestock Policy, 2013). The need of hour is to boom livestock farmers and help them to come out of the crises faced by them due to knowledge and technology gap and lack of effective linkages. The key role in this area is to be played by the veterinary extension departments by creating good and healthy linkages between scientists, new technologies, and the farmers.

### Livestock production in India

Livestock sector is expected to emerge as an engine of agricultural growth in view of rapid growth in demand for animal food products. Livestock is important in supporting the livelihoods of poor

farmers, consumers, traders and laborers throughout the developing world (FAO, 2002). India's livestock sector is one of the largest in the world with 56.7 percent of world's buffaloes, 12.5 percent cattle, 20.4 percent small ruminants, 2.4 percent camel, 1.4 percent equine, 1.5 percent pigs and 3.1 percent poultry. The distribution of livestock is far more equitable than of landholding (Livestock Census, 2012). Milk production in India rose from 155 million tons in 2015-16 to 164 million tons in 2017-17, a rise of 6 percent. But the Government has an ambitious target of achieving 300 million tons milk productivity by year 2024 - a key matrix in doubling farmer income by 2022. But the main concern will remain to be maintenance of cattle in India to deliver that productivity and knowledge and resources of farmers to deal with this challenge (Economic Times, Dec-9, 2017). Livestock are not utilized to their full potential due to constraints faced by farmers in terms of feeding, breeding, health management, and lack of proper knowledge about livestock rearing, managing risks, market facilities, health services etc. (Planning Commission, 2012). The rising population, income growth and urbanization are fueling the radical changes in dietary patterns in favor of livestock food products. On one hand there is continuous increasing demand for animal proteins and on other hand livestock farming is under pressure and facing lot of global challenges. These challenges have to be addressed so as to make the animal production sustainable for the future (Farm letter, 2016). The developments in livestock sector can help in changing the face of rural India as it is demand driven, inclusive and pro-poor. It is also seen that the states with more livestock farming share are facing less poverty (Planning commission, 2011-2017). With increase in population, improved livelihood and changing lifestyle demand for livestock service delivery is also increasing. Among various services, an effective and efficient animal health care service delivery system is of paramount importance. The animal health service delivery system area in developing countries is still dominated and run by public sector governments.

The animal health flagship programme of the CGIAR Research Programme on Livestock has identified delivery of health services as a key priority. The International Livestock Research Institute (ILRI), which leads the programme, has partnered with TechnoServe's Innovation in Outcome Measurement (IOM) project to pilot a case study that will test innovative service delivery approaches in extensive livestock production systems (Kiara et al., 2017). The demand for information on livestock production is growing, both in the sense of demands expressed by the producers themselves, and in more general sense of a growing potential for increasing production through the delivery of information and latest technologies. Extension delivery system is aimed at helping management to achieve a congruent fit between the environmental conditions, organizational tasks, staffing and the organizational structure adopted. Therefore, efficient and effective animal health services cannot be provided solely by developing technologies for the control of animal disease; it is also necessary to effectively organize the delivery of this technology (Liesse, 1991).

## **Scenario of livestock extension system in India**

Livestock extension is an important tool in achieving changes in animal production. This system has been created and recreated, adopted and developed over the centuries for the dissemination and

application of research results in order to improve animal production and health, including food safety (Khoury, 2011). India's huge livestock resources are poorest in the world when it comes to productivity because this sector has remained under-invested and neglected by the financial and extension institutions (Chander et. al., 2010). The prevalence of the various production, infectious, and zoonotic disease has severely affected the production, farmers, and economy of the country. In spite of the fact that animal health extension gets more preference than the production extension, there is limited diagnostic infrastructure available in India and where available they are not delivered to the end users in an effective way (Planning commission, 2012; Singh et al, 2013). Livestock diseases are potentially catastrophic type of agricultural risk. The disease situation is complicated by several factors like large population of susceptible animals, no systematic vaccination, and unrestricted movement of animals within the country (Basic Animal Husbandry Statistic, 2010-11). Most of the livestock producers being small and marginal farmers, their capacity to mobilize resources required to absorb the latest technologies developed by research institutions are limited. Absence of an effective extension machinery for this purpose compounds the problem. Lack of access to institutional finance is a major constraint in attracting investment required for improving productivity by adopting latest technology (National Livestock Policy, 2013). Veterinary extension is usually not independent. It is headed by non-veterinarians and separate from Veterinary Services. This makes veterinary extension appear to be a secondary activity of agricultural extension. This situation makes Veterinary Services unable to plan and execute their own extension programmes. Veterinary Services focus on controlling animal disease programmes (vaccination programmes, diagnosis of diseases and veterinary quarantine, amongst others), without giving veterinary extension the attention it requires (Khoury, 2011). The livestock sector receives only about 12% of total public expenditure on agriculture and allied sectors thus remains grossly neglected. The extension format, methodology and setup established for agriculture had failed to serve the needs of livestock sector. Only 5% of farm households in India have access to information on livestock against 40.4% for crop farming (Planning commission, 12th Five Year Plan).

The livestock extension education related activities and the professional competencies don't meet the needs and requirements of the vast majority of farmers. To add to this problem there is the huge neglect of the policy makers and the researchers towards the livestock extension (Mortan and Matthewman, 1996). There is absence of effective livestock extension services, in addition to the absence of well-defined programmes to guide and support animal production and health programmes designed for the control of animal disease and improvement of food safety standards (Khoury, 2011). In majority of the developing countries the public sector plays an important role in delivery of free extension services along with the subsidies. Extension in today's Indian context includes the agencies in private, public, NGO's, and community based initiatives that provide range of Agricultural activities (Sulaiman, 2012). But there is hardly any private sector investment in Animal Husbandry, except in the dairy sector that has attracted considerable private investment (Planning Commission, 2012).

## Challenges in effective livestock extension services

There is increasing evidence that improving access by poor farmers to animal-health services will improve their livelihoods. Analysis of means to bring about development in rural areas over the last two decades has seen a gradual trend toward direct involvement of farmers in the process. Farmer participation is an essential ingredient to the development process (FAO, 2002). Smallholders need much more pro-active services and support system than large farms since the latter can prosper when the basic enabling environment is in place, as they can secure critical services for themselves. There is a whole range of services that are needed to enhance the capacity of livestock producers to exploit the full potential of livestock production. These include health and production services and other market services such as credit, livestock insurance, delivery of market information and output marketing, capacity building for farmers' organization, and asset accumulation of farmers (Ahuja and Redmond, 2004). The major constraint faced in livestock breeding service delivery are unavailability of the information booklets, unawareness about extension activities and lack of training programmes (Rathod et.al., 2012).

In developing countries where the farm sector comprises a large number of relatively small farmers, the clients of extension services live in geographically dispersed communities, the transport links are often of low quality, incidence of illiteracy and the limited connections to electronic mass media further limits the ability to reach clients. Thus, the number of clients that need to be covered by extension is large, and the cost of reaching them is high. The challenge is complicated further by the fact that farmers information needs vary even within a given geographical area due to variations in climate and the adaptability of the livestock species. The large size of clientele inevitably leads to a situation where only a limited number of farmers have direct interaction with extension agents (Axinn, 1988; Feder and Slade, 1993). The weak veterinary extension is also caused by the insufficient number of veterinarians working in the region and their limited practical experience in interacting effectively with animal producers, especially women, in order to tackle animal health issues and nutrition related diseases more generally (Khoury, 2011). Veterinary and animal science services are highly specialized and need qualified technical manpower. There is a huge gap between the availability and requirement of major stake holders in livestock extension like less student intake and out turn from the state veterinary colleges, less number of faculty in veterinary colleges, less availability of the field veterinarians and Para veterinarians (Rao et. al., 2015). Only 34,500 field veterinarians, 3050 veterinary scientists and 52,000 Para-vets and supporting staff are employed for field services against the requirement of 67,000, 7500 and 2,59,000 respectively with poor, inadequate veterinary infrastructure (National livestock policy, 2013). Along with the insufficient veterinary professionals the factors severing the problem are the poor collaborative extension – research linkages (Balaguru and Rajagopalan 1986; Eponou, 1993; Rao et al., 2015 inadequate extension services and poor communication (and utilization) of livestock research findings and inadequate competencies among livestock extension professionals (Matthewman and Ashley, 1996; Delgado et al., 1999; Ahuja et al., 2000; Chander et al., 2010; Hegde, 2010).

## Need to access core competencies in livestock extension professionals

Extension Committee on Organization and Policy (ECOP, 2002) stated, "If extension is to thrive, it must understand and adjust to rapid changes and emerging challenges". Extension organizations in many developing countries including India have tough time to adapt to changing environments that are mainly attributed to deteriorating extension human capital (Ghimire, 2016). The livestock extension services are meager than their requirement for improving effectiveness in the supply and diffusion of agricultural technologies, changing institutional structures, and increasing collaboration and cooperation between the public and private sectors (OECD, 2012). Most of Extension professionals had traditional schooling, and have an understanding of social mobilization and the participatory programme development process. There is need for a paradigm shift in developing countries' extension services from a technology transfer to a process-skills orientation; from being extension agent-led to farmer-oriented and farmer-led; and from top-town to bottom-up (Suvedi and Kaplowitz, 2016). Extension professionals should be examining issues within broader contexts and take their underlying components into account, rather than looking at issues objectively. The world is changing fast and having knowledge and resources are not all that matters; rather what matters most is how such knowledge and resources are utilized. Skills, abilities, and attitudes are more pivotal in performing the job effectively (Hay Group, 2003; McClelland, 1973). Competency-based human resource management is gaining ground in various service sectors, including extension services. The literature shows that most of the competency-based studies on extension have been conducted in the U.S., with a very few being based in Asia and Africa (Ghimire, 2016). Extension workers are now considered not only the channels for information transfer but also the facilitators, advisors, consultants, and sources for innovation and knowledge. To succeed in their work, extension professionals should know who their clientele is, work with their clientele to identify its needs, develop programmes that the clientele demand; implement and evaluate programmes, and at the same time, engage in co-learning with clients (Rajalahti, 2012). Identifying core competencies needed by agricultural extension professionals is crucial for planning their training and education programmes. Core competency needs are contextual. Extension management should know the essential competency domains their extension professionals require, which lay the foundation for an analysis on competency, identifying gaps in competencies and determining areas for training and education. In this backdrop, the current study was taken up with the following objectives:

1. To understand the scenario of livestock extension system, its organization, regulation and operation in Kashmir valley.
2. To access the core competencies of the livestock extension professionals of the Kashmir valley.

### Locale of the study

The present study was conducted in the two districts of the central Kashmir i.e., Srinagar and Ganderbal. Srinagar is situated at the center of the Kashmir valley and is the second most populous district in the Indian state of Jammu and Kashmir, after Jammu District and is home to the summer capital (Srinagar) of Jammu and Kashmir. It is located at 34°05′N and 74°50′E. According to the 2011 census, Srinagar district has a human population of 1,269,751, and livestock population of 2.279 lakh (1.421% of total livestock population of J&K). The geographical area of the Srinagar is 141 km<sup>2</sup> (54 sq miles). Ganderbal is the newly formed district of the state of Jammu and Kashmir of India, earlier it was part of Srinagar. It is located at 34.14°N and 74.47°E at an average elevation of 1,950 metres (6,400 ft) above sea level and at a distance of 21 kilometres from Srinagar city. Ganderbal district is spread across the Sind River which is considered as the lifeline of the district. Ganderbal has human population of 297,003 and livestock population of 4.044 lakh (2.521% of total livestock population of J&K).

### Sampling plan

From each of the two districts 30 livestock extension professionals were selected randomly for the study (15 Field veterinarians and 15 Para vets), making a total of 60 respondents. Respondents were interviewed at their respective places of posting based on various parameters of the study.

The two districts selected for study are central and nearest to the main centre of the state, presence of Central Animal Husbandry Department and Veterinary Research Institute in these two districts was presumed to be useful in easy reach out to the different field level extension workers in an effective way to obtain more reliable data.

### Scenario of livestock extension organization in Kashmir

The main organizations engaged in the livestock extension related work in the study area are the state department of Animal Husbandry, Krishi Vigyan Kendras (KVK), Veterinary research institutes (SKUAST-Kashmir).

#### 1. General information about the livestock extension professionals

The respondents of the study were mainly middle level and lower level extension functionaries i.e., Veterinarians and para-veterinarians each constitute the sample size of 30, 15 from each of the district. The majority of the field level extension functionaries were in middle age group of 35-49 years (45%). This can prove a great asset for the extension work as this age group is having both enthusiasm of the young and experience of the old. People in this age group are generally more eager to serve the society in the best way and are more empathic towards their community. The proportion of the female extension workers was found to be very low (6.66%). This low percentage of female professionals in the field can be attributed to the fact that majority of the females prefer to work in offices and are less motivated for the field level work.

**Table 1: Socio-economic parameters of the respondents**

	Category	Frequency	Percentage
Age	20-34	22	36.67
	35-49	27	45.00
	40-60	11	18.33
Gender	Male	56	93.33
	Female	4	6.66
Service years	1-10	25	41.67
	11-20	21	35.00
	21-30	9	15.00
	31-40	5	8.33
Qualification	10th	11	18.33
	12th	5	8.33
	BSc.	8	13.33
	MSc.	5	8.33
	BVSc.	16	26.67
	MVSc.	13	21.67
	PhD	2	3.33

Majority (50%) of the middle level extension functionaries (veterinarians) were Bachelor of Veterinary Sciences (B.V.Sc) that is the minimum qualification for the post of veterinary assistant surgeons. 43.33 percent and 6.67 percent were having Masters and Doctorate degree in veterinary sciences. Good number of the professionals were having the expertise (Maters) in some of the veterinary subjects that can be taken as a positive point towards the delivery of efficient services and more understanding of the field level livestock problems.

Majority (36.66%) of para-vets (mostly senior ones) were having qualification up to 10th class which is the minimum qualification for the job of para-vet followed by the 26.67 percent with BSc level qualification and 3.33 percent with MSc. It was seen that the young para-vets who were also newly recruited are having higher qualifications above the 12th level. No para-vet in recent few years of the recruitment was having qualification less than BSc. The new generation of both low and middle level extension professionals are coming with high level of knowledge and therefore more useful in delivery of efficient services.

## 2. Contact with the other extension service providing extension agencies

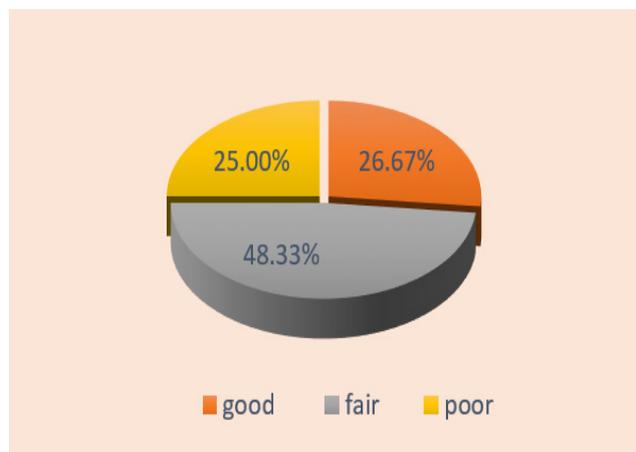


**Fig 1:** Contacts of livestock extension professionals with livestock extension.

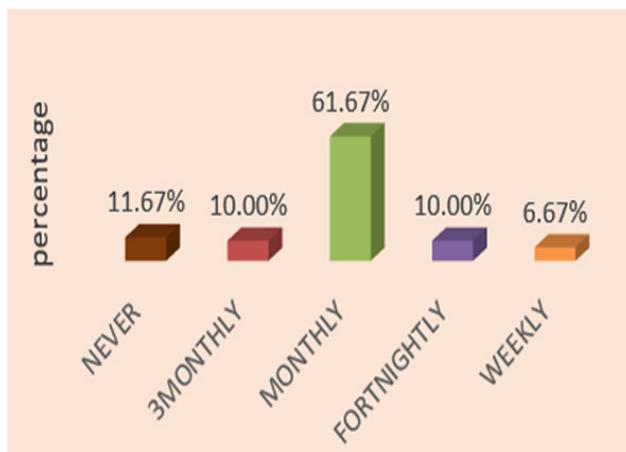
The study revealed that the extension contacts of the professionals were very low. The highest contact were with the state animal husbandry department (98.33%) because it was the main agency to which the majority of livestock extension professionals are concerned with. It was followed by research institutes (30%) to whom sometimes farmers are referred for doing the diagnostic tests of some complex pathological conditions, etc. and also model trainings are organized for field extension agencies by these research institutes. There are very less contact of the extension professionals with other extension related agencies like private vets (18.33%) who are very few in the state, EDI (15%) and NGOs (6.67%) that can be a reason for less sharing of the knowledge and can be a reason for less

know how of the farmers about these agencies. The least contact with the NGOs may be attributed to least presence of such agencies related to animal husbandry at the ground level.

### 3. Information flow through the Animal Husbandry department



**Fig 2 (a):** Diagrammatic representation of the information flow efficiency through veterinary departments.



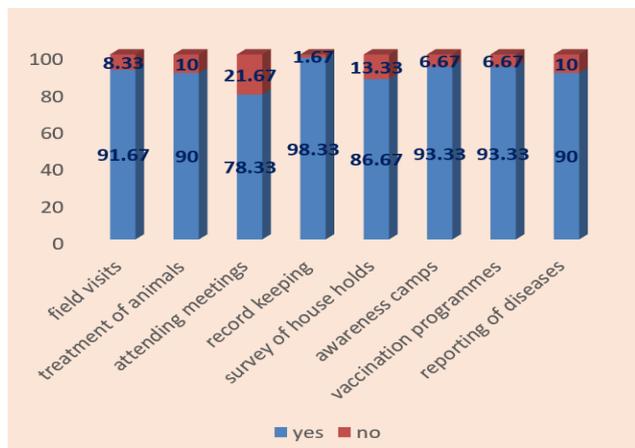
**Fig 2 (b):** Diagrammatic representation of the frequency of the information flow through livestock extension departments.

The results in the fig 2(a) shows that majority of the respondents (48.33%) perceived information flow through the livestock departments as fair followed by 26.67 percent and 25 percent who perceived it to be good and poor respectively. Majority of respondents (61.67%) said that there is monthly flow of the information from the ground departments (district livestock hospitals and village level dispensaries) to the higher ones (central and block veterinary offices) and vice versa. There are regular monthly meetings of the field veterinarians at the district headquarters where the reports and monthly information is shared with the officials. A low majority of 11.67 percent respondents revealed that there is no information flow through the extension departments. The reason for the less frequent information flow can be due to the absence of the proper procedure to update information from professionals working in far flung areas especially from the para-vets. The majority of para-vets are not able to transfer updated information to higher departments. Monthly meetings at district headquarters are mostly held in between the veterinarians and for para-vets there is no such formal procedure for continuous information channel that results in the break in efficient flow of the information.

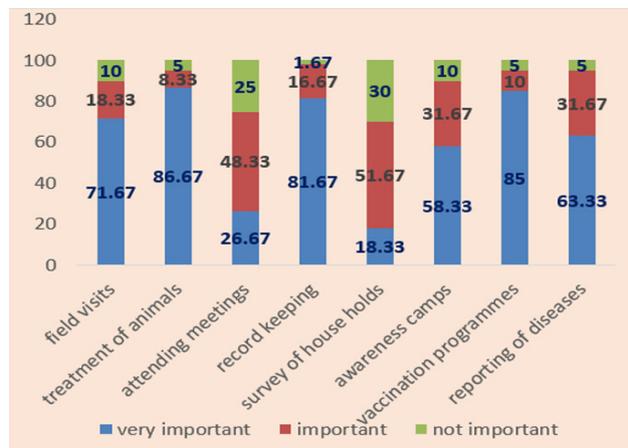
### 4. Monthly activities of livestock extension departments

Most essential activities of the livestock extension professionals are field visits, treatment of animals, attending meetings, record keeping, survey of households, awareness camps, vaccination programmes, and reporting of diseases. Sometimes one activity overpowers the other depending upon the situation and the location of the area and job. Among all, treatment of the animals and field visits are the major domain of the livestock extension professionals as main aim of livestock

rearing is to improve productivity of animals and that is possible only when they are in a good health condition. The animals once treated on timely basis in an efficient way can improve the credibility and fidelity of the extension professionals.

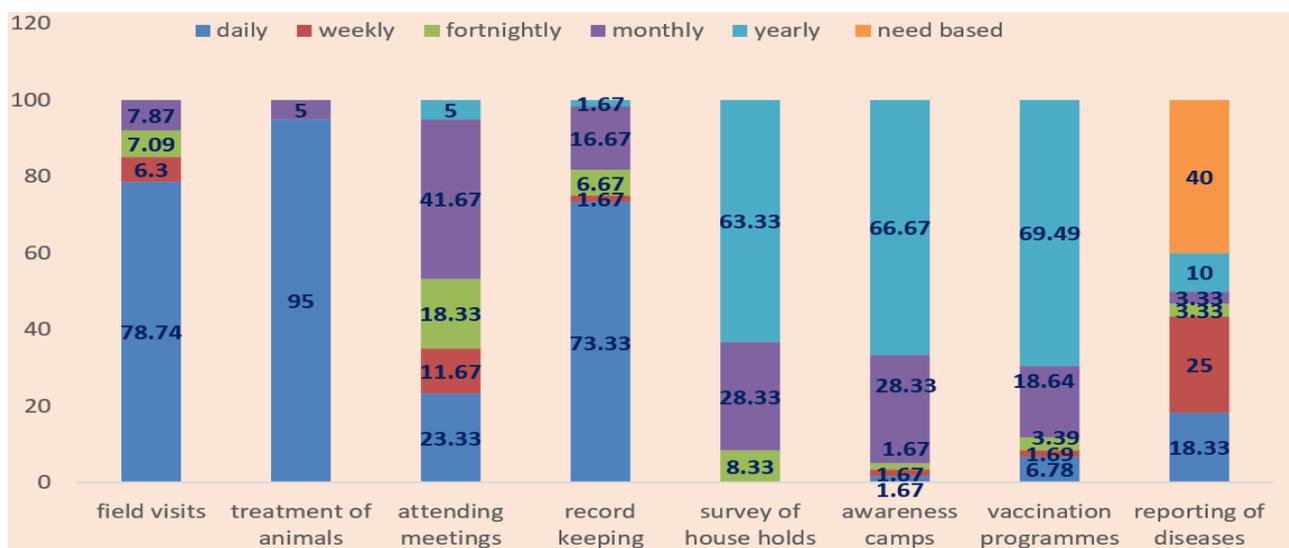


**Fig 3 (a):** Activities that come under the job profile of livestock extension professionals.



**Fig 3 (b):** Preferences given by livestock extension professionals to different monthly activities.

The results in Fig. 3(c) indicates that majority of the professionals does field visits, treatment of animals, and record keeping on daily basis while survey of households, awareness camps and vaccination programmes were done on yearly basis by majority. Reporting of disease outbreaks was done by majority on the basis of need or whenever disease outbreak occurs. The outbreaks are mainly reported to the Institute of Animal Health and Biological Production, Zakura, Kashmir. This division undertakes investigations, incidence of various livestock and poultry diseases that are referred to the institute. Whenever the outbreaks are reported to the disease investigation section, such outbreaks are thoroughly investigated. Meetings were attended by respondents (41.67%) on monthly basis as the meeting are generally conducted in the Animal Husbandry departments at block levels. In

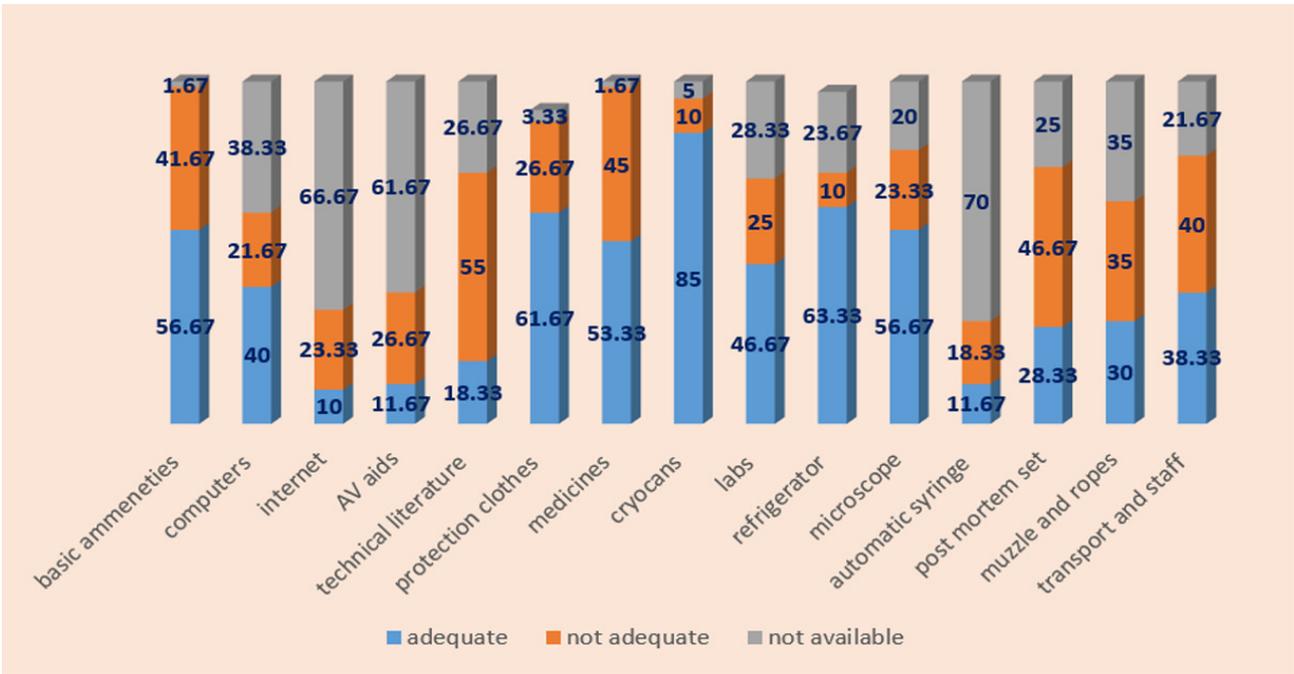


**Fig 3 (c):** Frequency of performing monthly activities by livestock extension professionals

these meetings the monthly progress, and the challenges are discussed with the higher officials. The vaccinations are mainly done in preferred season once a year to the animals. The vaccinations are mainly provided for the FMD and black quarter diseases from the veterinary centers to the livestock farmers. The vaccination production division of Institute of Animal Health and Biological Production, Zakura, Kashmir is meant for production of various veterinary biologicals against diseases like HS (Haemorrhagic Septicemia), BQ (Black Quarter), Anthrax for animals in quantities sufficient for the valley.

The proper and timely immunization of the livestock against black quarter HS, FMD (Foot and Mouth Disease), Anthrax, RD (Ranikhet disease), IBD (Infectious Bursal disease) and fowl cholera that used to occur and take heavy toll of livestock and poultry previously have been considerably minimized but still pose a major threat to the livestock and poultry Industry. The frequency of the awareness camps is low as they are done on the yearly basis. The awareness camps should be conducted frequently to disseminate knowledge to farmers about animal management, feed and fodder management, and about the zoonotic diseases that seems to be less among the farmers of Kashmir. The monthly meetings are conducted mainly for the veterinarians and very least meetings are conducted for the para-vets.

**5. Availability of various infrastructure facilities in veterinary centers**



**Fig 4:** Availability of various infrastructure facilities in Veterinary Centres

The extension professionals reported that there is adequate availability of the basic amenities like table, chairs, stationary and electric fans in their respective veterinary centers. Fig 4 shows that only 40 percent of the respondents have the adequate presence of the computers in their offices that indicate reports or the record keeping is still done manually in these departments. The majority

of the respondents (66.67%) do not have availability of the internet facilities. This can show the condition of the state regarding the provision of the information through ICTs. Lack of internet facilities to the livestock professionals makes them helpless to share daily updated information to the farmers. A majority (61.67 %) of the respondents don't have audio-visual aids. Audiovisual aids are main equipment's for any extension profession for the dissemination of information, conducting trainings in campaigns, surveys and the exhibitions. The unavailability of such equipment renders these programmes less effective and less attractive to the people. The majority of the professionals reported there is inadequate availability of the technical literature that otherwise is a powerful tool for giving information to the people. There is not adequate supply of the medicines to the veterinary centers and if available it is not of good quality that makes it ineffective on the animals and farmers have to purchase medicines from outside markets.

Veterinarians have to work with the livestock hence are susceptible to many health hazards during their work. There has to be adequate supply of protection cloths, gloves, masks and automatic syringes that to some extent can prevent the transfer of the communicable and zoonotic diseases. The majority of the respondents reported the availability of the protection cloths like aprons, gumboots, gloves etc. to them. The results are similar to the findings of Channappagouda and Sasidhar (2017). The veterinary centers of the state are in the drastic condition with majority facing inadequacy of necessary equipment, lab facilities, microscopes, autoclaves, etc. Livestock extension professionals work to their best potential in minimum possible facilities. Non-availability of necessary facilities and equipment renders them handicapped and unable to give best performance in the field. The unavailability of the physical facilities are proving demotivating agents to extension professionals. There is an urgent need to fill the gap between the availability and actual requirement of these facilities in livestock health centers for efficient delivery of livestock health services.



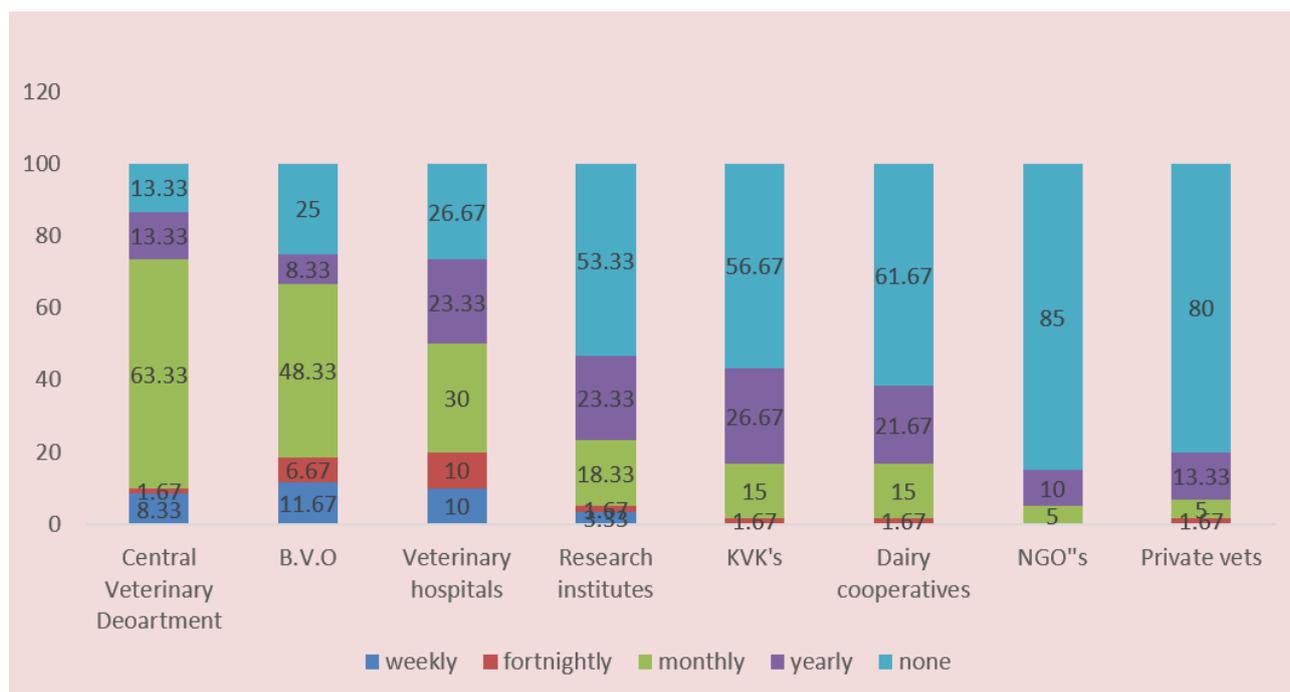
**Fig 5 (a):** Linkage type of extension professionals with livestock related agencies and organizations

## 6. Linkage of livestock extension professionals with livestock related agencies and organizations

The linkages of the livestock extension professional with the livestock extension agencies are not very impressive. Majority of livestock extension professionals have functional type of linkage with the central veterinary hospitals, block veterinary offices and veterinary hospitals while as 53.33 percent, 56.67 percent, 61.67 percent, 85 percent and 80 percent were not having any linkage with research institutes, KVK's, dairy cooperatives, NGO's and private vets respectively Fig 5 (a).

Majority of livestock extension professionals are not frequent in linkages with extension agencies as shown in fig 5 (b). The linkage with the central veterinary hospitals, Block Veterinary offices and Veterinary hospitals are mostly on monthly basis. This may be to attend the monthly routine meetings. The frequency of linkage with the research institutes is very poor as compared to the required need. The field veterinarians are not having good linkages with the research institutes that are main centers where the technology generation starts. This renders the field veterinarians unaware about the recent research happenings and the researchers unaware about the actual field problems.

The linkage with KVKs is also poor. More than 50 percent are not having any type of linkage with KVKs. KVKs are the main centers for the vocational trainings, first line extension institutes, working with the weaker sections of the society. But KVKs and the field veterinarians are not having continuous interactions due to different mandates of the both. The livestock extension professionals are mainly engaged in the treatment aspect have very less part in providing vocational trainings and providing farmer advisory services. But the aim of both professionals is same development of the people so both should work together in order to share their experiences and find effective solutions to the problems of farmers. The presence of NGO's for livestock related services is very meager in the valley.



**Fig 5 (b):** Frequency of the linkage with livestock related agencies and organizations

The growth of NGOs in this sector is still in its infancy stage. The huge majority having no linkage with the NGO's show the less presence of such agencies at the ground level. Missing links between interdependent tasks have a negative influence on the whole process of technology generation and delivery. Links are missing when two or more tasks that should be coordinated are not. The most obvious cases of missing links are those where researchers and technology-transfer workers are ignorant of each other's activities (Robin Bourgeois, 1990).

The presence of the private veterinarians is meager in state of Jammu and Kashmir due to lack of the tradition of having pets like dogs and cats. As the rearing of dogs has the religious taboo so majority avoid it. Nowadays the people have started keeping pets and there is emergence of the pet clinics but that too is restricted to the urban areas only. Livestock owners are mostly resource poor and economically backward who cannot afford private veterinarians that makes the scope of the same very less in the valley.

Regarding linkages between the research and extension Kassa and Alemu (2017) in their finding stated that research-extension linkage are generally weak because neither research nor extension is sufficiently conscious of the need to understand the constraints and potentials of different farming systems as a basis for determining relevant technology and technology-development requirements.

## **7. Livestock developmental programmes going in the Animal husbandry departments**

Some of the main livestock developmental programmes going in animal husbandry departments are farmer advisory programmes that are going routinely in the department to impart necessary information to the famers regarding livestock rearing. Fodder development programmes are also going and mainly KVKs are doing these programmes actively in downtrodden areas. The farmers are provided knowledge about the silage making, value adding of the low grade fodder to convert it into fodder of good grade. It was also proposed by Government of Jammu and Kashmir in State livestock mission to organize base-line survey and feasibility studies in different parts (District, sub-Division, or a cluster of district) to determine status of fodder/livestock production, potential and demand, and tailor assistance accordingly. The breed improvement programme is main and most important programme going in the livestock departments. There is appreciable coverage of the livestock with artificial insemination with the high quality bulls. The semen straws are prepared at livestock development board located at Ranbir Bagh, Ganderbal from where high quality semen is distributed to whole Kashmir. The farmers are provided semen straws at subsidized rates of 30 rupees only. By this way it becomes affordable for the poor farmers to artificially inseminate their animals with high quality semen. Genetic upgradation of livestock with exotic germplasm is very much needed for increasing the production and to meet the growing demand of the livestock products. Frozen Semen Technology being the main tool to achieve it in cattle. Presently 1287 frozen semen centres are functioning in state where artificial Insemination of local non descriptive cows and buffaloes is carried on (Integrated Sample Survey 2011-2012). The vaccination and the de-worming programmes are also going routinely in the departments. The main diseases against which farmers are given

vaccines on subsidized rates are foot and mouth disease (FMD), black quarter (BQ) and hemorrhagic septicemia (HS). But the main disease that effects livestock in the valley is the FMD and becomes reason for the death and loss of livestock. Instead of the availability of the vaccines at the animal husbandry centers there are still cases of the livestock affected with this disease that may be due to the reluctance of the owners to do vaccination of the animals or less out reach of the extension professionals to the farmers or vaccination failures. All these problems need to be addressed by increasing the frequency of the awareness programmes to farmers and by proper monitoring of the programme implementation at the ground levels by higher authorities.

Another important centrally sponsored scheme going in the animal husbandry department is rural backyard poultry scheme. The below poverty line (BPL) families are provided low input technology birds of good growth rate and production value and grow on kitchen wastes . This programme is going on in KVKs and research institutes. The farmers are provided with chicks for backyard rearing mainly Vanraja at the subsidized rates from the animal husbandry departments. These birds does not require any specialized feed and can thrive well on the kitchen garden waste. The KVK Ganderbal is also running a programme for integrated backyard poultry-horticulture rearing as the Kashmir part of Jammu and Kashmir is well developed in horticulture.

There is big gap between the demand and supply of livestock products in Kashmir. There is urgent need to increase the quantum of livestock to meet the current increasing demand for livestock products adopting new livestock production and improvement programmes. There are various programmes going under the National livestock mission in Kashmir and part of centrally sponsored programmes like National programme for dairy development, National mission on protein supplements, Dairy entrepreneurship development scheme (DEDS), Integrated development of Small ruminants and rabbits (IDSRR) but the livestock extension professionals are having meager knowledge about such programmes.

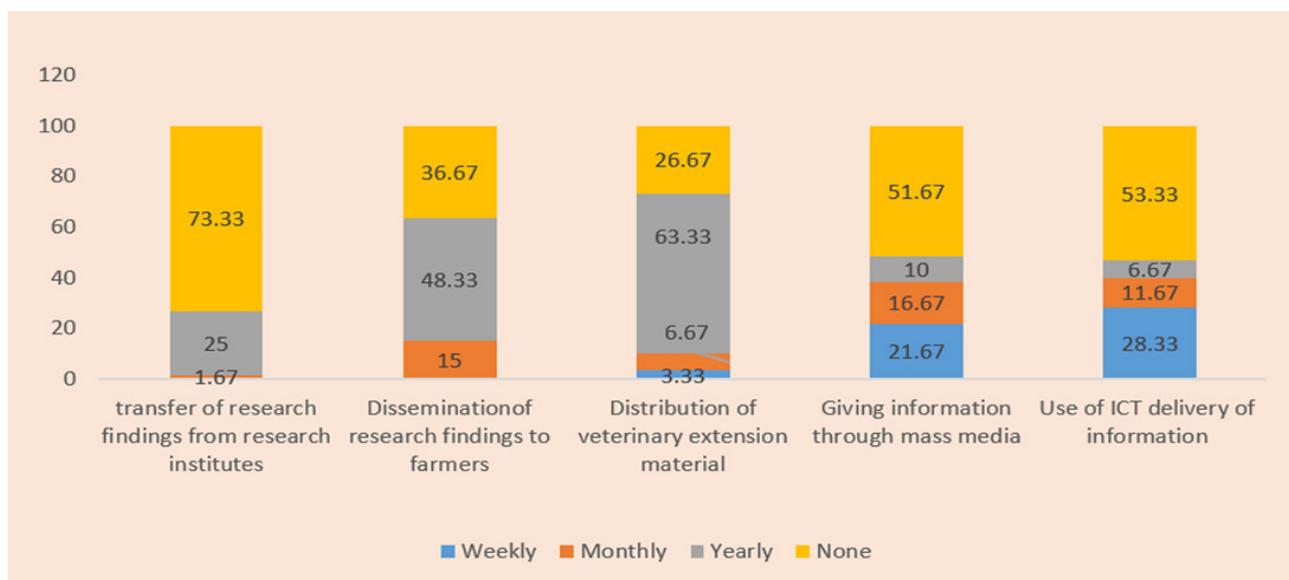
## **8. Information related to dissemination of information and technology**

The results in Fig. 6 depict the status about dissemination of information and technology to the livestock farmers through extension professionals. Majority of the respondents (73.33%) reported that there is no transfer of the research findings from the research institutes to the field level livestock extension functionaries. The dissemination of the research findings to the farmers and distribution of livestock extension material by the field level extension professionals is done mainly on yearly basis. More than half of the extension professionals reported that there is no dissemination of the information through ICTs as there is lack of such facilities like having smart phones etc. among farmers.

The distribution of the extension material and sharing of the new findings or awareness about some important issues to farmers is mainly done when there is Kissan meal's or farmer fares and in awareness camps. This type of programmes are mainly conducted once a year by the animal

husbandry departments. The use of mass media for information is mainly done through publicity wing of the animal husbandry department and the ground level professionals and para- professionals are not directly involved in these activities. The radio talks or the TV talks are mostly given by some senior officials mainly. Use of ICT is still in infancy in the valley though the many efforts are given by the KVK's, block veterinary officers (BVO's) and central veterinary officers to start the delivery of the information to farmers through SMS, WhatsApp and social media sites.

Suvedi et al. (2015) reported that as the contexts are changing, competition for resources is increasing, clients are more aware of their need for services than before, and they are demanding quality, reliable and performance-based services. So the need to strengthen dissemination of information and technology becomes foremost important.



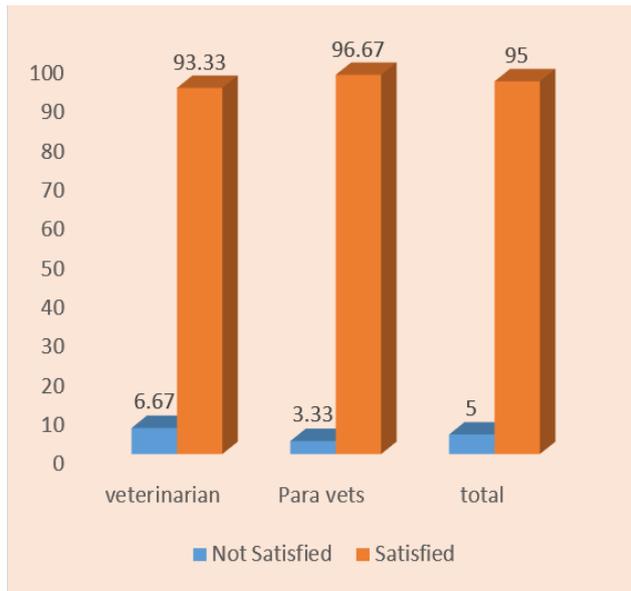
**Fig 6:** Information related to dissemination of Information and technology

### 9. Job satisfaction of the livestock extension professionals

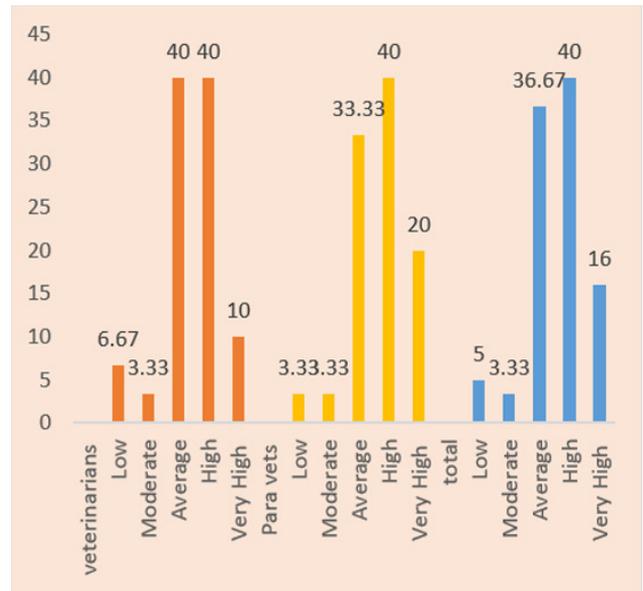
Majority of the livestock extension professionals are satisfied with their current job. The level of the job satisfaction as shown in Fig. 7(b) is high among the majority of the professionals. The results are in contradiction to the study of Adisa (2015) on his relevant study on competencies of livestock extension professionals in which professionals were found to have low to very low level of job satisfaction.

The state of Jammu and Kashmir has the least presence of the private sector jobs and getting a government job is like luxury in the state. More ever there has been no job creation in the departments of Animal husbandry from decades. The present veterinarians knowing the condition of the sector are very much satisfied of having a high profile job in a state of highly unemployed educated youth. Nearly thousand highly qualified veterinarians are not getting any job and some has reached the age limit even after having the doctorate degrees. The other reason for the job satisfaction is the feeling

in veterinarians that they are serving the ones who can't speak about their diseases and this gives an intrinsic motivation to do the job.



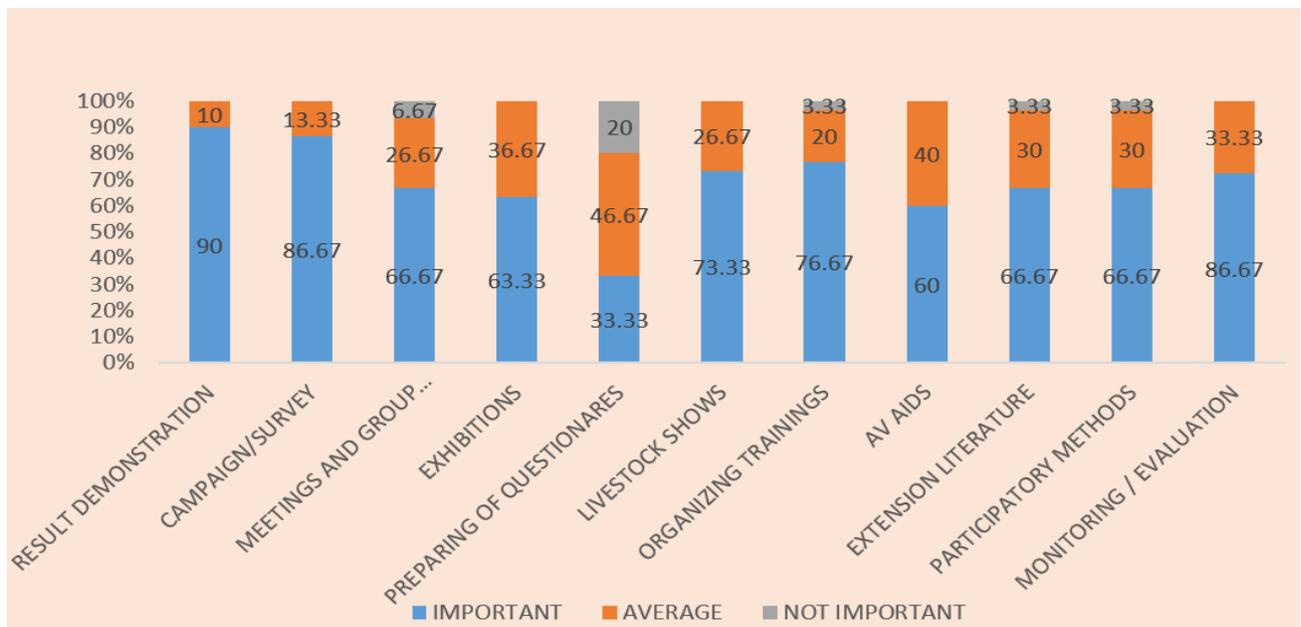
**Fig 7 (a):** Job satisfaction



**Fig 7 (b):** Level of job satisfaction of livestock extension professionals

## Core competencies

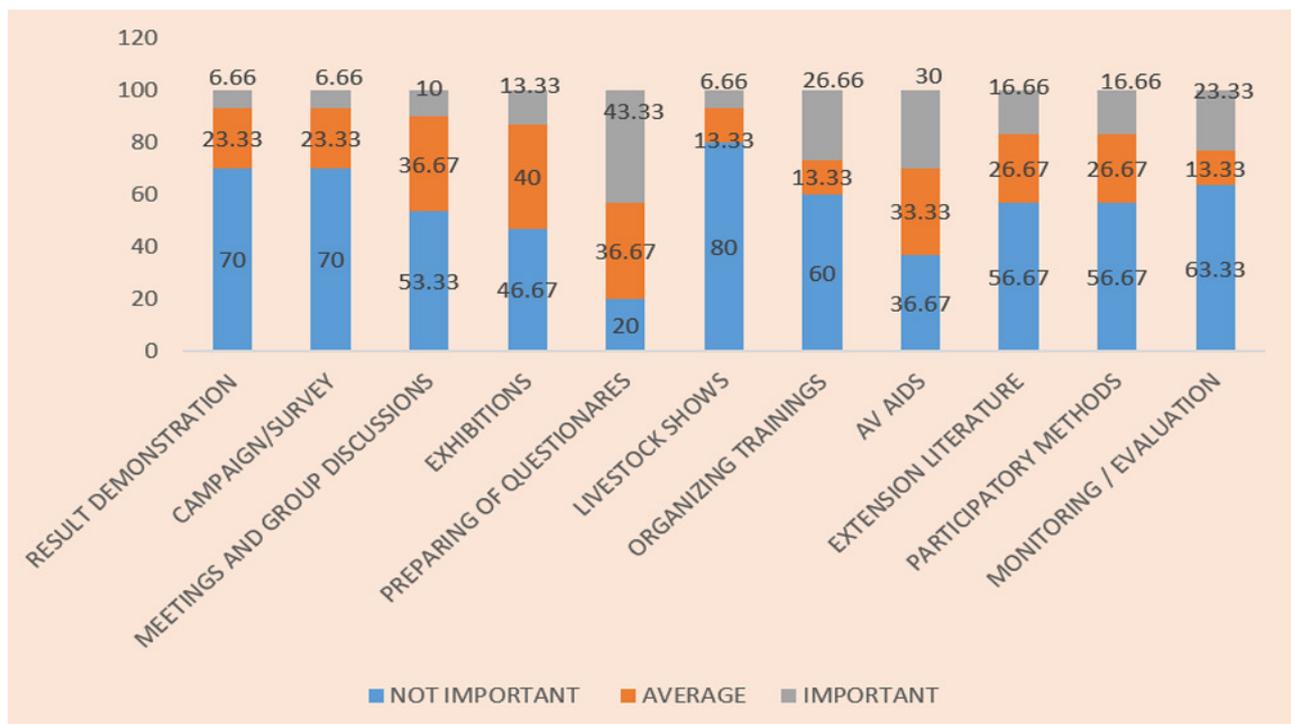
### 1. Livestock Extension Related competencies



**Fig 8 (a):** Importance of livestock extension related competencies (veterinarians)

The results in Fig. 8(a) shows that knowledge level of professionals about the extension related competencies were lower as compared to perceived importance of the same. Most of extension

competencies were considered important by majority of veterinarians except the preparation of the questioners. Result demonstration, campaign/survey and monitoring and evaluation were considered to be more important by huge majority of veterinarians compared to the meetings, exhibitions, audio visual aids, extension literature and participatory methods that were considered important by around 60-66% of veterinarians. Martin and Sajilan (1988) in their study on competencies of the extension professionals found that method demonstration, developing personal relationships with clients, interpreting the impacts of change, etc., were found to be most important competencies possessed by the extension professionals.

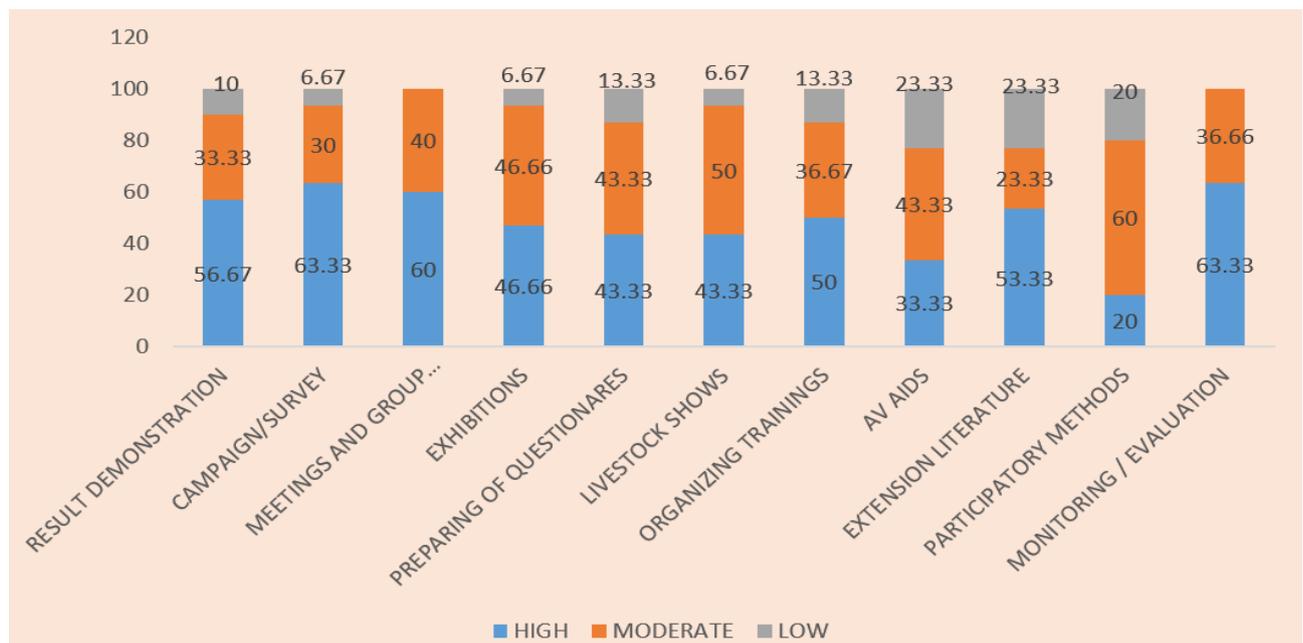


**Fig 8 (b):** importance of livestock extension related competencies (Para-vets)

The low importance for preparing survey questioners was due to least use of questioners on routine basis and if used in surveys they are prepared by the separate professionals in the higher veterinary offices and field level extension workers are negligibly exposed to make the questioners. Result demonstration and campaign are considered highly important because they are having a direct, immediate and purposeful effect on the farmers and are important methods to bring change and disseminate the technology. The monitoring and evaluation was considered important from the view point of formulating new programmes and policies and find out the loop holes in the earlier or ongoing ones. The audio visual aids, extension literature and participatory methods were considered less important because there is not adequate availability and expertise of the field level extension professionals regarding these areas.

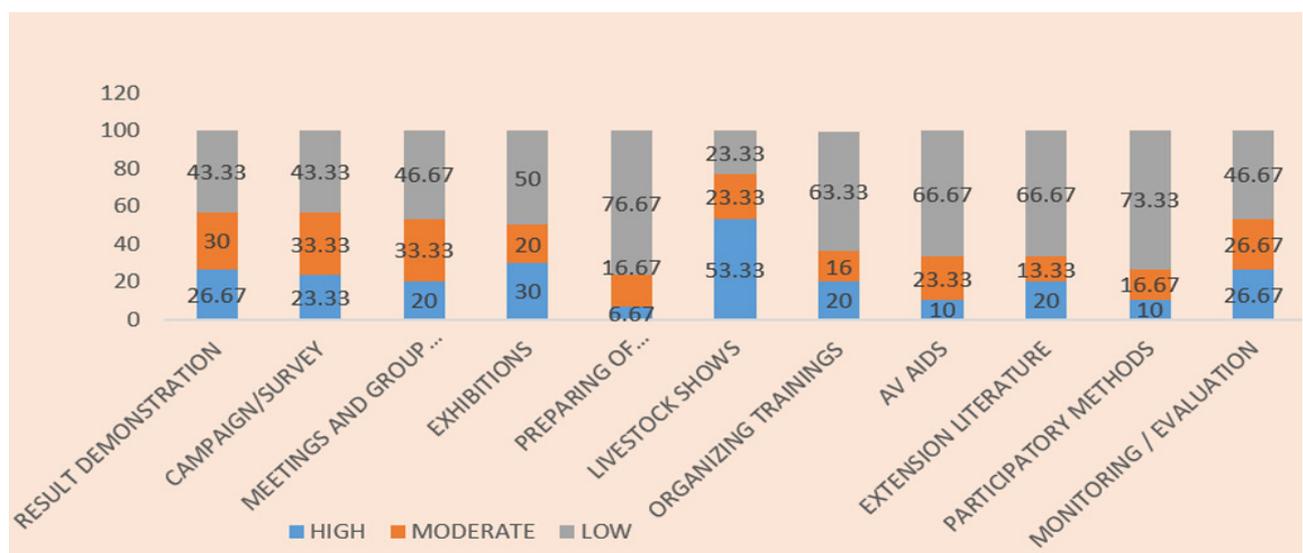
As compared to the veterinarians the perception of the para-vets regarding the livestock extension competencies was comparatively low. None of them considered organizing trainings as important as they considered the practical field level experience is enough to teach them the basic skills they

need to have for their daily work and also the conduction of trainings for the para-vets was very low so they rendered themselves to learn from their field experiences.



**Fig 8 (c):** Level of knowledge professionals regarding extension related competencies (Veterinarians)

As shown in Fig. 18(c) and 18(d) that fair majority of veterinarians and relatively low percent of para-vets have high knowledge regarding extension competencies. The knowledge of vets was low because in general BVSc degree there is not much exposure to these areas of the field level experience and these are gained only through the experience and interest of the professionals. Participatory skill and knowhow about AV aids was found to be moderate among the veterinarians because they are more engaged with the treatment aspect of the profession and give less time to participatory



**Fig 8 (d):** Knowledge level of livestock professional regarding extension related competencies (para-vets)

activities. Regarding AV aids veterinary centers at ground level are having least availability of the AV aid facilities. The skill of AV aids is acquired through the practice and availability.

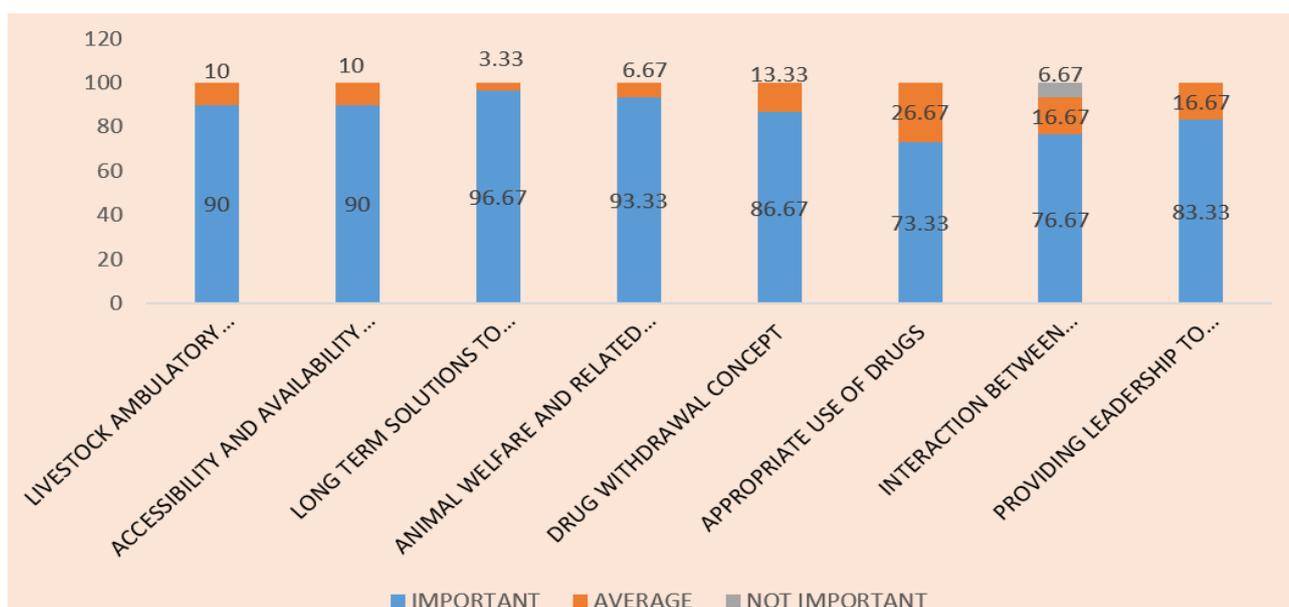
As shown in Fig. 8(d) that para-vets have low knowledge about extension literature, organizing trainings, meetings and group discussions, result demonstrations, campaign and surveys as compared to the veterinarians because all these competencies are related to level of understanding of the technology and related subject Para-vets being from different study backgrounds lack the basic knowledge regarding these areas.

There should be the basic orientation trainings and policies to acknowledge and prepare the newly recruited veterinarians about the livestock extension competencies because at college level there is more concentration towards theory and scientific area than the practical and social areas. The para-vets should be given basic knowledge though trainings and short courses to make them aware about the importance of these competencies at the field level.

The livestock professionals have to be very much knowledgeable regarding these competencies because for promotion, adoption and the dissemination of new technology these competencies play a crucial role. Knowledge Attitude and skill of professionals decide the adoption, rejection, implementation and discontinuation of the technology being promoted.

## 2. Livestock service and welfare related competencies

Perceived importance of "livestock service and welfare related competencies" is high among both veterinarians and para-vets. These competencies are crucial for the livestock extension professionals because the field service and treatment is main mandate of the field VAS and para-vet. The importance



**Fig 9 (a):** Importance of the livestock service and welfare related competencies in extension professionals (Veterinarians)

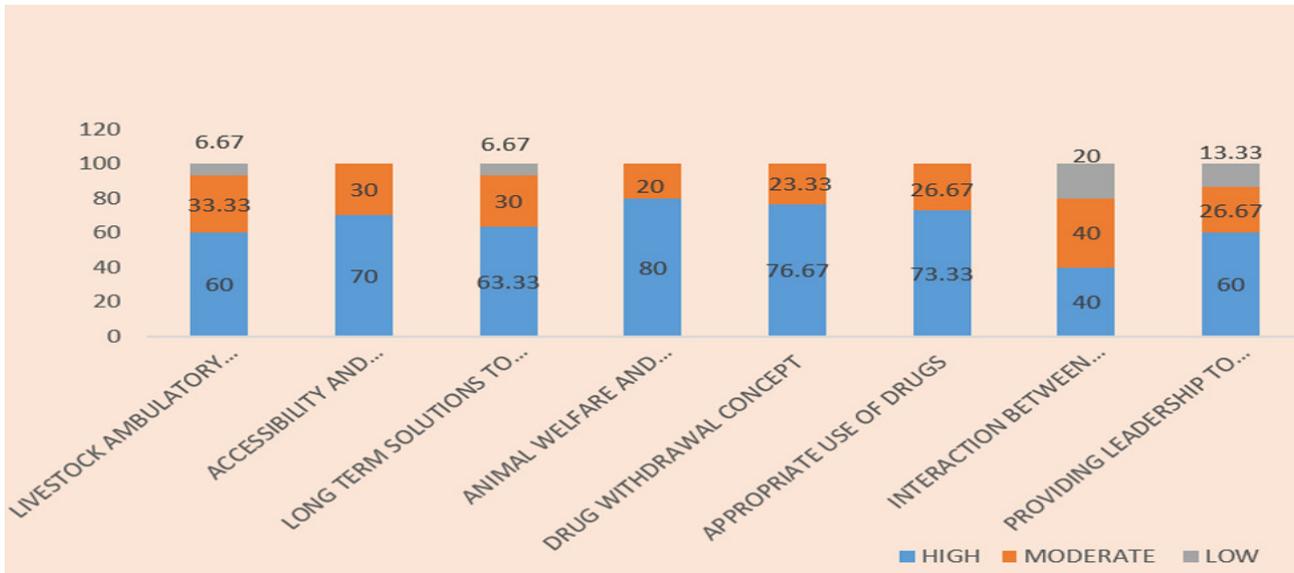
of efficient livestock ambulatory services and to make available and access to input services was found to be slightly higher in case of the para-vets than veterinarians. The para-vets are mainly engaged to perform ambulatory services i.e., going from home to home for treatment in the field conditions. The importance and knowledge about the drug withdrawal and the appropriate use of the drugs was lower in the para-vets than veterinarians. The para-vets prescribe the medicines based on hit and trail method rather than knowing the basic effect and mechanism of action of it. Prescribing treatment is not in the domain of the para-vets but under field conditions they are prescribing medicines indiscriminately without knowing its effects on the animals and humans. They are not able to provide proper information to clients regarding the drug withdrawal and problems associated with it. Due to these reasons meat and the milk reaching the end consumers is not safe in one hand and becomes one of the reason for creating drug resistance in animals on the other hand. Venkatramaiah and Ahuja (2015) stated that there are some serious concerns regarding the quality



**Fig. 9 (b)** Importance of the livestock service and welfare related competencies in extension professionals (Para-Vets)

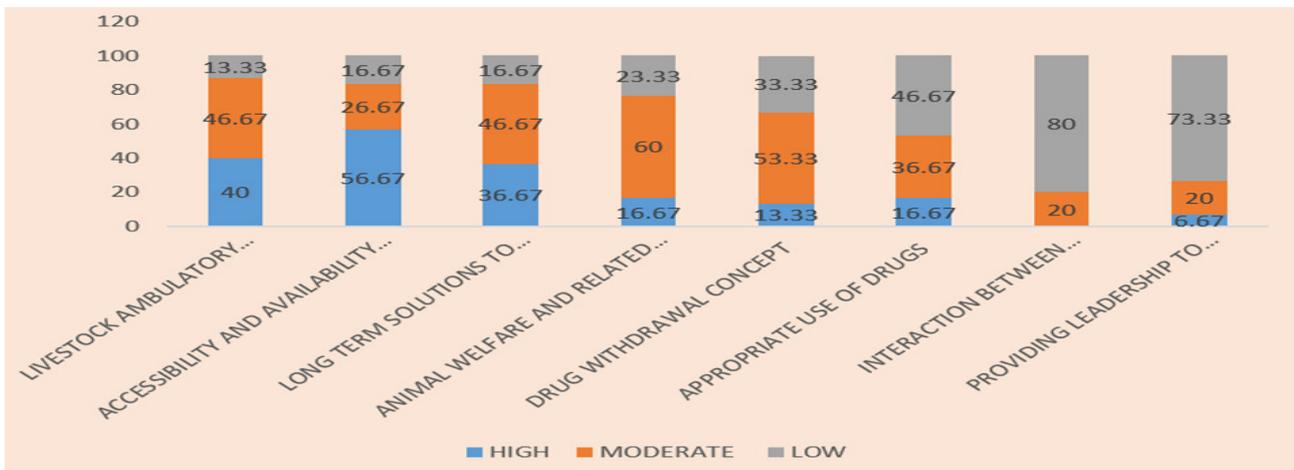
of the services para-vets provide as they go beyond their brief and perform services that they are not equipped or trained with.

Comparing results on the perceived importance of the livestock service and welfare related competencies between veterinarians and para-vets it was found that knowledge level and skill among majority of is high and moderate respectively. Though the importance of livestock ambulatory services and to make available and access to inputs was higher in the para-vets but the knowledge and the basic skill to perform these tasks is higher in case of the veterinarians. The veterinarians have received a basic pre-service training to perform these activities other than para-vets who only get the



**Fig 9 (c):** Knowledge level of livestock professionals regarding livestock service and welfare competencies (Veterinarians)

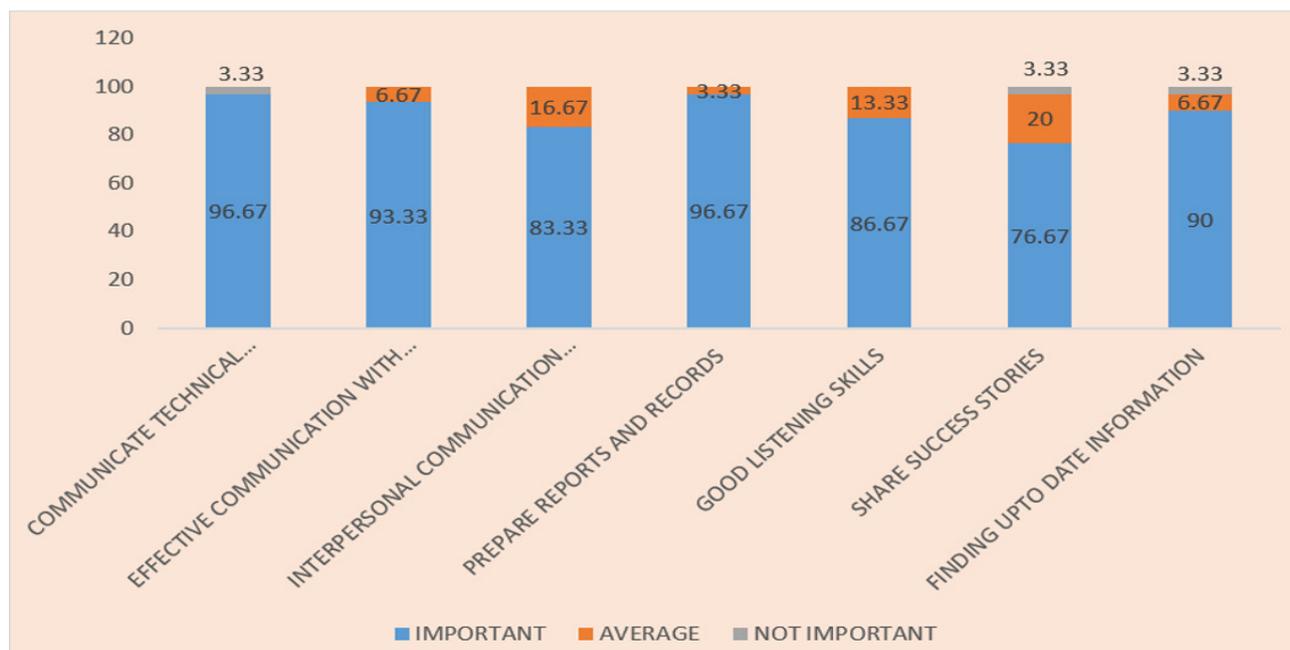
superficial knowledge about these skills once they are recruited into the job. The knowledge about the animal welfare, drug withdrawal and the appropriate use of drugs is lower in para-vets due to lack of basic training in these areas of the profession.



**Fig. 9(d):** Knowledge level of livestock professionals regarding livestock service and welfare competencies (Para-Vets)

The knowledge or the skill regarding the interaction in-between state and other state veterinary service agencies is average in majority of veterinarians (40%) and least (80%) in majority of para-vets. As it is also evident in the Fig. 5(a) regarding "linkage with veterinary agencies" that majority of the extension professionals are having least linkage with research institutes. This is also reason for low transfer of the research findings from the research institutes to state veterinary departments and hence to the farmers. Lack of proper linkage between the state departments and interactions in-between the other state veterinary agencies becomes one of the reason for low exposure and interaction. The knowledge of the para-vets regarding interaction within and outside state veterinary

agencies and leadership skills are very low because most of para-vets are having low qualification so are facing hindrances in exposure and interaction.

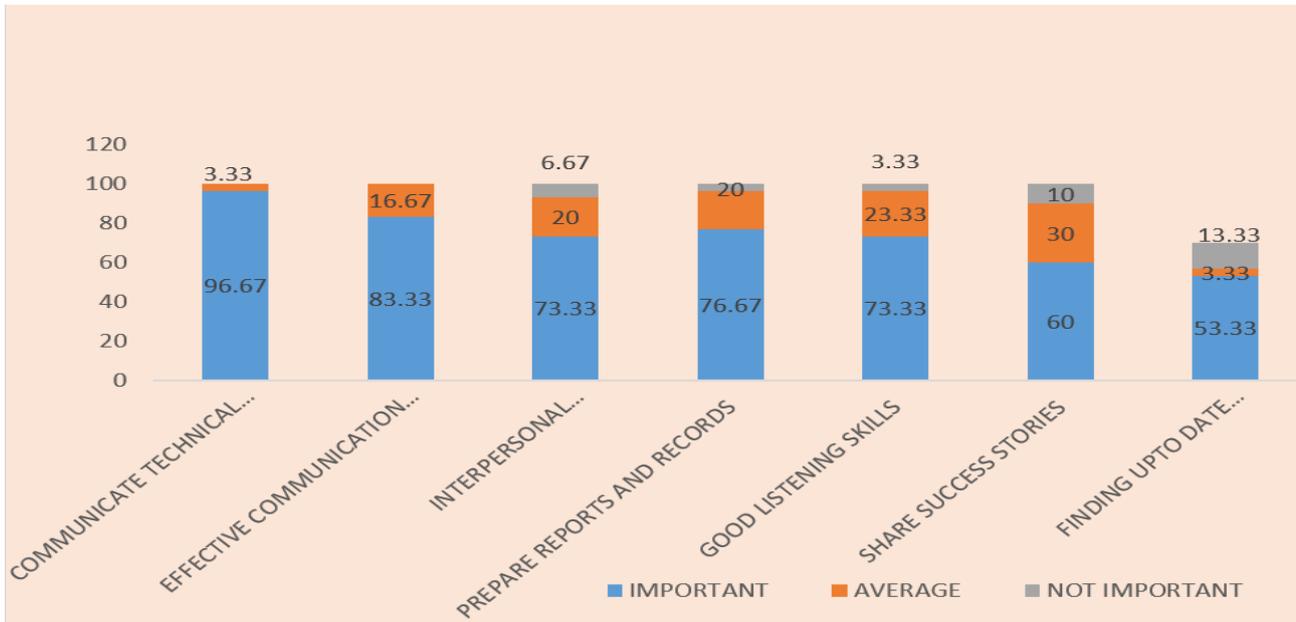


**Fig. 10 (a):** Importance of communication competencies to livestock extension professionals (Veterinarians)

Knowledge and skill regarding livestock service and the welfare is very important as far as the job of livestock professionals is concerned. Para-vets who are mostly engaged in administering drugs and to do field have more interactions with farmers. They should be provided basic knowledge and information regarding the importance of animal welfare, drug withdrawal times and dangers of the indiscriminate use of the drugs to animals in particular and food chain in general. There should be improvement in knowledge and skill regarding the interaction with other veterinary agencies to reap the benefits of interactions and sharing hand on experiences. The scope and challenges in extension services is increasing with every passing day. Sulaiman and Davis (2015) proposed that ensuring the quality of services, strengthening collaboration and synergy among extension service providers remains a challenge with extension providers.

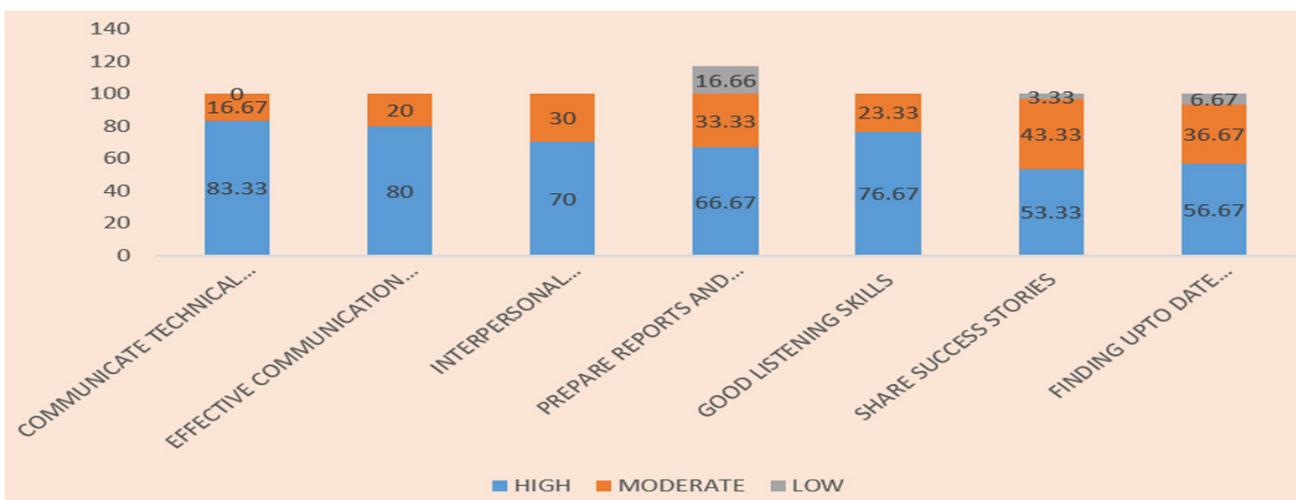
### 3. Communication competencies

The Communication competencies are perceived to be important by majority of both veterinarians and the para-vets viz., to communicate technical information in a way general public can understand (96.67% for both), communicate effectively with fellow professionals to exchange technical and practical experience (93.33% & 83.33% for vets and para-vets respectively). To share success stories was perceived important by more veterinarians (76.67%) than by the para-vets (60 %) and to find up to date information was perceived important by 90 percent of the veterinarians and 53.33 percent of the para-vets. Being important stakeholders responsible for the efficient delivery of health and advisory services to the farmers veterinarians consider up to date information as the need of the



**Fig. 10 (b):** Importance of communication competencies to livestock extension professionals (Para-Vets)

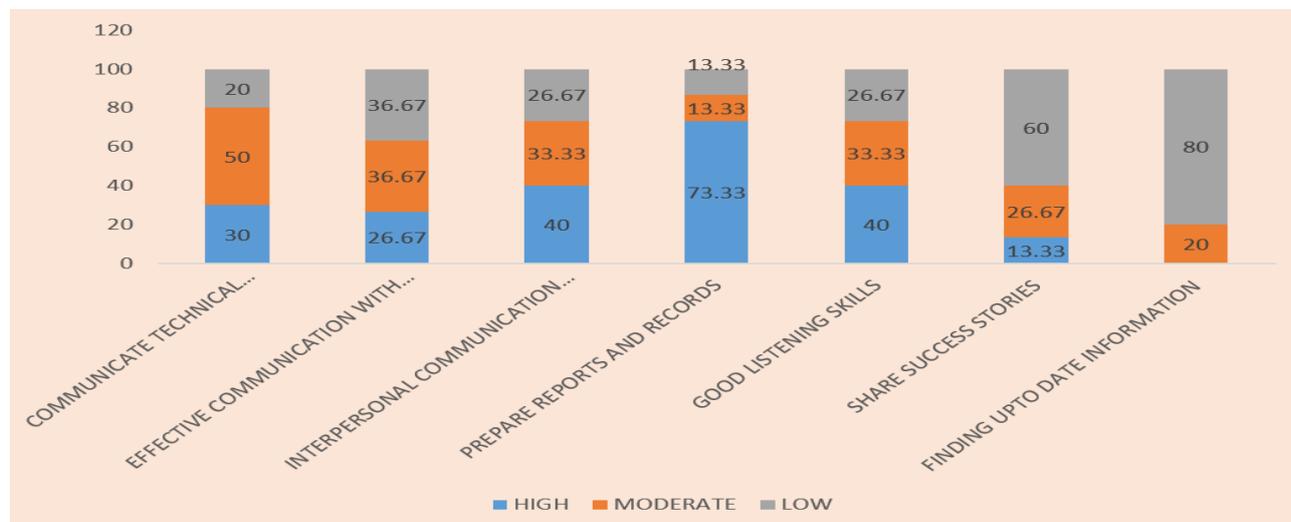
hour. While as para-vets mostly disseminate the technology, administer the treatment prescribed by veterinarians. The importance of preparing reports is perceived important by both veterinarians and of the para-veterinarians. The reports are more important from the view point of veterinarians because they have to present the records and be answerable in the monthly meetings held in Animal Husbandry departments. More ever for the proper supply and efficient working of the system the importance of records is more understood to veterinarians as compared to para-vets.



**Fig. 10 (c):** Knowledge level of livestock extension professionals regarding the communication competencies (Veterinarians)

Knowledge and skill of veterinarians regarding communication competencies is high. Effective communication was considered basic for any kind of extension activity in order to be useful in long run. The stronger the relationship and feelings of trust, the quicker is the adoption of the recommended

technology and practices (Suvedi and Kaplowitz, 2016). The knowledge level of para-vets regarding the same was found to be moderate to low except for preparation of the reports that was high (73.33%).



**Fig. 10 (d):** Knowledge level of livestock extension professionals regarding the communication competencies (Para-Vets)

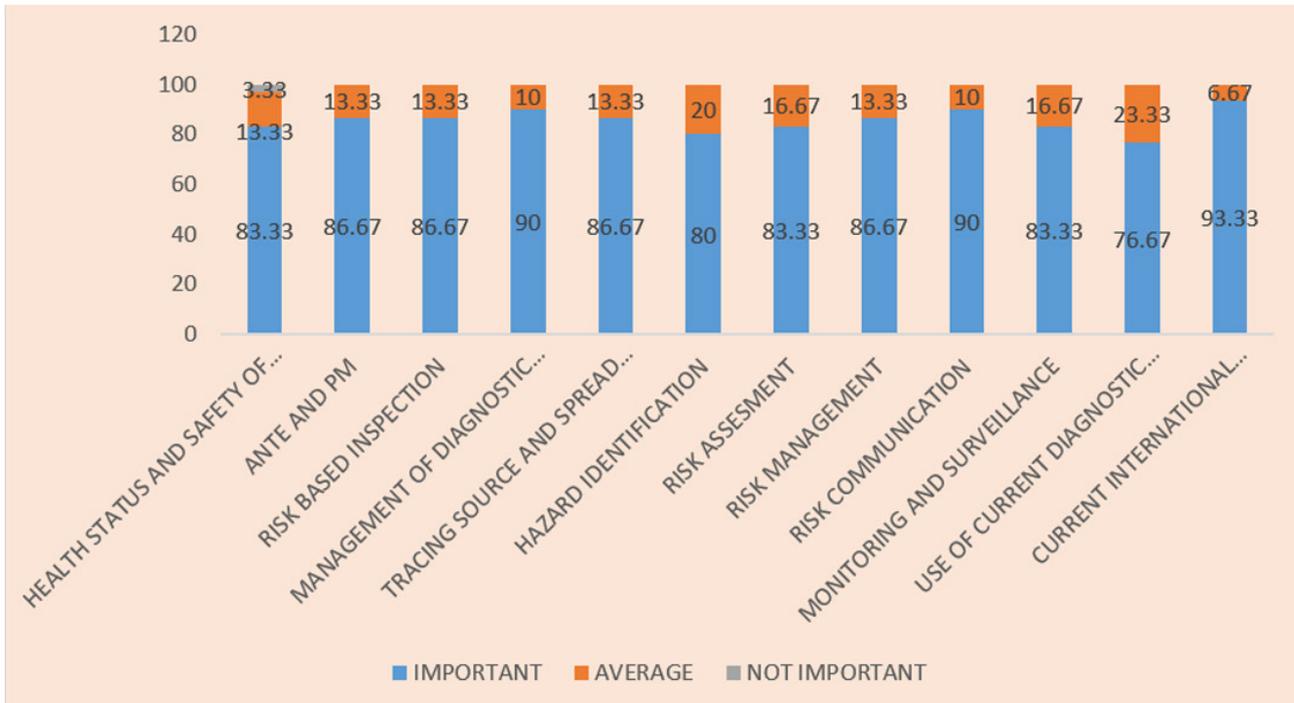
The importance of the report preparation was higher in the veterinarians but the skill is more with the para-vets as they are the actual persons in veterinary centers who mainly perform this job on daily basis as shown in Fig. 10(b). The veterinarians are having the knowledge about all the technologies and complications in more efficient way. Person having high knowledge about what he/she promotes or preaches gives much better results and has higher acceptance power. The veterinarians know that satisfied client is the best marketing. Well attended farmers get more motivated to adopt the new technology. The skill to find up to date information is low in majority (80%) of the para-vets due to their low qualification and understanding. It becomes a major hindrance in getting updated knowledge from latest sources of information.

The knowledge to share success stories was lower in veterinarians as compared to other communication competencies but majority of para-vets were having low skill (60%) to perform this task.

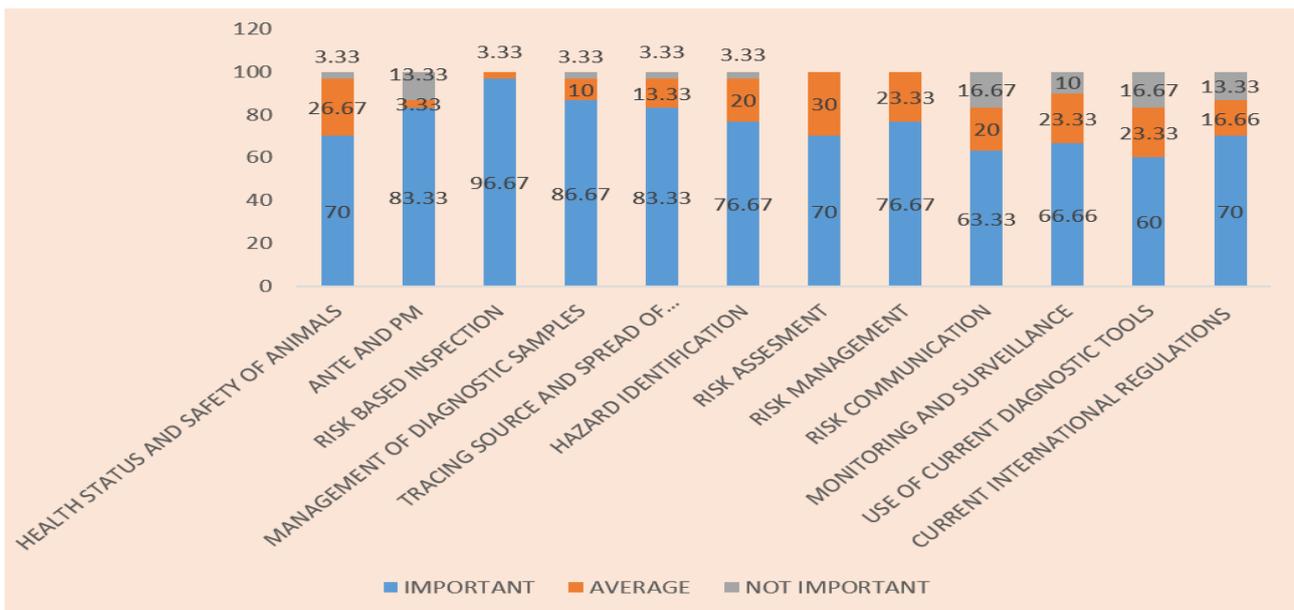
#### 4. Risk analysis competencies

Risk analysis is very important task in order to have better prevention of diseases in animals and to achieve efficient production levels. And majority of veterinarians were well equipped with this knowledge.

Risk analysis is perceived as important by the majority of para-vets though comparatively lower than veterinarians. The para-vets considered competencies regarding risk communication, monitoring and conducting initial surveillance of diseases to include epidemiological information to public



**Fig. 11 (a):** Importance of risk analysis competencies (Veterinarians)

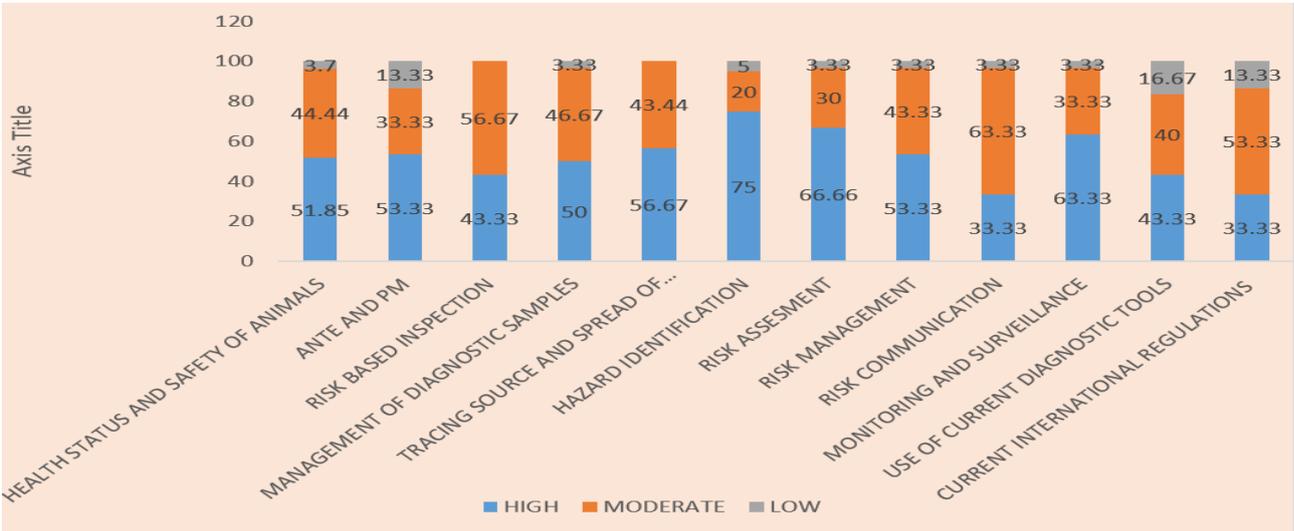


**Fig. 11 (b):** Importance of risk analysis competencies (Para-Vets)

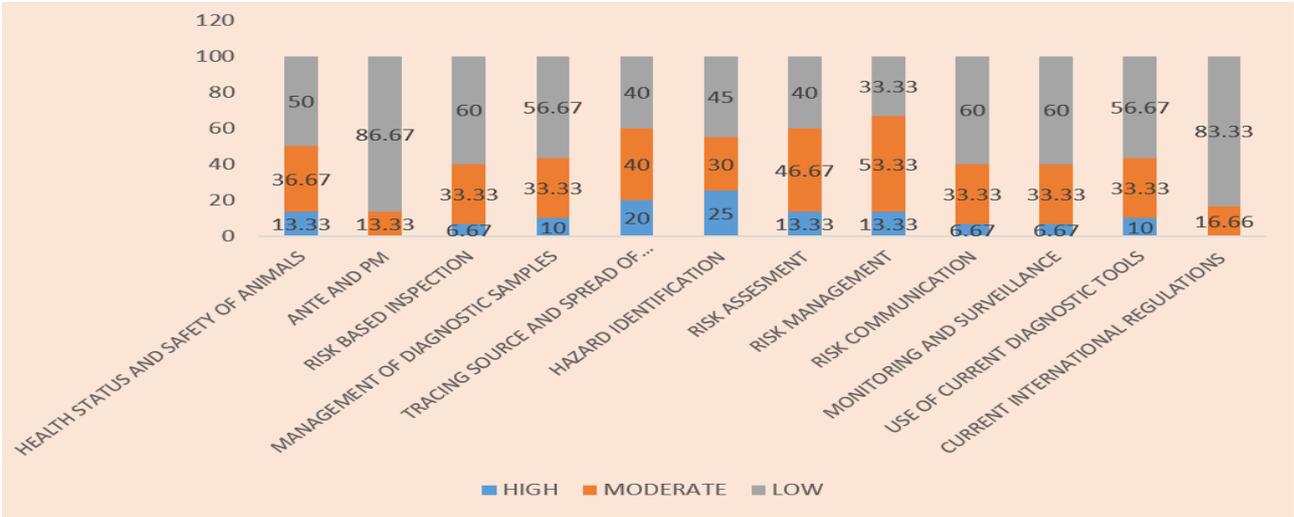
health practitioners and use of current diagnostic tools as comparatively less important than other competencies in this category. The para-vets are less concerned with these competencies according to their job profile hence to which they consider it less important.

Knowledge level of the majority of veterinarians as shown in Fig.11(c) is moderate regarding some important risk analysis competencies like the current international regulations (53.33%), risk communication (63.33%), risk based inspection (56.67%) respectively. The transport of animals animal products involve a high degree of risk to the animals, humans and to import export related

issues. The risk analysis related issues in today's global village of emerging and re-emerging disease is of utmost importance. The livestock professionals need to be highly updated with these skills and should be able to disseminate information related to these issues to the lower staff and to the livestock farmers also. According to OIE more than 70% of the diseases in the world are zoonotic. Veterinarians as important stakeholders in livestock and related issues should be highly updated to save animals, human and community as a whole from these life threatening issues.



**Fig. 11 (c):** Knowledge level regarding the risk analysis competencies (Veterinarians)

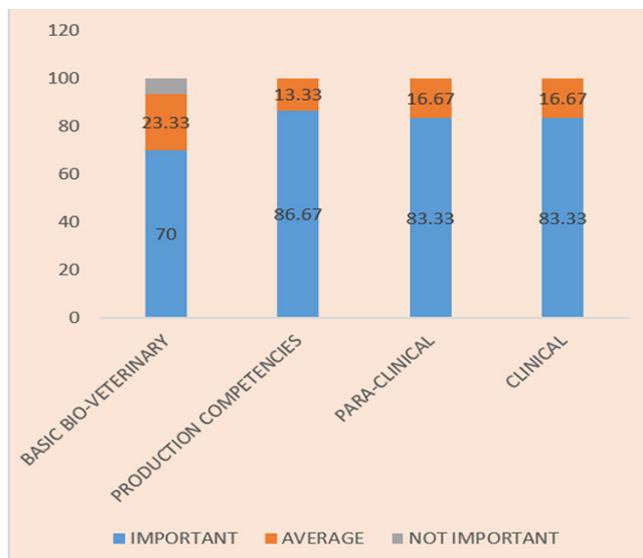


**Fig. 11 (d):** Knowledge level regarding the risk analysis competencies ( Para-Vets)

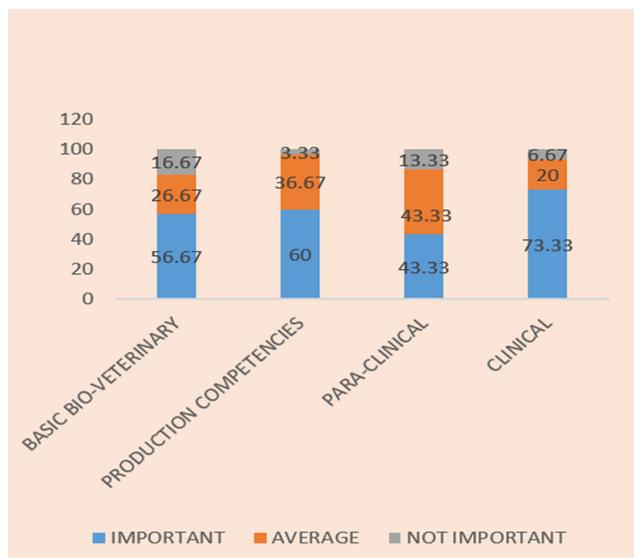
Para-veterinarians are having low level of the knowledge and skill regarding the risk analysis as indicated in Fig 11(d). The para-vets form an important link along with veterinarians in disseminating and transfer of the information and technology to livestock farmers. At many places VAS (Veterinary assistant surgeon) is not always available to some areas and para-vets have more responsibilities at such places. This calls for an urgent need to provide sufficient knowledge and update para-vets regarding important risk related issues. These competencies if neglected can prove fatal to the livestock, livestock farmers, locality, professionals and community on overall basis. As stated by OIE in

its document on core competencies of day first graduate that national Veterinary Services should be able to meet standards adopted by each country, but should also be able to comply with appropriate international standards and recommendations, particularly those in the OIE's Terrestrial Code.

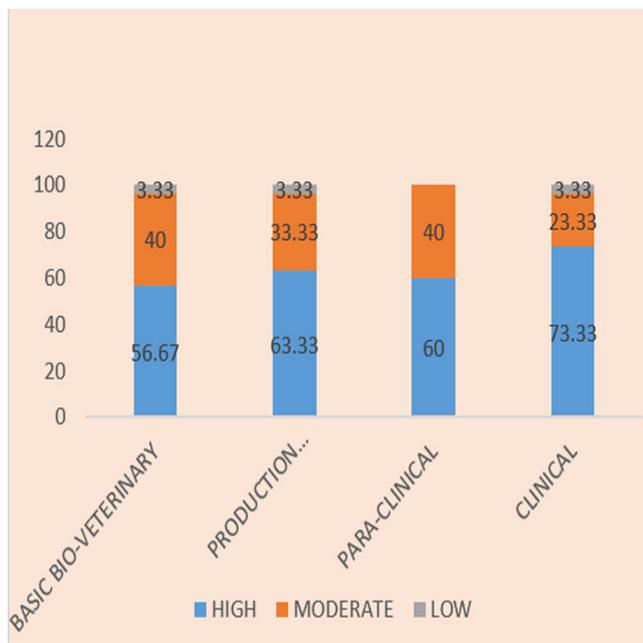
### 5. Subject matter related competencies



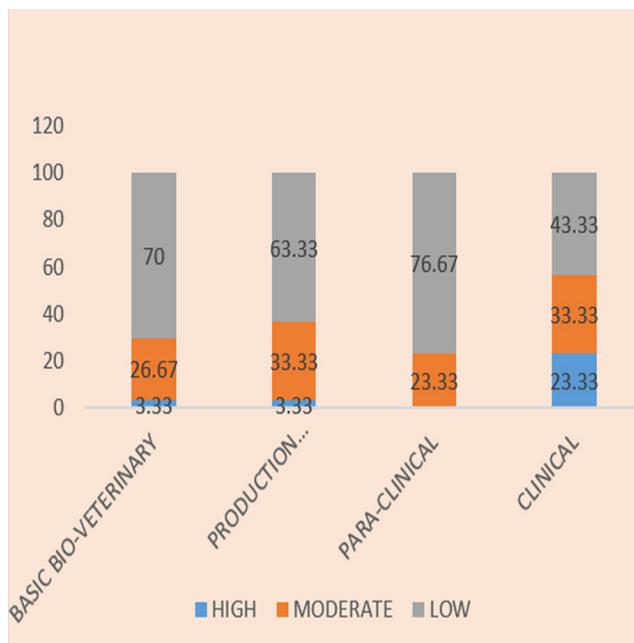
**Fig. 12 (a):** Importance of basic subject matter competencies (Veterinarians)



**Fig. 12 (b):** Importance of basic subject matter competencies (Para-Vets)



**Fig.12 (c):** Knowledge level of livestock extension professionals regarding basic subject matter competencies (Veterinarians)



**Fig. 12 (d):** Knowledge level of livestock extension professionals regarding basic subject matter competencies (Para-Vets)

Livestock professionals perceive subject matter related competencies as important. Because these are the basic pre-service subjects taught before qualifying for the post of field livestock extension

person. Veterinarians were having high competencies regarding basic bio veterinary, production, para-clinical and clinical competencies. As shown in Fig.12 (a) majority of para-vets perceive clinical (73.33%), production (60%), basic bio-veterinary (56.67%) and para-clinical (43.33%) competencies as important. In comparison to veterinarians, para-vets perceive these competencies less important. Majority of the livestock professionals are having high subject matter related competencies. 73.33 percent have high knowledge and skill regarding clinical competency like medicine, surgery and gynaecology as shown in Fig. 12(c). These are the most needed skills in the field level veterinarians as a major mandate of VAS is treatment of the animals. The production competencies are also high in majority of professionals. Livestock is mainly reared for production purposes and to support their livelihood. Livestock professionals should be upto date with these competencies. These results are on contrary with the results of Sasidhar and Suvedi, 2016 who reported lower production competencies in livestock extension professionals.

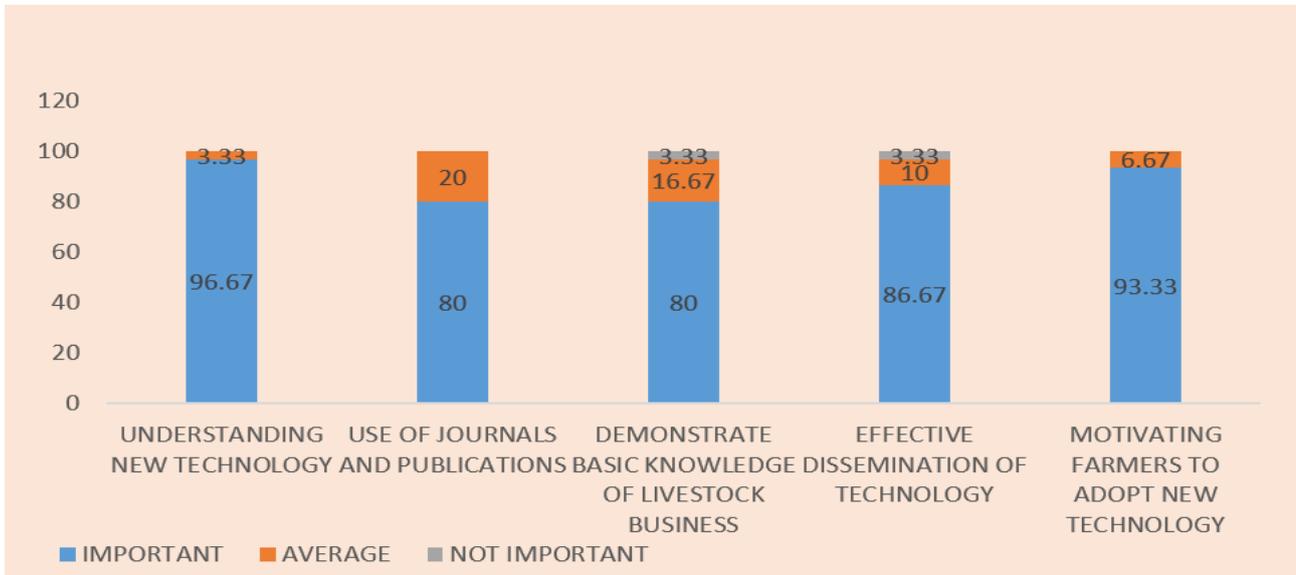
There is need for more in service trainings regarding subject matter related competences as these competencies are basic to any veterinary graduate and he/she should be very much perfect regarding these competencies in order to do justice with the profession. The OIE highlights the key contribution made by veterinarians in society to assure the health and wellbeing of animals, people and ecosystems and advocates for the importance of high quality veterinary education – both initial and continuing (OIE, 2012).

Basic subject related competencies are low in majority of the para-vets as indicated in Fig.12(d). The Para-vets are usually from other fields or the general line subjects. They don't have expertise or training regarding these subjects that is revealed by a huge gap between perceived importance and level of knowledge of these competencies. Considering the importance of these competencies and shortage of the veterinarians at ground levels, para-vets remain the sole source of livestock service to farmers in majority of areas. This calls for need of more in-service trainings to field extension functionaries on production, para-clinical and clinical competencies as suggested by Sasidhar and Suvedi (2016) in their study regarding core competencies.

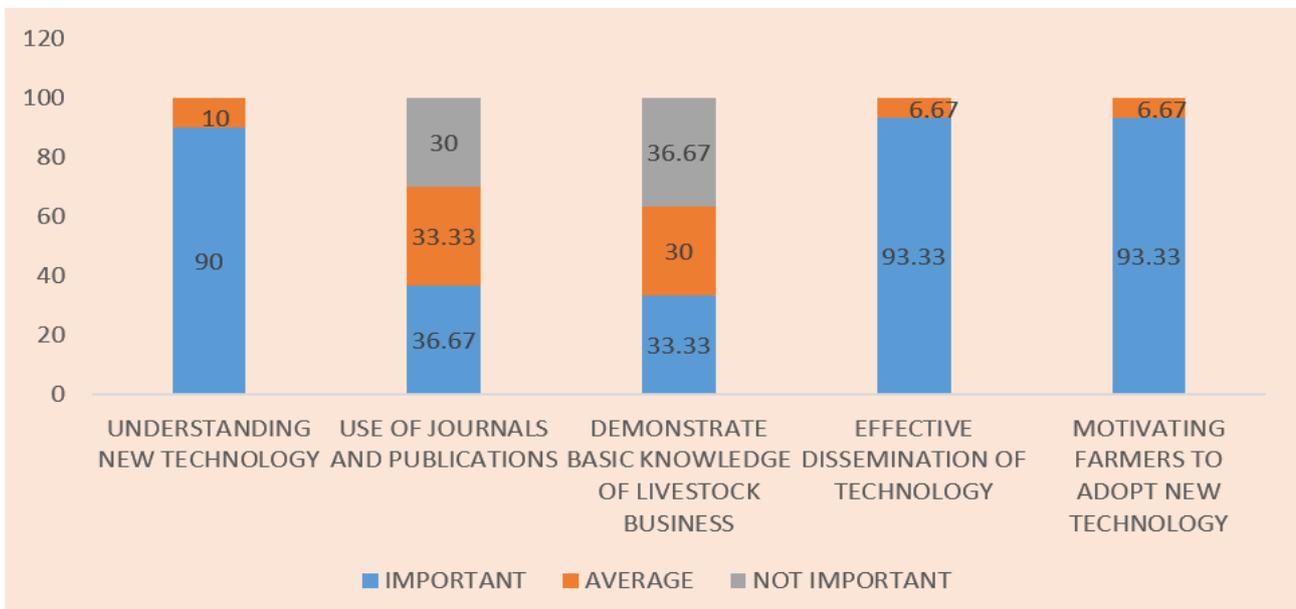
Veterinary education is a cornerstone to assure that the graduating veterinarian not only has received a level of education and training that ensures sound overall competencies, but also has the required knowledge, skills, attitudes and aptitudes to understand and be able to perform entry-level national veterinary service tasks that relate to the promotion of animal and public health (OIE,2012).

## **6. Technical subject matter application competencies**

Technical subject matter competencies are perceived important by the majority of the livestock extension professionals (both veterinarians and para vets). While majority of veterinarian (above 80%) perceived all of the technical competencies as important, para-vets consider use of journals and publications, to demonstrate basic knowledge of livestock business and entrepreneurship as not so much important (Fig.13 (a) & 13(b)).



**Fig 13 (a):** Importance of technical subject matter application competencies (Veterinarians)

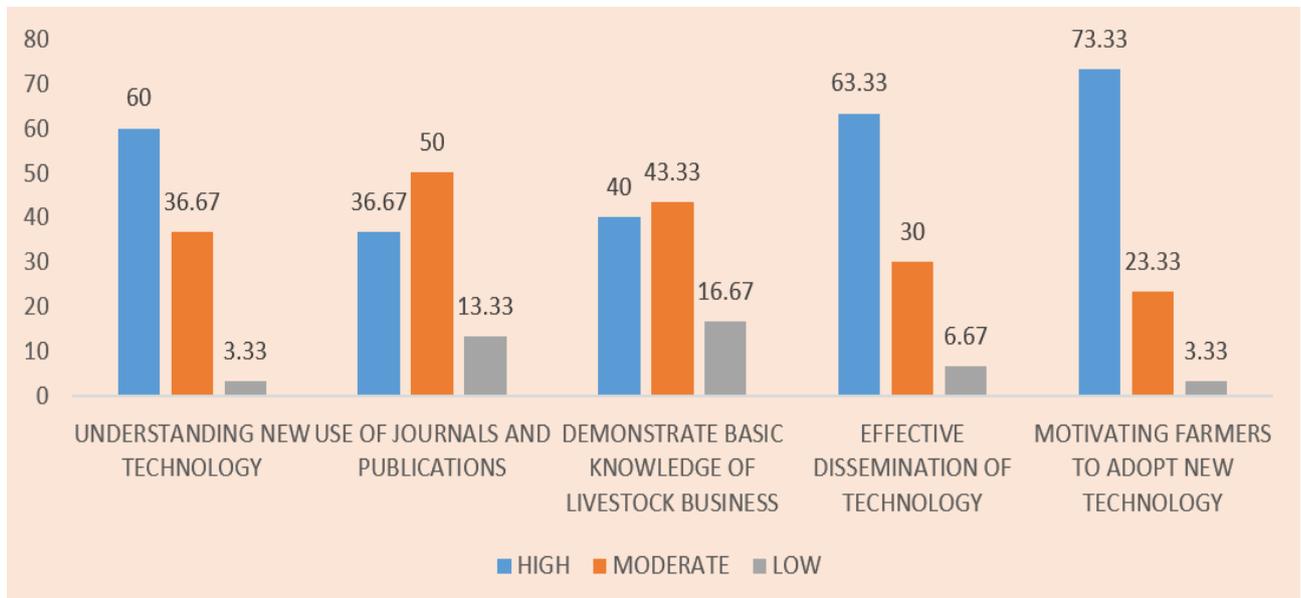


**Fig 13 (b):** Importance of technical subject matter application competencies (Para-vets)

The technical information application is very important as per the role of the extension professional is concerned as extension from the Indian context is prescriptive in nature and is mainly concerned with transfer of technology.

Knowledge level of the veterinarians regarding technical subject matter competencies was found to be high and of para-vets mainly falls between average to low. Results in Fig.13(c) indicates that veterinarians were having high knowledge and skill to understand new technology (60%), disseminate the technology (63.33%) and motivate farmers to adopt new technology (73.33%). The knowledge level regarding the use of journals and publications was moderate (50%) followed by high (36.66%). The young veterinarians in the field were mostly having the specialization regarding some particular subject of the veterinary subject areas and know better use of the journals and publications but

the senior officials were having qualification up to BVSc level only that may be a reason for low level of knowledge about the use of publications and journals. More ever field VAS are engaged in tiring job of treatments and surgeries during whole of their time and get less time to explore the journals and publications. The knowledge to demonstrate the basic knowledge regarding business and entrepreneurship was also moderate in majority that shows that the livestock professionals are better at the technology transfer part as compared to the human resource development part.



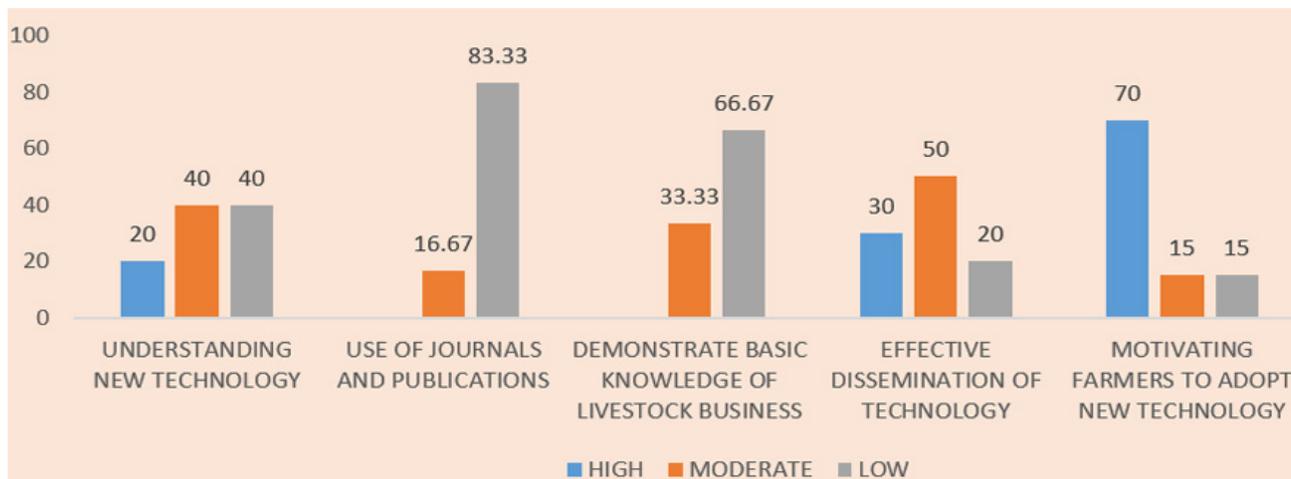
**Fig 13 (c):** Knowledge level regarding technical subject matter related competencies (Veterinarians)

Among para-vets knowledge about the technical subject matter related competencies were low as compared to the veterinarians. Huge majority of the para-vets (83.33%) were having low knowledge and skill to refer journals and publications (Fig. 13(d)). This may be because the large majority of the para-vets were having qualification of 10th -12th standard only. The para- vets have moderate to low knowledge and skill to understand new technology being promoted as they get known to technology at the dissemination stage therefore lack basic understanding of technology.

The para-vets are having high motivating skill and knowledge because para-vets are mainly localities and are having good skill to motivate farmers. The motivating power of veterinarians is due to their knowledge and training and para-vets are having on par motivating power with veterinarians by being due to their trustworthy localite nature.

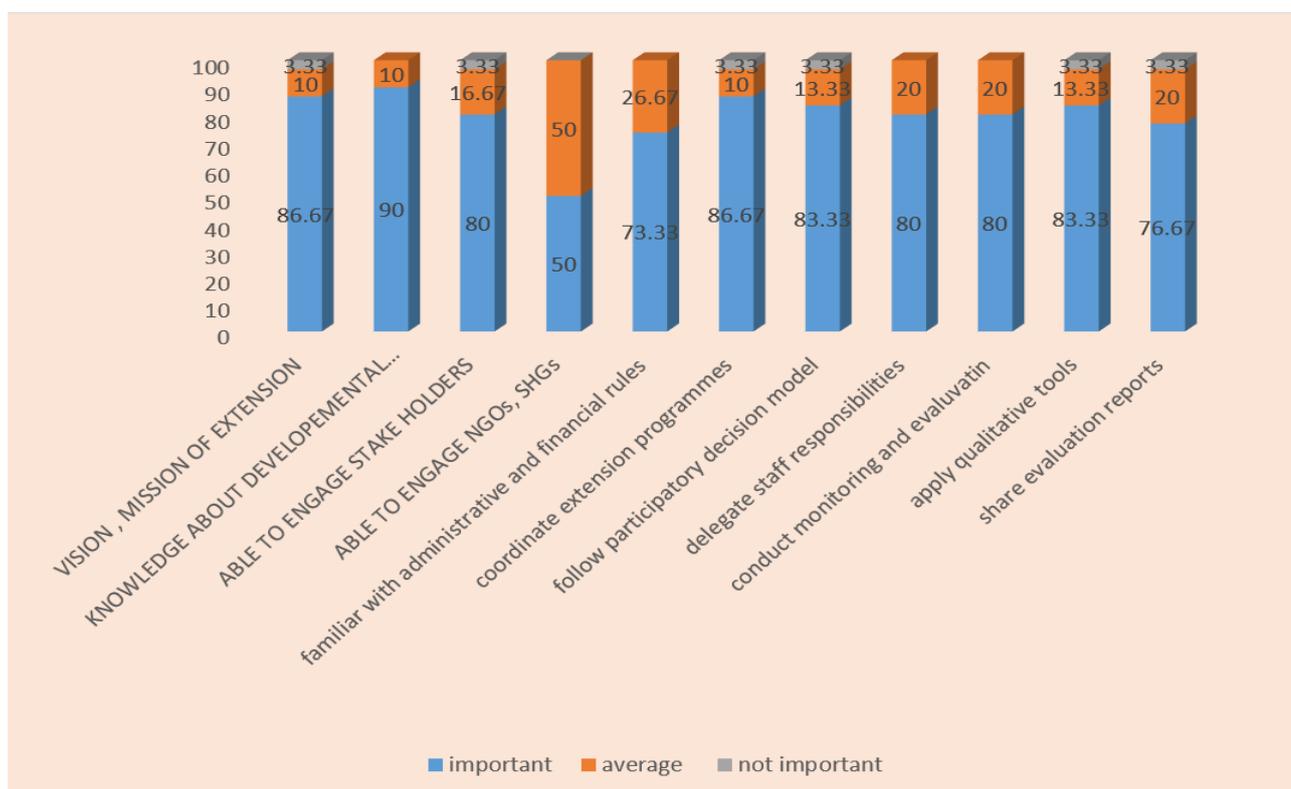
There is immediate need of the refresher trainings for veterinarians and frequent in-service trainings for the para-veterinarians in order to develop required competencies in them. Although veterinarians have higher knowledge level regarding these competencies than para-vets still there is a huge difference between the perceived importance and current knowledge level about these competencies in both veterinarians and para-vets. Conferences, symposiums and seminars should be regularly conducted in Animal husbandry departments, research institutes etc. There should be separate level of programmes for veterinarians and the para-vets considering the different needs of their job and level of understanding. As reported by Shashidhar and Suvedi (2016) that spending time on reading

up on recent research can help extension professionals choose technologies and practices to be able to address the farmers emerging needs that are well-suited to the local environment and people and sustainable over the long term.



**Fig. 13 (d):** Knowledge level regarding technical subject matter related competencies (Para-vets)

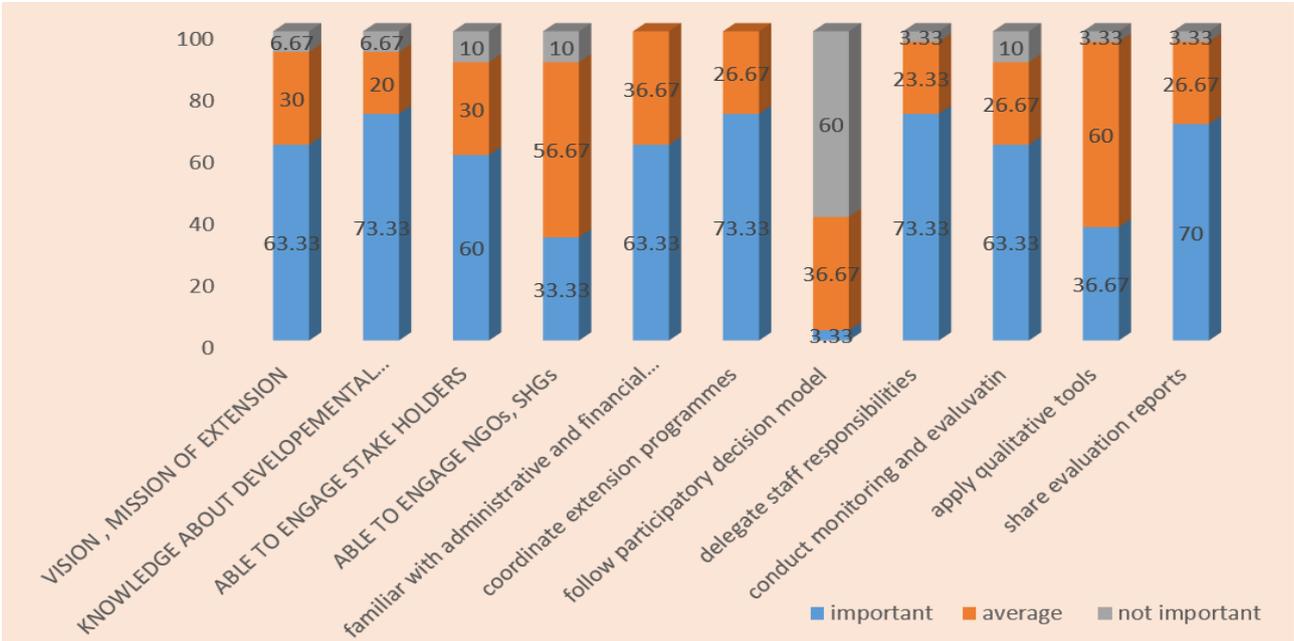
## 7. Livestock extension programme planning competencies



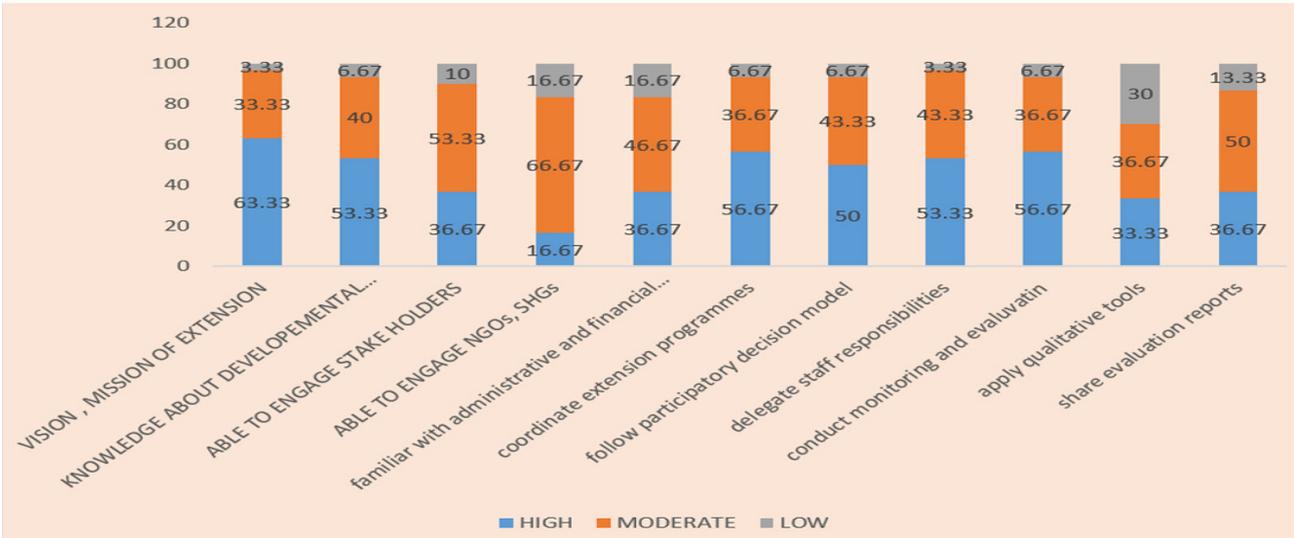
**Fig. 14 (a):** Importance of extension programme planning competencies (Veterinarians)

Extension programme planning competencies were perceived as important by majority of veterinarians. It can be seen in Fig.14(a) among all these competencies the ability to engage stakeholders was perceived as important and average by equal proportion of veterinarians (50%).

Comparing the Results in Fig. 14(a) and Fig.14(b) it can be seen that programme planning competencies were perceived less important by para-vets as compared to the veterinarians. Majority of the para-vets perceived 'to follow participatory decision model as low (60%) important, apply qualitative tools as average important (60%).

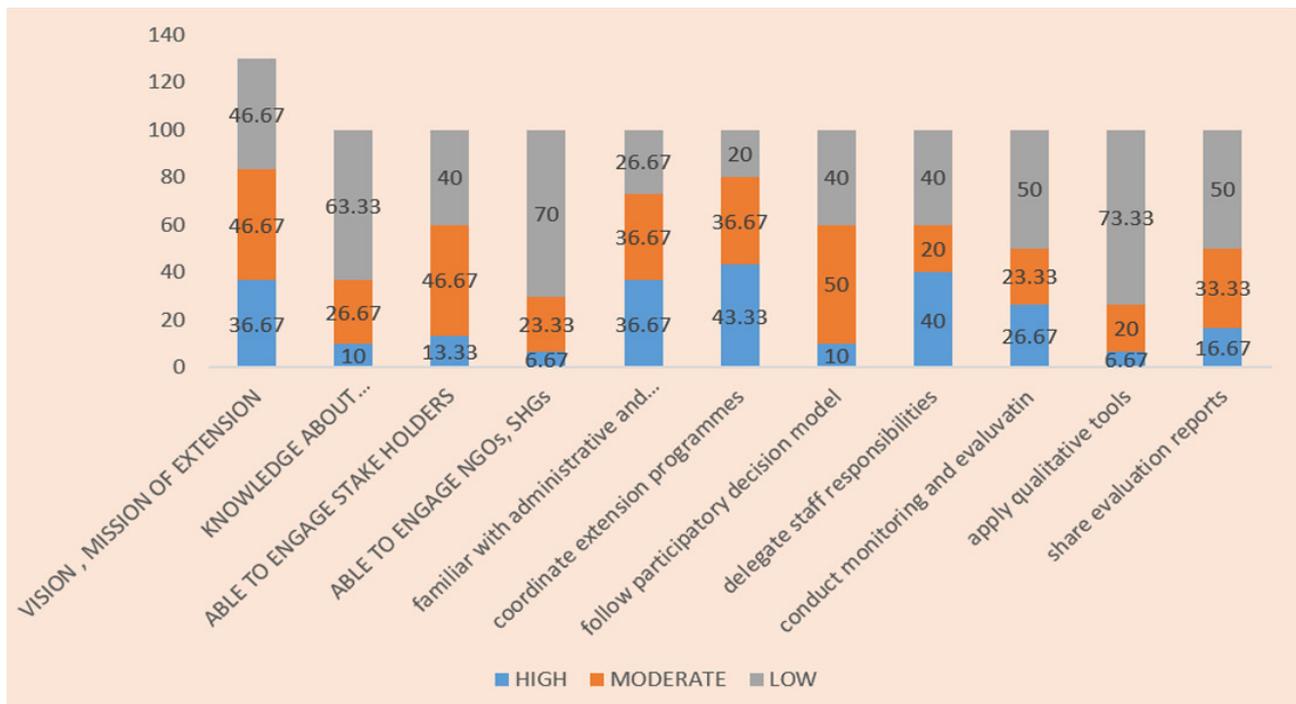


**Fig. 14 (b):** Importance of extension programme planning competencies (Para- Vets)



**Fig.14 (c):** Knowledge level regarding livestock extension programme planning (Veterinarians)

There is a gap between the perceived importance and current level of knowledge in both veterinarians and the para-vets. Only 53.33% of the veterinarians and 10% of the Para-vets were having high knowledge about national livestock developmental strategies, programmes and policies as shown in Fig.14(a) & Fig.14(b).The field level livestock extension professionals are mostly aware about very few livestock related programmes. There is urgent need to improve knowledge of professionals about these competencies as they are the main disseminators, conductors and facilitators of these



**Fig. 14 (d):** Knowledge level regarding livestock extension programme planning (Para-vets)

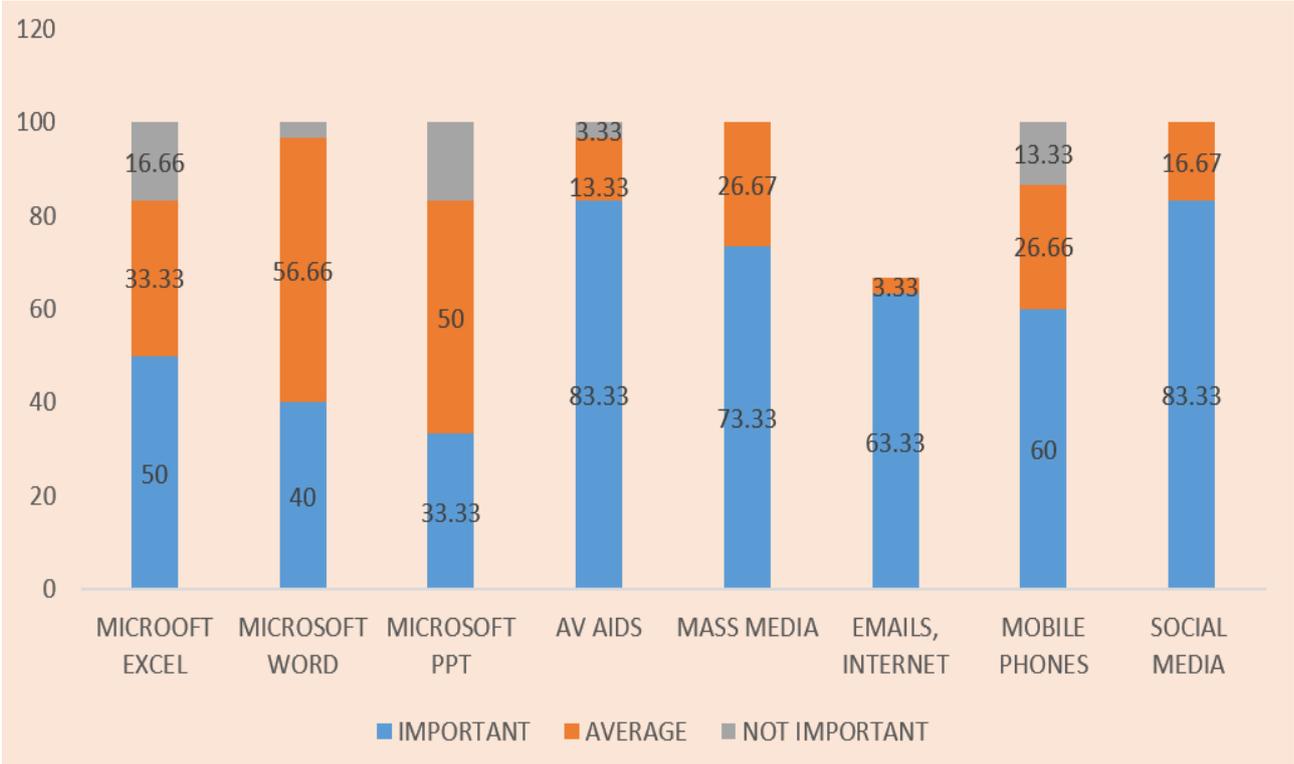
programmes. In order to achieve national and regional goals extension professionals have to be cognizant of national policies, strategies, programmes, rules and regulations. Ability to engage stakeholders like NGO's and SHG's is low among the majority of professionals. The NGOs working at the ground level in livestock sector are very meager in the Kashmir. This leads to the less importance and knowledge about these agencies among the livestock professionals. The competency regarding the sharing of evaluation and reports within organization and with stakeholders is medium and low among majority (50% each) of veterinarians and para-vets respectively.

The results in Fig. 14(c) & 14(d) reveal that the livestock extension professions are mostly lacking behind in the programme planning competencies. From the identification of the problem till the implementation and evaluation of the programmes the livestock extension professionals should have high competence and involvement in these programmes in order to get effective results. The knowledge about the national programmes and ability to engage all stake holders and ensure their participation in the programmes should be high. As per Sasidhar and Suvedi, (2016) livestock extension professionals should be able to implement extension programmes by coordinating activities and collaborating with development partners within their assigned area or communities by building teamwork, involving local stakeholders and negotiating when conflicts arise.

### 8. Informational and technology competencies

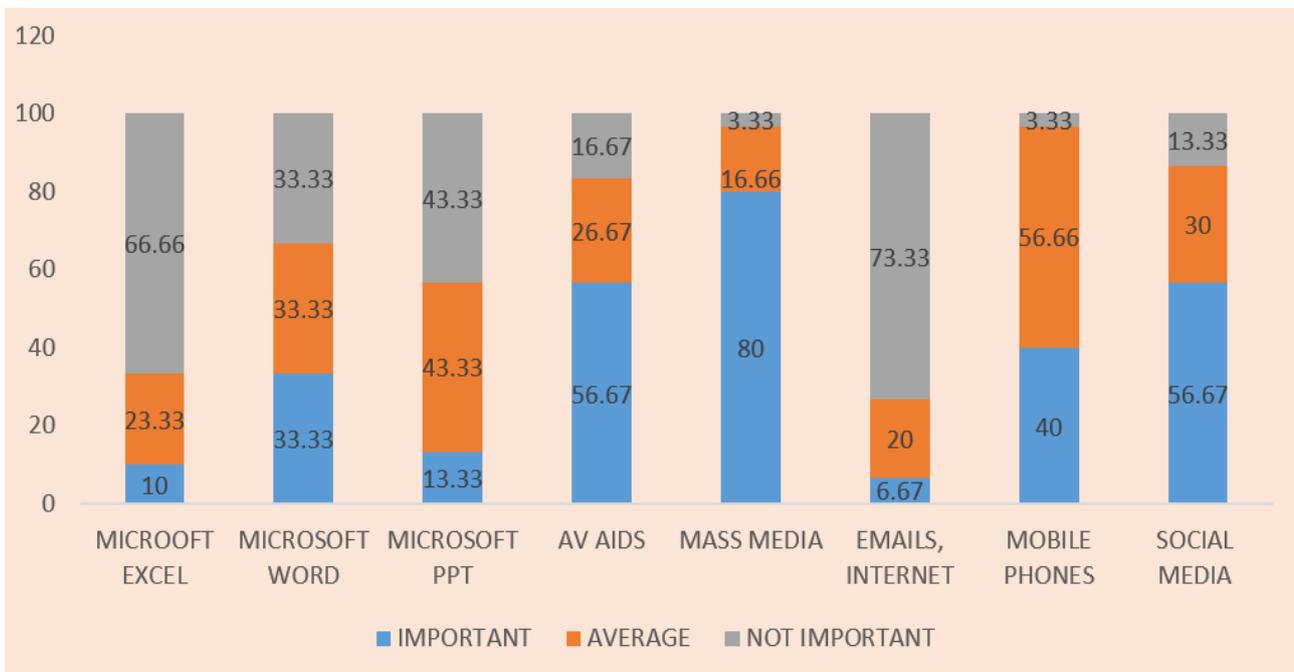
There is a huge gap between the perception about the importance of the information and technology competencies between veterinarians and para-vets. Majority of veterinarians perceive information and communication technologies like social media, mass media, AV aids as important while as Microsoft excel, Microsoft word and Power Point were perceived as average important to important

(Fig.15 (a). This age of digital technology the main source of information utilized by the farmers are the mass media and social media and being connected to farmers through these channels is the need of the hour. While as microsoft skills are not much required at the actual field conditions that can be the reason of considering it less important by the extension professionals. The importance of the information and technology competencies were considered of average important to low importance by majority of para-vets except audio visual aids, mass media and social media they were considered as important by majority (Fig.15(b).



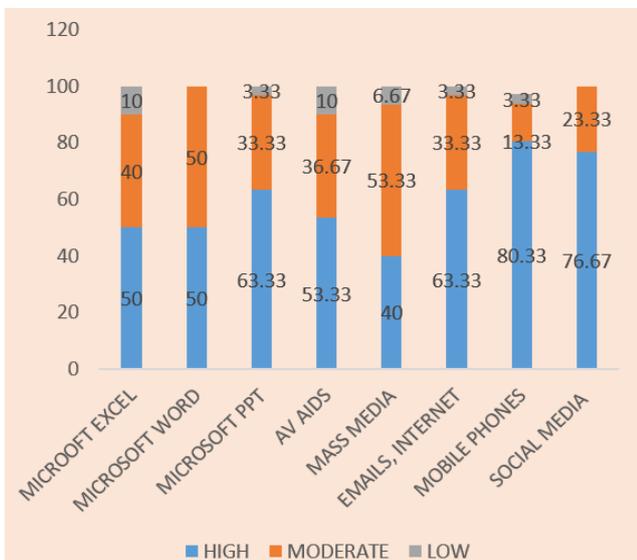
**Fig 15 (a):** Importance of information and technology competencies (Veterinarians)

Majority of veterinarians are having medium knowledge level and skill regarding mass media, micro soft excel and micro soft word as shown in Fig.15(c). Microsoft word and excel are not much needed in the field level activities with which extension professionals are mainly engaged. The veterinary professionals with Masters degrees are possessing good skills with Microsoft applications. Senior veterinarians are more expert in giving information through mass media channel and juniors in the field are highly skilful regarding the latest technologies. For field level extension workers these competencies are not of much importance. The knowledge regarding the mobile phones and social media is high among the majority of veterinarians because in present digital world mass media and social media are the easy and cheapest ways to disseminate information. The veterinarians have started giving information to the farmers through SMS and the whatsapp messages and update farmers with recent programmes and happenings in the field. Some veterinarians has made facebook pages and update daily cases, surgeries over it. This way both the farmer community and veterinarians are getting knowledge about the new cases coming in the field. A discussion plate form is created for all the veterinary professionals of state in particular and the world in general. The central veterinary

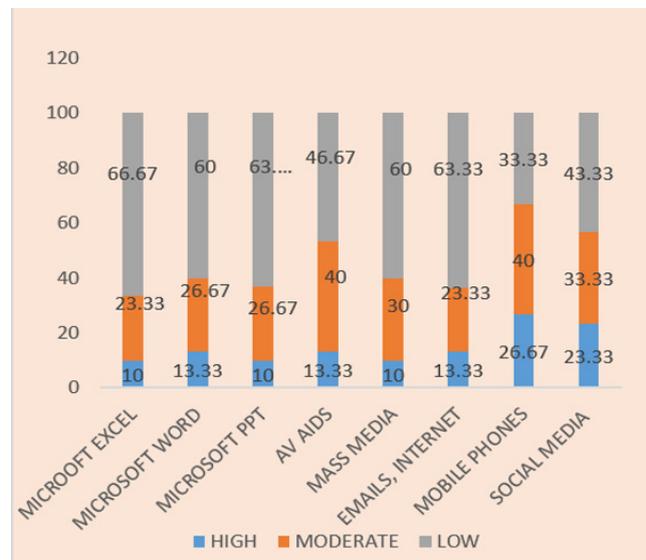


**Fig. 15 (b):** Importance of information and technology competencies (Para-Vets)

hospital is going to develop android application in order to have better connectivity with farmers. Tamizhkumaran and Natchimuthu (2014) also reported the use of the mobile phones by field veterinarians for delivery of livestock services.



**Fig.15 (c):** Knowledge level regarding informational and technological competencies (Veterinarians)



**Fig. 15 (d):** Knowledge level regarding informational and technological competencies (Veterinarians)

Knowledge level and skill of majority of Para-vets was low regarding Microsoft excel, Microsoft word, Microsoft power point, Mass media, emails and internet and social media as indicated in Fig.15 (d). Majority of the para- vets are not having professional dealings with these technologies directly. The lagging behind reasons can be that majority of them are having low qualification ,engaged in assisting the veterinarians and doing field level treatments, less hunt for latest knowledge and not

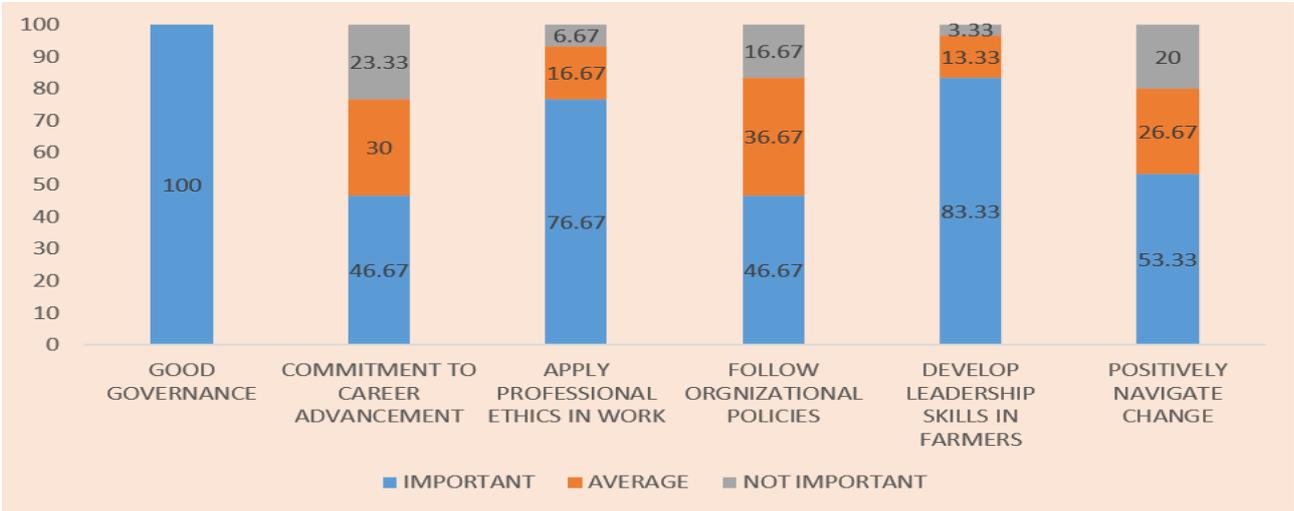
any exposure through monthly meetings to these type of competencies. Para-vets believe that their major work is administration of treatment, maintaining records, assisting veterinarians. Although the field veterinarians have high skill in using the social media and mobile phones for the delivery of the livestock services but full potential of mobile phones in extension communication is yet to be realized due to lack of involvement of all stake holders, lack of knowledge, skill and accessibility of these technologies to stakeholders especially farmers.

Among various ICT tools, mobile phone has emerged as one of the widely accepted and adopted instruments to ease the information communication process among farming communities, lowering transaction costs and raising the income levels of farmers (Hayrol et al., 2009; Mittal et al., 2010; Mittal and Tripathi, 2009; Inigo et al., 2014; Rathod et al., 2016).

**9. Professional and leadership competencies**

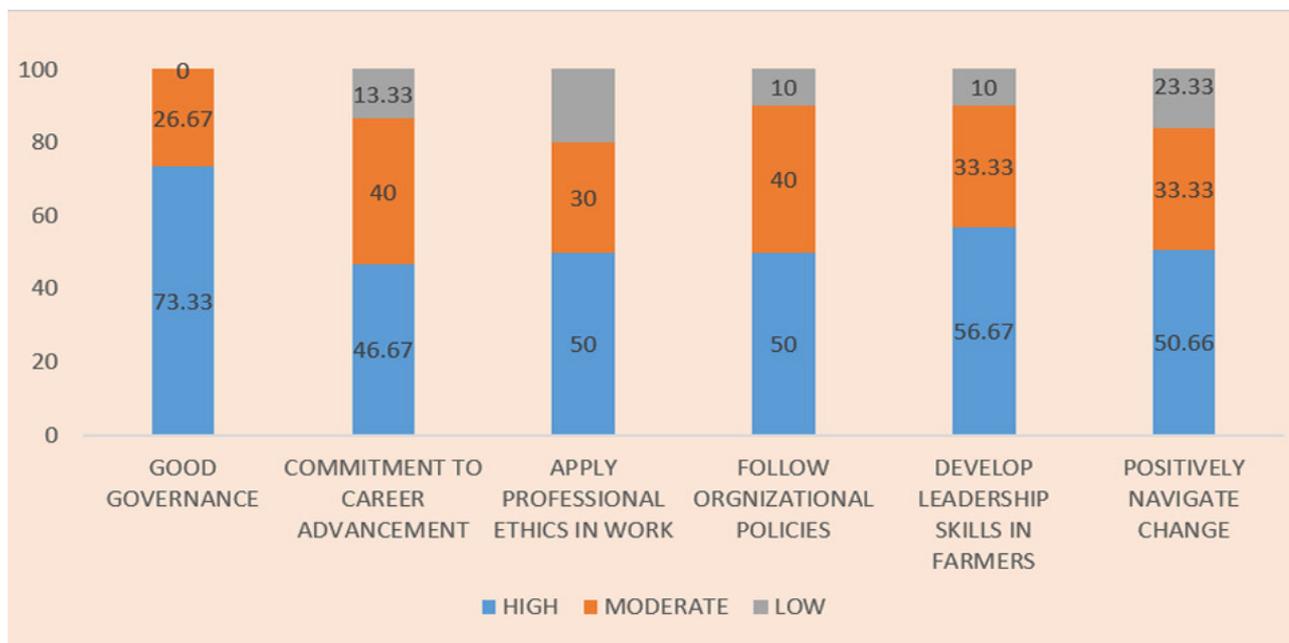


**Fig.16 (a):** Importance professional and leadership competencies (Veterinarians)

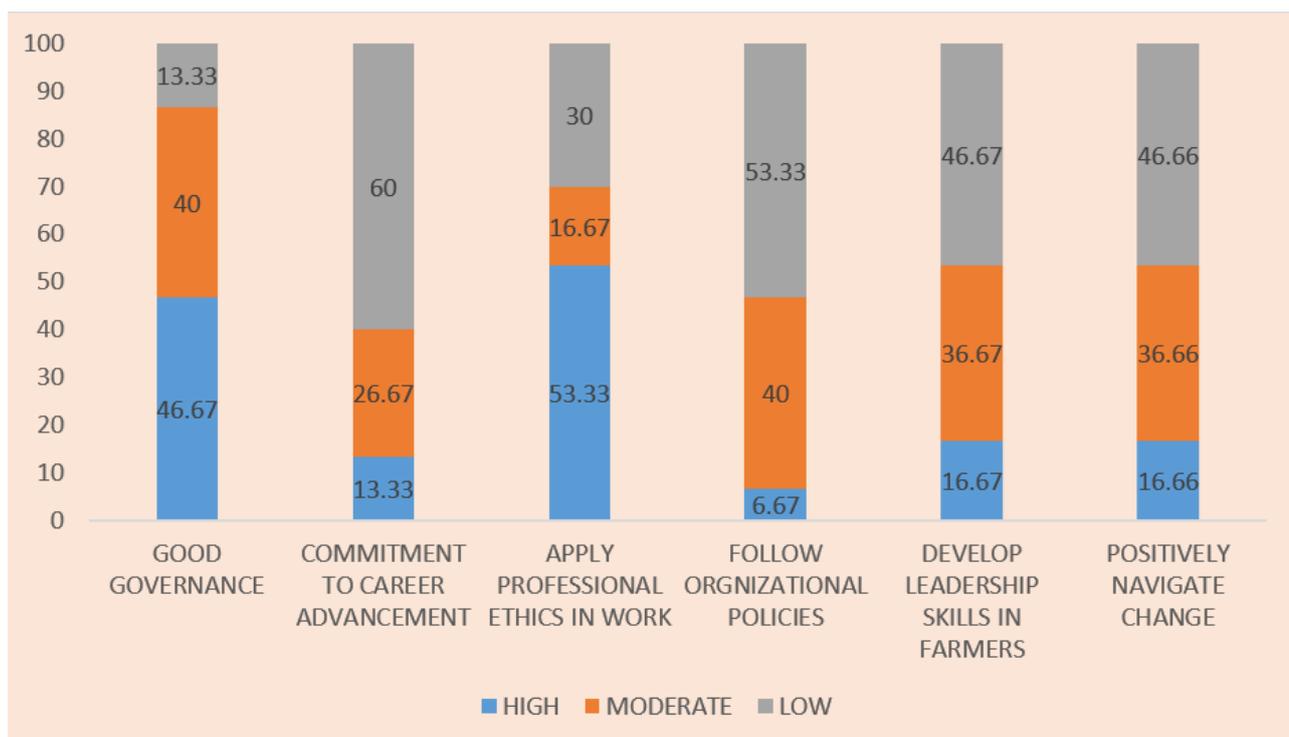


**Fig.16 (b):** Importance professional and leadership competencies ( Para-Vets)

Veterinarians perceived all the professional and leadership competencies as important while as the knowledge and skill of the same was lower than perceived importance as shown in Fig.16(a) and Fig.16(c). The results here suggest that there is need of looking more keenly towards the professional development of the veterinarians. Need for highly specialized in-service trainings for the professionals so that they can acquire higher competencies. As reported by Davis, 2015 field workers must maintain ethical standards of the profession, value the principles of honesty, respect for the local culture, accountability, inclusion, transparency and integrity.



**Fig.16 (c):** Knowledge level regarding professional and leadership competencies (Veterinarians)



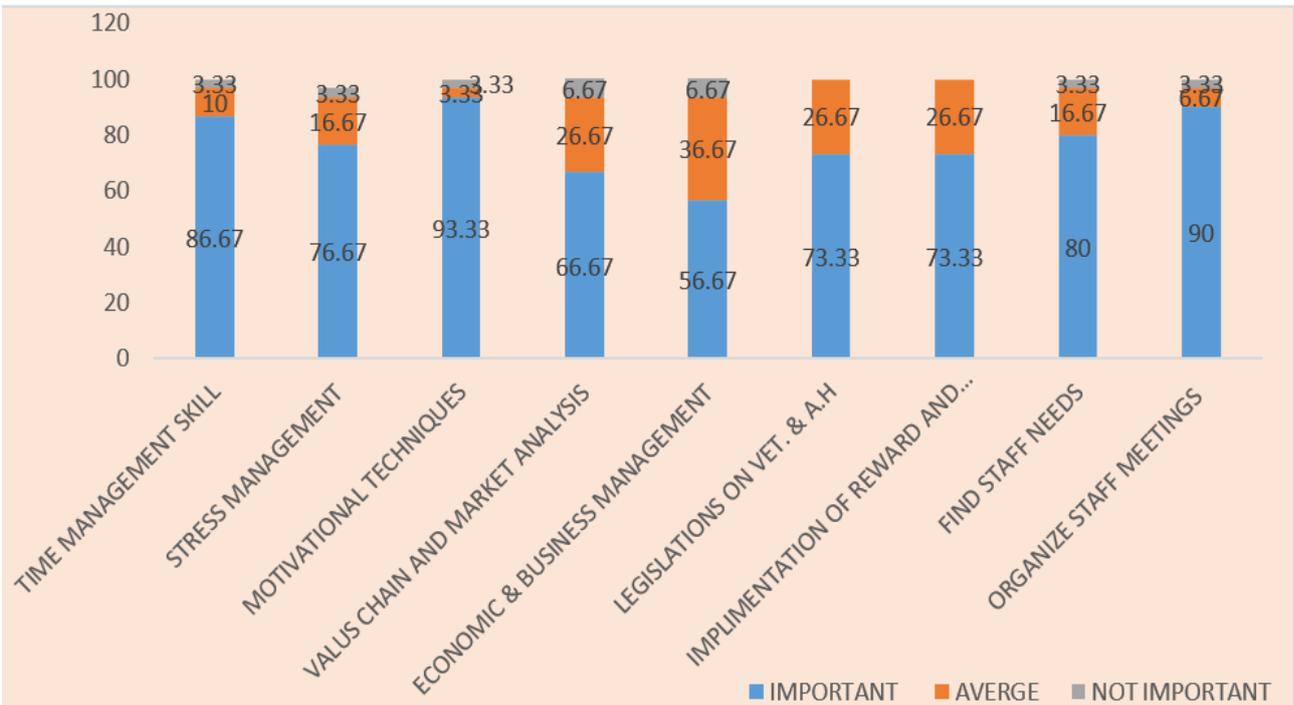
**Fig.16 (d):** Knowledge level regarding professional and leadership competencies (Para-Vets)

Huge majority of para-vets considered good governance (100%), applying professional ethics (76.67%) and development of leadership skills (83.33%) as important and a less majority than this considered other three competencies as important (Fig. 16(b)). Knowledge level of majority of the para-vets is low about most of these competencies (Fig.16(d)).

There is a huge gap between importance and the perceived knowledge regarding the same.

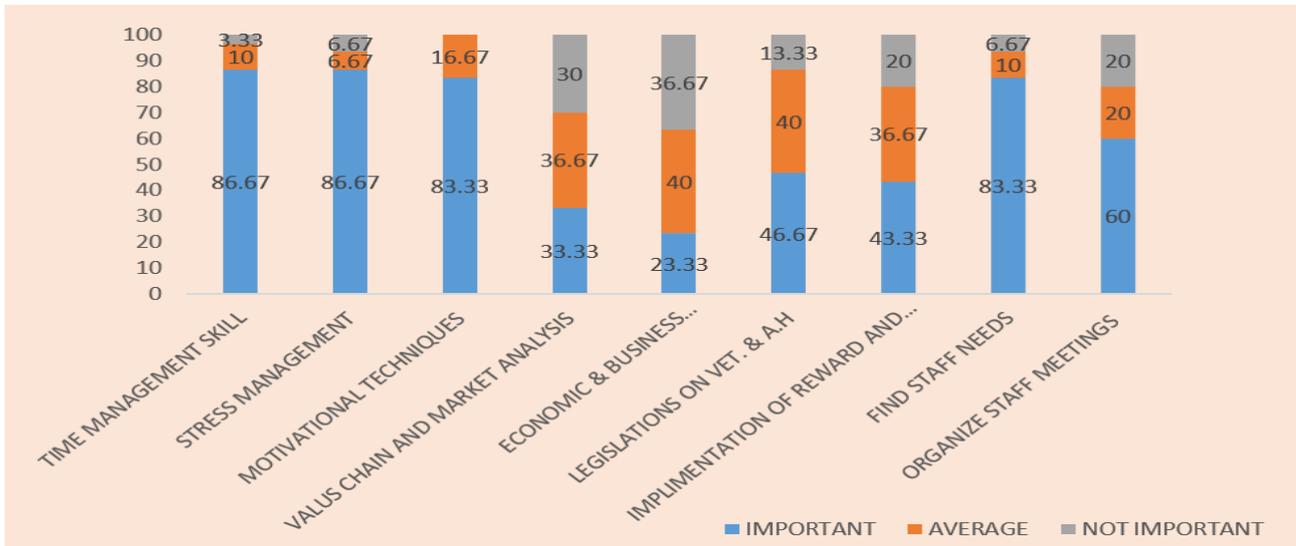
Para-vets are having low knowledge about commitment to carrier development, to follow organizational policies, develop leadership and positively navigate change (Fig.16(d)). Para-vets are important part of veterinary extension system and have eventually more public dealings. They are considered as personal cosmopolites, credible and faithful by farmers so are more comfortable in communicating with them.. Para –vets are essential stakeholders in livestock extension system par-vets can be effective change agents if having the good professional and developmental skills, career advancement skills etc.

**10. Organizational and management competencies**

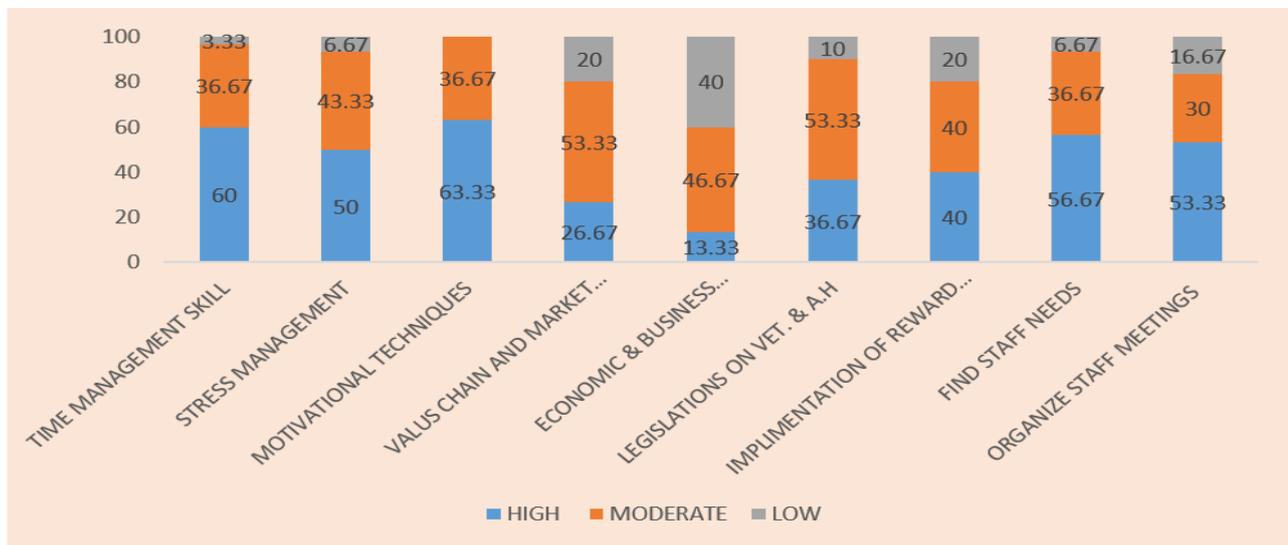


**Fig. 17 (a):** Importance of organizational and management competencies (Veterinary)

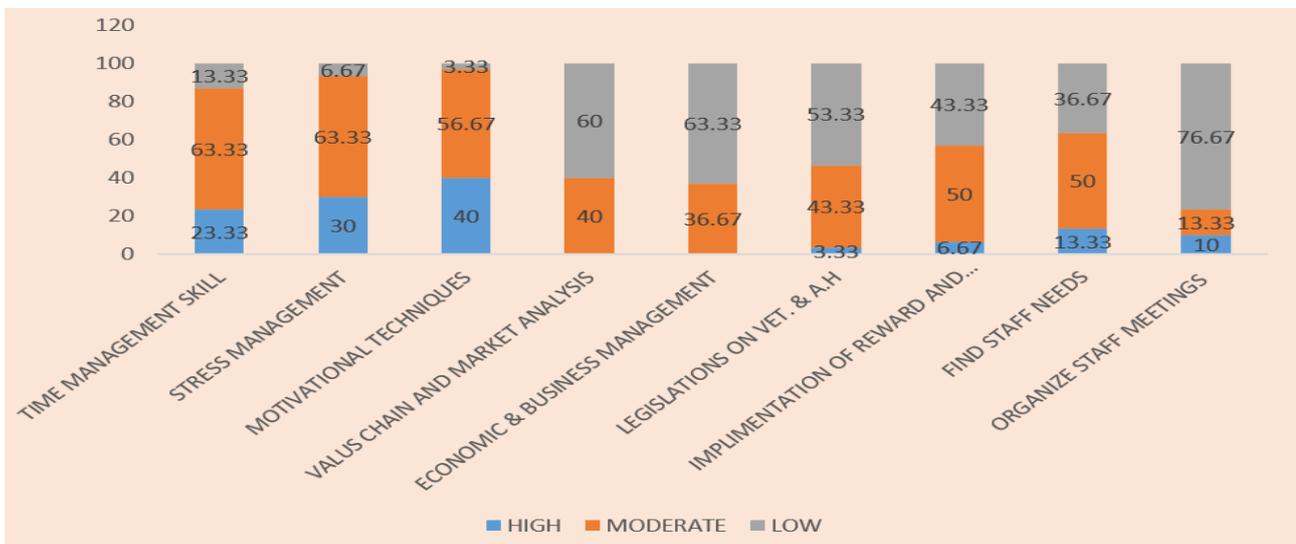
Time and management, stress management, motivational techniques , finding staff needs and organizing staff meetings in timely manner are considered important by the majority of the veterinarians and competencies regarding value chain anlysis and economic and business mangment competencies are considered important by comparatevely less number of veterinarians (Fig.17 (a)). The gap between the importance of these competencies and the current knowledge and skill is high (Fig.17 (c)).



**Fig. 17(b):** Importance of organizational and management competencies (Para-Vets)



**Fig.17 (c):** Knowledge level about organizational and management competencies (Veterinarians)



**Fig. 17 (d):** Knowledge level about organizational and management competencies (Para-Vets)

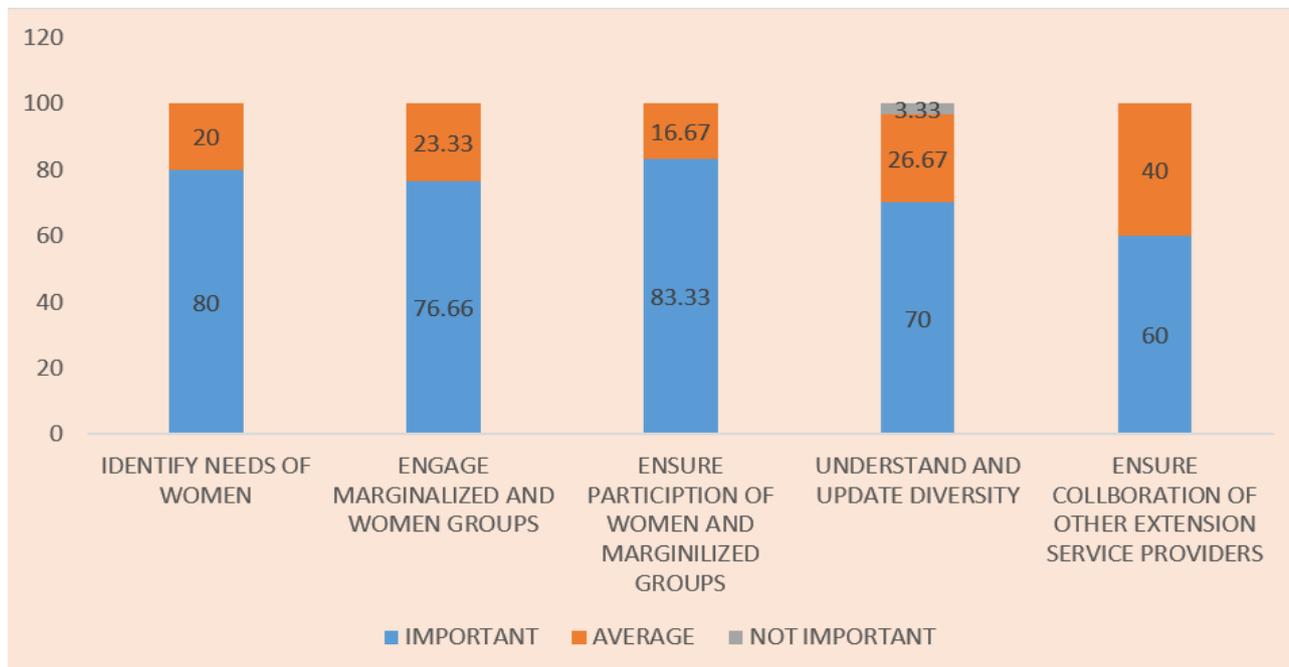
The importance and knowledge level about these competencies follow the same pattern in para-vets except that para-vets are comparatively less competent and consider these competencies less important than the veterinarians. Majority of para-vets are having low competencies regarding value chain and market analysis (60%), economic and business management (63.33%) and organizing staff meetings in a timely manner (76.67%) as shown in Fig.17(c). The para-vets considered these competencies outside the domain of their job. Basic knowledge and skill regarding these competencies should be there in order to guide the livestock farmers in areas where the presence of veterinarian is only occasional.

The issues regarding the value chain analysis and economic and business management are not taken by the field extension functionaries (veterinarians and para-vets). Providing this information is restricted only to few extension development officers, KVK persons and entrepreneurship development officers (EDI). The livestock extension professionals consider these competencies as less important for them hence having less skills. Farmers are in dire need of information regarding the technologies, access to materials and markets and reach out to them is the role of extension professional. Extension agents must be able and willing to work with farmers to transform the agriculture sector positively and sustainably (Suvedi and Kaplowitz, 2016). As livestock extension professionals are working at the grass root level with farmers they are more aware about need and socio-economic conditions of the localities. Their involvement is must to assess the value chains and to define the new business opportunities for the livestock farmers. Presence of veterinarian should be considered necessarily in dairy and meat value chain analysis. There is need for skill development through trainings, workshops, seminars, field visits and study tours to other states so there can develop better understanding about importance of these skills. The veterinary professional graduates should necessarily be given sensitization during their pre-service trainings regarding the value chain analysis, livestock business development and entrepreneurship development. The dealing of the veterinary extension professionals is mainly with the marginal to small farmers who are almost entirely dependent on their livestock for livelihood. Here it becomes responsibility of the professionals to help the farmers to reap maximum benefits in order to improve their socio-economic conditions. Qamar (2005) stated that extension workers work in harsh field conditions with limited facilities and less than well-educated clients. Only trained motivated and competent staff members can work and succeed in such difficult conditions.

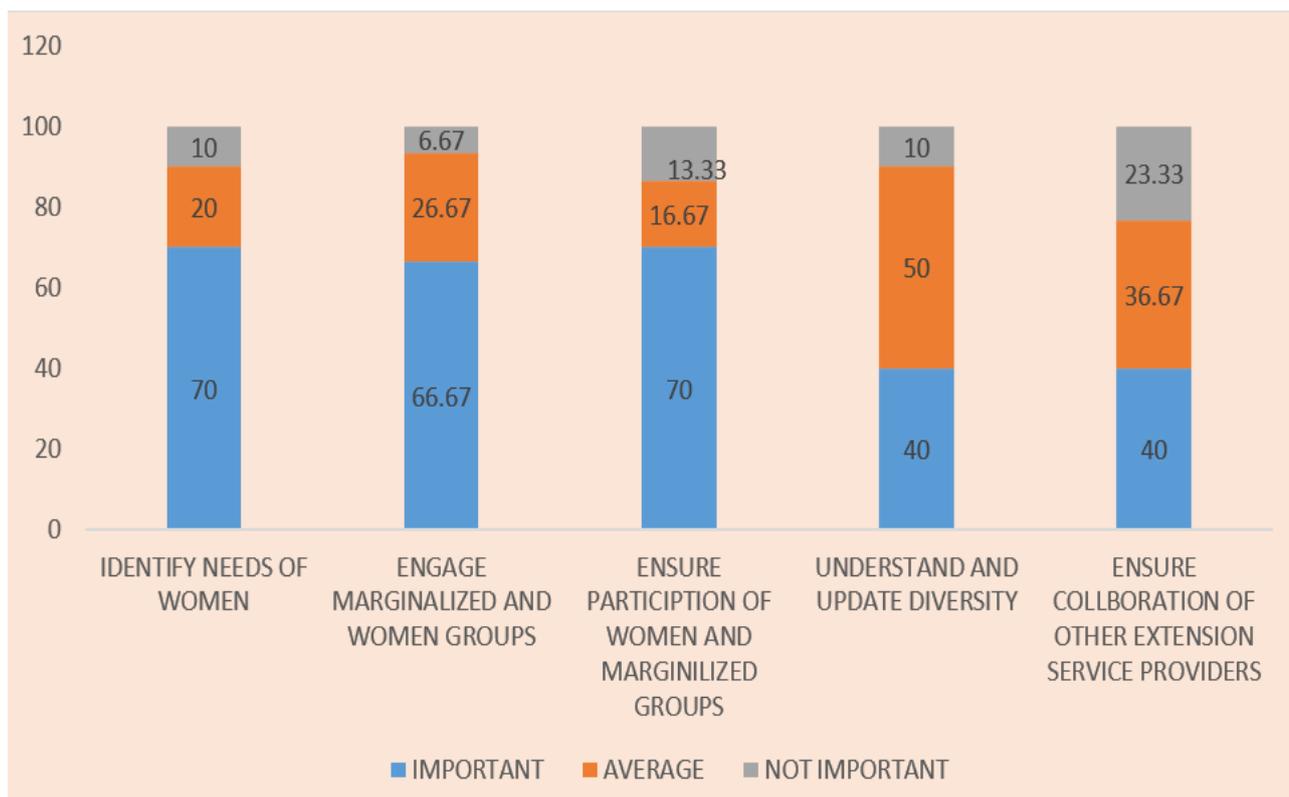
## **11. Diversity competencies**

Diversity competencies are considered important by the majority of the veterinarians. In case of para-veterinarians (Fig.18(a)) competencies regarding identifying needs of the women, engaging marginalized women groups, ensure participation of women and marginalized groups are considered as important by majority. Competencies with regard to understand and update diversity and to ensure collaboration of other extension service providers is considered as average to not important by maximum para-vets. There is a gap between the perception of veterinarians and para-vets regarding importance of these competencies due to different angle of knowing and understanding by them. Livestock extension professionals (Veterinarians and Para-vets) have low knowledge and

skill to perform the diversity competencies although the skill of the veterinarians is higher than that of the para-veterinarians. The skills of the veterinarians range between high to moderate (Fig.18(c) while as skills of the para-vets range between moderate to low (Fig. 18(d). Among the all five diversity competencies, skill regarding the updating diversity and to ensure collaboration with other extension service providers was lowest.



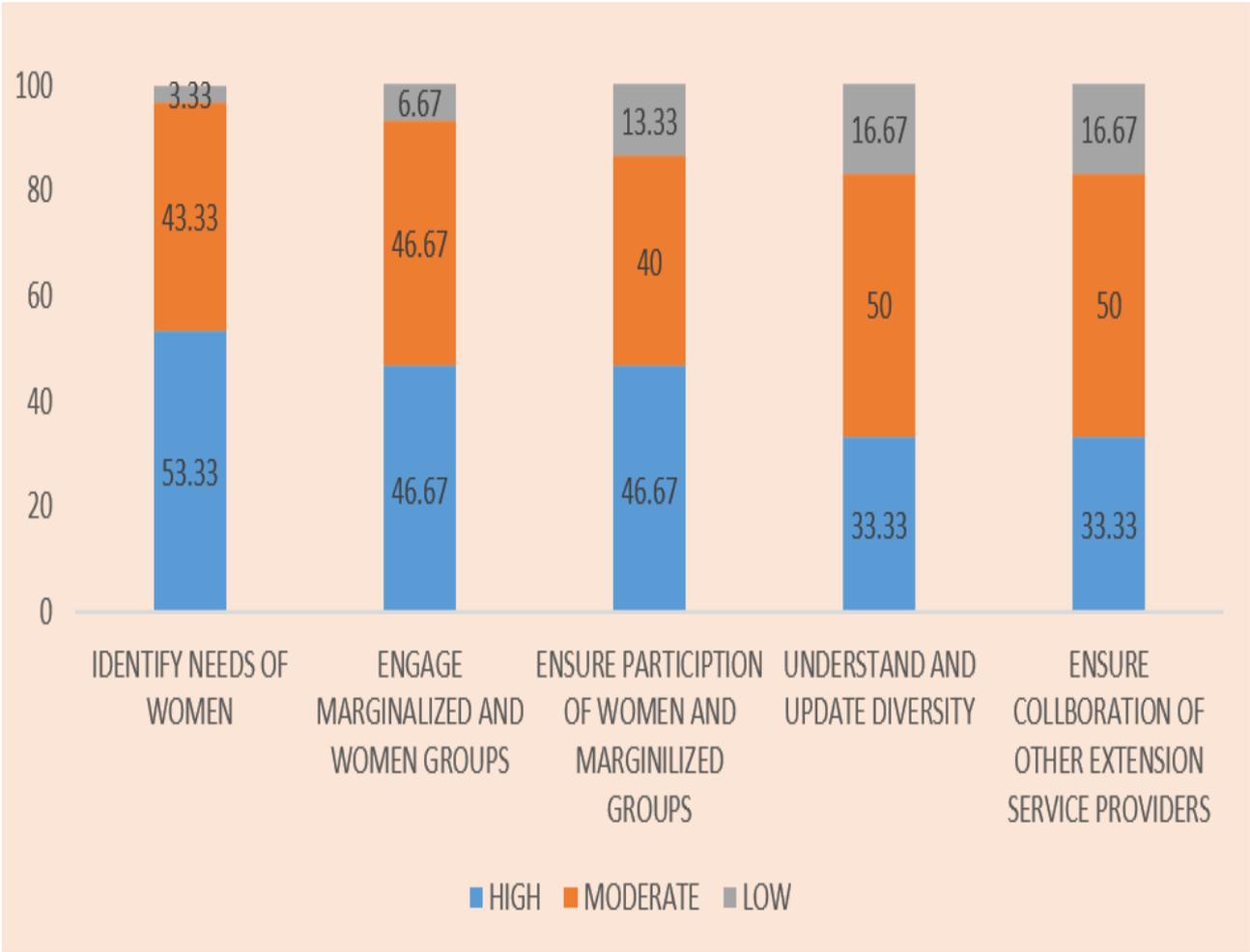
**Fig 18 (a):** Importance of diversity competencies (Veterinarians)



**Fig.18(b):** Importance of diversity competencies (Para-Vets)

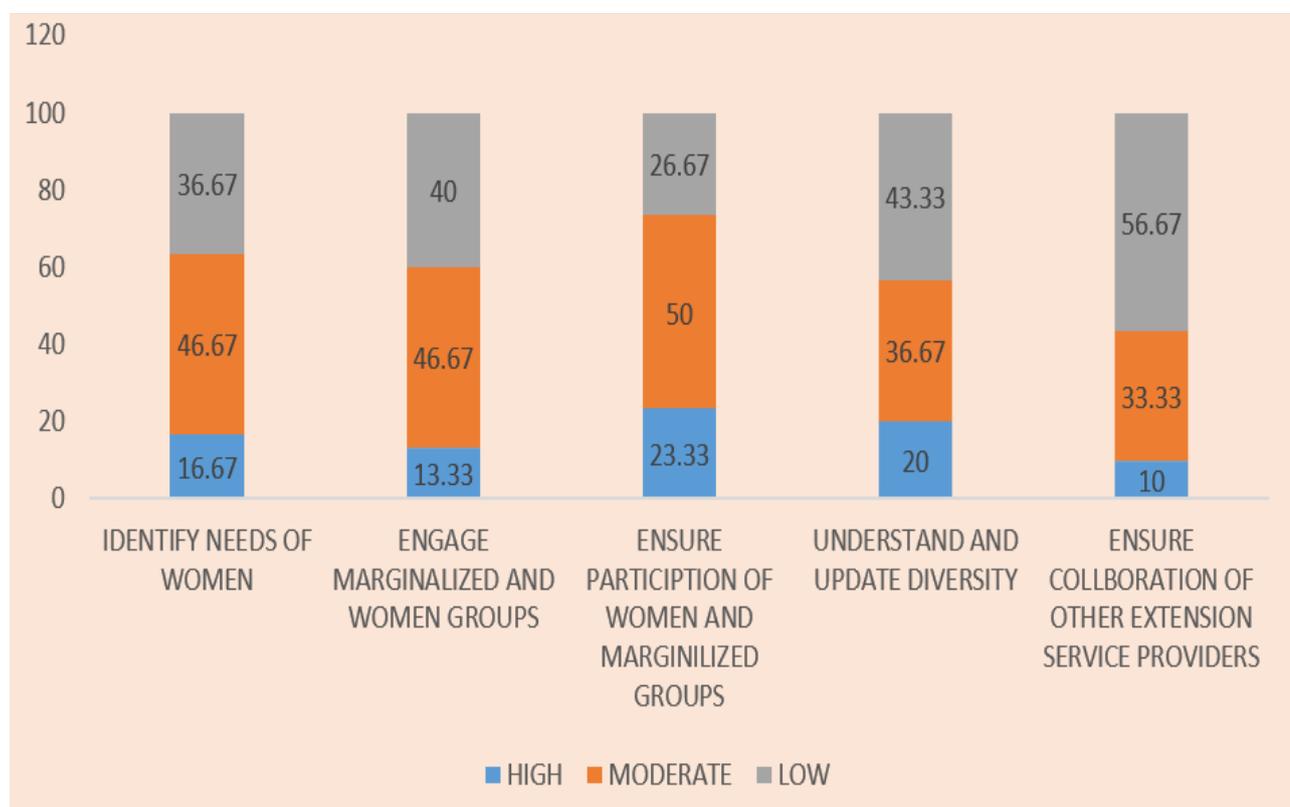
Considering the figures related to importance and knowledge of diversity competencies there is gap between how much important they are considered and what is the actual skill to perform these activities among both veterinarians and the para-vets.

The dealing or interactions of livestock professionals are mainly with male members of family regardless of the fact that livestock is mainly taken care and reared by the women flock. Due to some cultural norms, religious issues the women flock are less able to talk freely and interact with extension professionals. The women are mostly reluctant to participate in extension programmes and shy to express their views freely. Compared to urban women, rural women are mostly engaged in their house hold chores, lack confidence and are less educated to understand benefits of scientific and updated technologies. Women are having more understanding of animals and their problems being more close to them but the decision making power resides with the men. To ensure these activities in the society engagement of professionals has to be more with people of different tribes and castes especially with women. The women professionals and the para-professionals can help to solve this problem in better way. If we see in the basic profile of the respondents in Table 1 93.33 percent professionals working as field extension workers are the males. There is need to engage more women extension professionals at the ground level in order to have the better understanding of the problems of women farmers.



**Fig.18(c):** Knowledge level about diversity competencies (Veterinarians)

Veterinarians and the para-vets should be given trainings and exposure how to develop rapport with their clients in order to ensure engagement of all sectors of society that form important part of farming community. As proposed by Ghimire (2016) that changing demography of farming communities, advancing technologies, increase in competition for resources and increase in globalization warrant a shift in the extension paradigm to a demand-driven, participatory and pluralistic form. The shift in extension paradigm requires extension human resources, such as extension professionals, to be competent in both process and technical skills, so they help farming communities develop themselves. As reported by Suvedi and Kaplowitz (2016) that respecting the tradition, appreciating the cultural specificities within a community, spending time with people to win their trust and clear doubts about your role are important for building rapport and bringing change in the diverse communities and for building diversity competencies.



**Fig.18 (d):** Knowledge level about diversity competencies (Para-vets)

The knowledge and the skill to ensure that other service providers are collaborating in providing the extension activities are poor in the extension professionals. Linkages of the professionals with the NGO'S, EDI personals etc. are very poor. There can be either less presence of these agencies at the ground level or less collaboration between the animal husbandry departments and the service providers. If these agencies are present then the reach out to these agencies should be ensured in order to get better insight into problems of livestock owners and hence their participation and development. To strengthen extension services, there is need for improving effectiveness in supply and diffusion of agricultural technologies, changing institutional structures, and increasing collaboration and cooperation between the public and private sectors (OECD, 2012).

## 12. Appropriate ways to acquire the core competencies in livestock extension professionals

Majority of the respondents (58.33%) strongly agreed that core competencies can be improved through preservice training. Pre –service training is the basic point to get into the veterinary extension profession but more attention during this training is given to the theoretical portion than the practical assignments. The improvement in curriculum of pre-service training, involvement of more practical part or a logical balance between practical and theory can provide tremendous benefits to the professionals in future job activities. The students should be at least sensitized to village level environments, how to deal with clients, how to approach complicated cases etc. These basic things should be included more in the pre-service trainings.

Majority of respondents (48.33%) agreed to some extent that there should be assessment of the professionals before the certification. There should be rigorous assessment of the professionals before providing them certification because their abilities and competencies are crucial for deciding the future of livestock extension profession. But there are lot of competencies that are learned only after experience that point also need to be also kept in mind at time of assessment for certification.

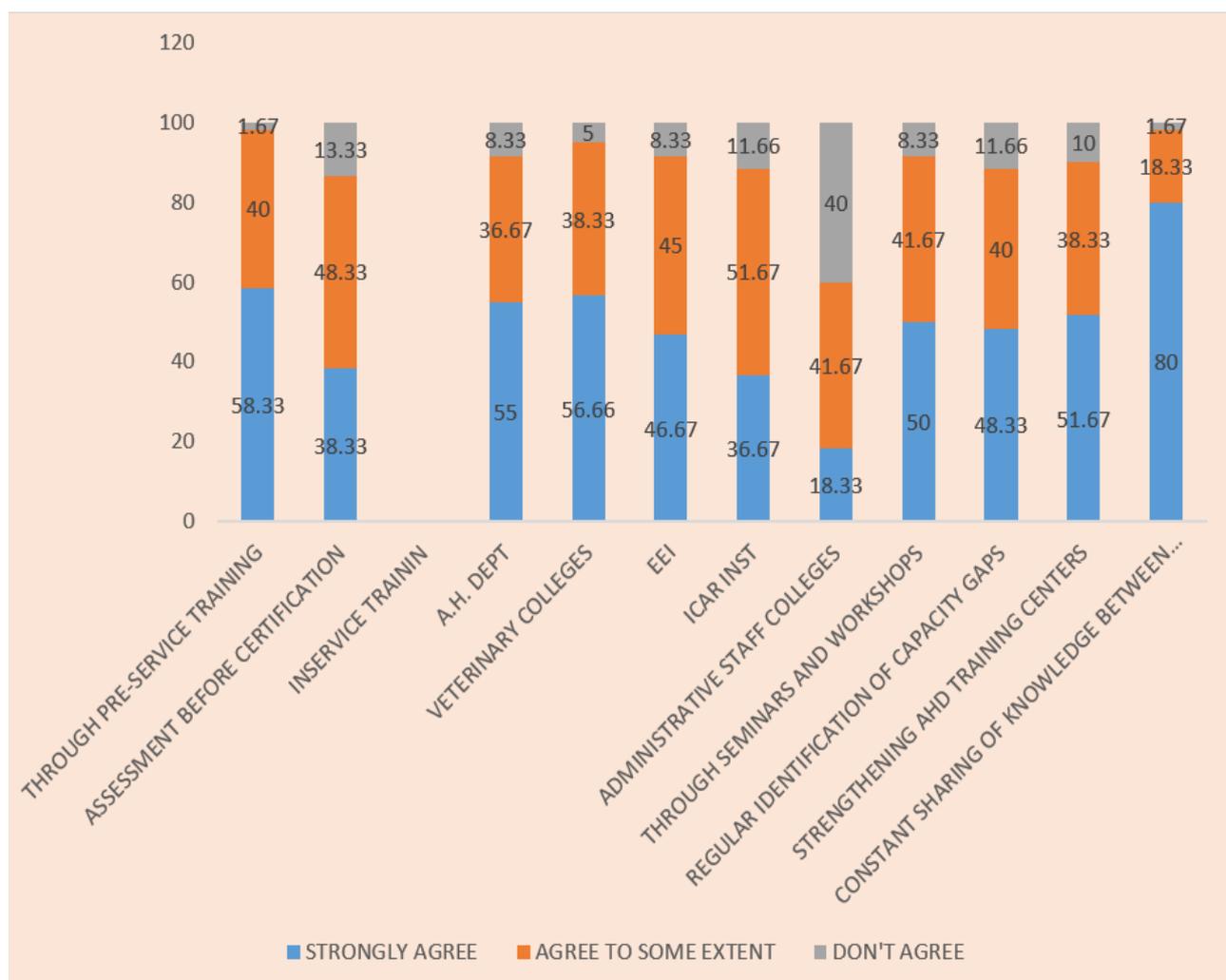


Fig.19: Appropriate ways to acquire core competencies

Majority of respondents strongly agreed that the competencies can be acquired through in-service training in animal husbandry departments, veterinary colleges and extension education institutes (Fig.19). The livestock extension professionals should get regular trainings through the Animal Husbandry departments and veterinary colleges. The AHD (Animal Husbandry Departments) can be a good platform to share the experiences, know how about recent happenings and challenges in the field. The training in the veterinary colleges can prove highly useful for getting in touch with research findings in these institutes and disseminating them to farmers. Livestock professionals can also share the latest challenges faced at field level on which there is need of more research. This way the competencies of the professionals will improve along with the dissemination of new findings to farmers. This will also help to develop strong linkage between different agencies to meet new challenges.

50 percent of the respondents strongly agreed that competencies can be increased through basic induction training by conducting international seminars, national workshops, webinars etc. Participation in these programmes can expose livestock extension professionals to latest world happenings in livestock research and development. Here they can get interactions with highly experienced, with higher officials, scientists and can also share their work experiences.

43.33 percent and 40 percent of the respondents agree strongly and to some extent respectively that there should be the regular identification of the capacity gaps in the livestock extension departments, in the dissemination of technology, in organizing trainings and participation of the respondents.

Majority of the extension professionals strongly agree that strengthening of the training centres is very important. The centres where trainings are given should be well equipped with the latest facilities, audio-visual aids, provision of the latest ICT's like video conferences, skype facilities so that trainees get more interested and constraint of the distance gets solved. If training centres are equipped with latest technologies then interactions with the experts will be possible who are not otherwise able to get face to face contacted. The physical facilities of a training centre decide much how efficient learning can take place. As reported by Prasad et al. (2015) that training infrastructure for livestock extension is considerably weak. Extension professionals in many developing countries are trained in traditional education system (ADB, 2012; Belay and Abebaw, 2004; FAO, 2010), and little is known about how able and competent those extension professionals are in serving their clients in changing contexts.

As per the recommendations of the Planning commission of India (2012b) emphasis given on the re-training of the field veterinarians to brace them for recent developments and they have to attend mandatory refresher course every 5 years during their career.

Livestock extension professionals strongly agree that constant sharing of knowledge and experience between researchers and extension professionals can help greatly to increase the competencies of the professionals. The research institutes are engaged in doing research and developing new technology. But only technology that is developed keeping in consideration about local conditions and local needs remains successful. Suvedi et al. (2015) proposed that extension professionals work as liaisons between

research and grass-roots extension workers, between researchers and farmers, and between central agricultural authority and grass-roots workers. There should be constant interactions between the researchers and extension professionals regarding recent problems in field, recent strains of diseases that are emerging as new challenges and need research attention. The vaccines once developed for one strain of the virus can't be used after decades when new strain of virus can be the reason for the disease. If there is ineffectiveness in current treatments and vaccines that should remind us that there is need of the research in the area. The current challenges can only be solved when there is better collaboration and coordination between the field and research labs. This will help in increasing the livestock service competencies, risk analysis competencies and programme planning competencies.

## Conclusion

The findings of the study indicates that livestock extension departments, their contacts, linkages, facilities etc. are not on par with the current need of the livestock owners. There is urgent need to improve the contacts of the livestock extension professionals with other extension agencies that will lead to better understanding and the better solutions to the field problems.

The flow of information between the line departments is low which leads to the message breakdown. Due to less information flow there is less awareness and knowledge about the various happenings of the field. Frequent and there should be engagement of the par-vets also in the information sharing to respect and evaluate their point of view in the programmes.

The linkages of the livestock extension with the KVKs, research institutes, dairy cooperatives etc. should be on regular basis. The linkages between the all stake holders of the profession need necessarily to be improved. The research to field linkage is the life line of extension work that needs due consideration and attention. Most importantly there should be strengthening of the linkage of the para-professionals with the higher officials of the department especially VAS to whom they are directly concerned.

The findings of the current study revealed that the current knowledge and skill of the livestock extension professionals is not adequate. There is a big gap between the perceived importance and current level of knowledge. The skills and the Knowledge that these professionals considered as important part of the professional life is not ample that becomes hindrance in effective delivery of services. The livestock professionals from the graduation level should be made enough competent to impart required skills in them. The curriculum mismatch at the graduation level. There is low level of knowledge of extension professionals (both veterinarians and para-vets) regarding the extension related competencies, livestock service and welfare, risk analysis, technical subject related, programme planning, information and technology, professional and leadership, organizational and management and diversity competencies. This leads to conclude that in current age of challenges and competition there is need to be provide regular and quality trainings regarding the areas of need for efficient performing of the job. The trainings should be conducted separately for the veterinarians and the para-vets according to their need and level of knowledge and understanding. The professionals should be sensitized regularly about the happenings in the livestock sector, challenges and opportunities all over the world. The participation of the professionals should be ensured in the national and international seminars the professionals are not competent to perform their job with their current requirement in field. There is need of trainings both In-service.

The result demonstration, campaign and survey, audio-visual aids are important tools in hands of the professionals to spread awareness and disseminate information. There is need of more pre-service and in-service training for the livestock extension professionals to impart the necessary information and skills in them. With the current age of emerging and re-emerging zoonotic diseases there is

much need for the risk analysis, for understanding the new technological tools, understand and respect and implement the new national and international regulations in treatment of animals and in import and export systems.

As Suvedi and Kaplowitz (2016) in their book on core competencies described the key roles and responsibilities of the extension workers as:

- Disseminate new research based knowledge through training and demonstration
- Develop networks with the local organizations, ensuring coordination of services and promoting collaboration with developmental partners.
- Organizing producers into groups and associations
- Linking farmers to markets-identifying opportunities and conducting market analysis
- Facilitating access to credit and input supply
- Supporting market and value chain development for farm products
- Conveying innovation platforms to facilitate knowledge and management
- Promoting gender equality and engaging various marginalized groups in extension programmes
- Supporting adaptation to climate change
- Organizing participatory, demand driven programme planning for extension
- Implementing collaborative and pluralistic delivery of extension services
- Evaluating local extension programs to report progress and document impacts.

But majority of these roles are neglected or less delivered at the ground level by the extension professionals due to lack of knowledge and skill. These competencies are very crucial for any type of change and the development in the society. There is an immediate need of flux towards the approach of the state towards the demands of the society and what we provide. The need of the competent professionals and hence their production and training lies with the agricultural universities at the initial date and the issues of lacking competencies in the livestock extension professionals for effect.

Improvement of the extension contacts and linkages: From the present study it was revealed that there lack of linkages and contacts of the livestock extension professionals with other extension providing agencies. This lack of linkage and collaboration leads to gap in understanding and solving the problems in efficient way. Collaboration between all the relevant agencies need to be improved as everyone see and understands the problems from different perspective and vision. This sharing of the vision and experience can help the livestock extension professionals to become more competent and efficient in delivery of their services. The contacts or the frequency of the meetings should be increased. There should be separate calendars for meeting with the para-veterinarians so that all experiences are pooled and utilized in a better way. The work that is done on individual basis by different agencies does not give so much success at given when done with collaboration.

Furtherance of infrastructure in livestock health centers: The livestock health centers are mainly located in the far areas in a community. The lack of basic facilities renders the professionals helpless in time of the emergencies and they have to give their services in harsh conditions. Lack of the infrastructure and disease diagnosis at the local conditions leads to the late diagnosis of diseases and loss of animals and sometimes a cause for spread of the diseases to whole locality. There should be availability of the tools and infrastructure needed by the professionals needed in day to day service. The health centers should have the facilities like supply of electricity, adequate and quality medicines, extension literature, presence of diagnostic chemicals etc. which majority of the health centers are lacking. The infrastructure of these centers is needed to be upgraded from point of effective delivery of services, effective dissemination of the technology and to keep the professionals motivated and to build the rapport with the farming community. Major constraints in livestock breeding service delivery are the unavailability of the information booklets, unawareness about extension activities and lack of training programmes (Rathod et. al., 2012).

Modify the curricula of pre-service training for veterinarians: The current study curriculum in the veterinary colleges is more theory centric than the concentration towards the practical components. The budding veterinarians at graduation level should be sensitized toward the field conditions, current global changes and challenges in the livestock production. There should be a high balance between the theoretical and the practical part of the degree by making the curriculum more demand driven. As the present curriculum fails to inculcate skills required for analyzing complex social realities and developmental processes. The students should be trained to face the current challenges and should be made enough competent to handle them. There should be more provision of the clinical camps during undergraduate courses in far areas of the society where the need of the farmers are entirely different than the framers seen near research institutes. In this way the students can understand the needs and challenges at different places and different types of the livestock farmers. This will also help them to work with diversity of people in their job tenure. All veterinarians, regardless of their professional area of practice after graduation, are responsible for promoting animal health, animal welfare, veterinary public health and food safety. So on document of the Competencies of the day 1 graduates by OIE (2016) has stated that veterinary graduates after graduating should have general

awareness and appreciation for:

- Good practices in administration and management;
- The importance of excellent interpersonal communication skills,
- To include self-knowledge and knowledge of others;
- The importance of effective communication (public awareness and advocacy);
- Where to find up-to-date and reliable information should detailed knowledge be needed or desired;
- How risk analysis can be applied to assessment of risk of animal disease and residues of veterinary drugs, including importation of animals and animal products and other related veterinary services activities;
- How risk analysis can be used to ensure veterinary services adequately protect animal and human health;
- Where to find up-to-date and reliable information should deeper knowledge be needed or desired (e.g. the OIE Handbook on Import Risk Analysis)

Impart in-service trainings to the livestock extension professionals: The in-service trainings are the important and effective tools to improve the competencies of the professionals who are in their jobs and are not current with the required competencies. Regular training and re-training programmes must be organized for livestock extension officers and agents in order to enhance their competencies, especially in identified core areas. Training needs exist at all levels of the veterinarians to Para-vets. There is need of both long term and short term trainings. While the former is for improving the professional skills of the staff the latter is largely focused in ensuring that the needed knowledge and practical skills to handle planned project interventions are in place. Though the country has several agencies involved in training of extension personnel, most of their focus has been on crop extension and training infrastructure for livestock extension is considerably weak (Prasad et al., 2015). The special focus should be given towards the improvement of the livestock training centres at the state and national level. The training centres should have the infrastructure mainly focused towards the need of the livestock professionals. There is the need to update or equip the existing training centres with the current tools and technology. Rebuilt capacities are required by the extension professionals to provide services that are needed to enhance the capacity of livestock producers to exploit the full potential of livestock production. These include health and production services and other market services such as credit, livestock insurance and delivery of market information and output marketing and capacity building (Ahuja and Redmond, 2004). Short in-service courses for the para-vets: Para-vets are one of the most promising avenues for increasing the provision of animal health services in the rural areas of many developing countries (Holden et al 1996). But competencies of para-vets are not current with the required challenges in the field. Para-vets being from the different study back grounds have low knowledge and skill of the livestock competencies. Short study courses can be

conducted for the para-vets where they can get knowledge and understand about the basics of the profession. How to handle the animals, diagnostic tools, search for knowledge, approach in case of emergencies etc. They should be sensitized about their role in extension and training, animal welfare, and disease prevention and control.

Intensify the number of female extension professionals: The livestock extension professionals are working with the all types of the communities and tribes. Due to some cultural or the religious taboos they are not freely able to engage in discussions with the women farmers. This factor leads to the less participation and involvement of the women hence render professionals less efficient in diversity competencies. The presence of the female field extension workers can solve this problem as they can freely engage women with discussions and can have better understanding of the need and ground problems. More Extension personnel should be employed to complement existing ones. Specifically, adequate livestock extension agents and subject matter specialists need to be provided for the operational zones of public extension service agencies.

### **Improve the number of the Veterinarians and para-vets in field level**

The extension professionals working in the field are far less than their required number. The short comings in competencies is further worsened by the less availability of the livestock extension professionals. Majority of the areas in the villages are handled by a single veterinarian who is not able to reach all the clients.

## References

- Adisa, R. S. (2015). Livestock extension practice and competency among agricultural extension agents in North-Central Nigeria South African. *Journal of Agricultural Extension*. 43 (1):12 – 21.
- Ahuja, V. and E. Redmond (2004). Livestock Services and the poor. *Tropical Animal health and Production*, Vol. 36: 247-268.
- Ahuja, V., George, P.S., Ray, S., McConnell, K., Kurup, M.P.G., Gandhi, V., Umali-Deininger, D. and de Haan, C. (2000). *Agricultural services and the poor: Case of livestock health and breeding services in India*. Ahmadabad, India: Indian Institute of Management.
- Ahuja, V., Rajasekhar, M. and Haju, R. (2008). *Animal health for poverty alleviation: A review of key issues for India*. Background paper prepared for livestock sector review of the World Bank.
- Alex, G., W. Zijp and D. Byerlee. (2002). *Rural Extension and Advisory Services: New Directions, Rural Development Strategy Background Paper # 9, ARD.* , Washington, D.C.: The World Bank.
- Anderson, J. R. and Feder, G. (2003). *Rural Extension Services*. Agriculture and Rural Development Department and Development Research Group Rural Development. The World Bank.
- Balaguru, T. and Rajagopalan, M. (1986). Management of agricultural research projects in India. Part 2: Research productivity reporting and communication. *Agricultural Administration*, Vol. 23(1):1-15. Doi: 10.1016/0309-586X (86)90109-3
- Bardhana, D. Kumar, S and Rishi Kumar Singh. R.K. (2015). Delivery of Animal Healthcare Services in Uttar Pradesh: Present Status, Challenges and Opportunities. *Agricultural Economics Research Review*. Vol. 28: 127-136
- Chander M., Dutt T., Ravikumar R.K. & Subrahmanyeswari B. (2010). – Livestock technology transfer service in India: a review. *Indian J. Anim. Sci.*, Vol. 80 (11):1115–1125.
- Chipman, J. and Blum, F. (2016). Livestock services: Agricultural technology & service delivery in rural Tanzania. IGC (International Growth Centre) 20/6/2017. <http://www.theigc.org/blog/livestock-services-agricultural-technology-service-delivery-in-rural-tanzania>.
- Delgado, C., Rosegrant, M., Steinfeld, H., Ehui, S. and Courbois, C. (1999). *Livestock to 2020: The next food revolution*. IFPRI Food Agriculture and the Environment Discussion Paper 28. International Food Policy Research Institute, Washington, DC.
- Economic Times (2017). Fodder crisis. <https://economictimes.indiatimes.com/news/politics-and-nation/how-more-production-of-milkmay-help-clean-delhis-air-too/fodder-crisis/slide-show/61996367.cms>.

Eponou, T. (1993). Partners in agricultural technology: linking research and technology transfer to serve farmers. ISNAR Research Report No. 1. The Hague, Netherlands: International Service for National Agricultural Research, Erout, M. and Boulay, B. (2000). Developing the Attributes of Medical Professional Judgment and Competence", Post registration Medical and Dental Education Research Initiative of the Dept. of Health's Policy Research Program, University of Sussex, UK.

Extension Committee on Organization and Policy (ECOP). (2002). The extension system: A vision for the 21st century. Retrieved from [http://dasnr2.dasnr.okstate.edu/documents/committee\\_report.pdf](http://dasnr2.dasnr.okstate.edu/documents/committee_report.pdf)  
Food and Agricultural Organization (FAO) (2002). Improved animal health for poverty reduction and sustainable livelihoods. FAO Animal Production and Health paper 153

Gautam, M. (2000). Agricultural extension the Kenyan experience: an impact evaluation Washington DC, The World Bank.

Ghimire, R.P. (2016). Assessment of core competencies of agricultural extension professionals in Nepal. PhD thesis, Submitted to Michigan State University, Nepal.

Harder, A., Place, N. T. and Scheer, S. D. (2010). Towards a competency-based extension education curriculum: A Delphi study. *Journal of Agricultural Education*, 51(3):44-52.

Hay Group. (2003). Using competencies to identify higher performers: An overview of the basics. Philadelphia, PA: Hay Group.

Hegde, N.G. (2010). Mitigating global warming while providing sustainable livelihood through integrated farming systems: experiences of BAIF. In *Proceeding of International conference on global warming: Agriculture, sustainable development and public leadership*, 11–13 March, Ahmedabad, India: Indian Society for Community Education.

Khoury G. (2011). Extension Programmes. Conf. OIE (2011). Retrieved from <https://www.oie.int/doc/ged/D12815.PDF>

Kiara H., Odongo D., Karaimu P., Njiruand M. and Munene A. (2017). Delivery of animal health services in extensive livestock production systems. CGIAR, Report of a stakeholder workshop, Nairobi, 9-10 March 2017.

Liesse B.H., Sachadeva P.S. and Cochrane D.G. (1991). Organising and managing tropical disease control programmes. World Bank Technical Paper No. 101. World Bank, Washington, 123 pp  
Livestock Census. (2012). Nineteenth livestock census report. Ministry of Agriculture, Department of Animal Husbandry and Dairying, Krishi Bhawan, New Delhi. Available at: 34 (3) 13 No. 20112015-00072-EN13/22 [dahd.nic.in/dahd/WriteReadData/Livestock.pdf](http://dahd.nic.in/dahd/WriteReadData/Livestock.pdf).

Matthewman, R. and Ashley, S. (1996). The generation, assembly and delivery of information on livestock production: A case study of India. Chatham Maritime, United Kingdom: Natural Resources Institute.

McClelland, D. C. 1973. Testing for competence rather than for intelligence. *American Psychologist*, Vol. 28(1):1.

Mlangwa J.E.D. and Kisauzi D.N. (1994). Systems approach to animal health services delivery in sub-Saharan Africa: concept development. *Rev. sci. tech. Off. int. Epiz.*, Vol.13 (3): 665-672

Morton, J. and Matthewman, R. (1996). Improving Livestock Production through Extension: Information Needs Institutions and Opportunities. *ODI Natural Resource Perspectives*, No.12. <http://www.odi.org.uk/nrp/12.html>.

Mulder, M. (2007). Competence – The essence and use of the concept in ICVT. *European Journal of Vocational Training*, 40. Available at <http://www.cedefop.europa.eu/en/publications-and-resources/publications/412007>

Mulder, M. (2014). Conceptions of professional competence. In S. Billett, C. Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 107-137). Netherlands: Springer. doi: 10.1007/978-94-017-8902-8\_5

National Livestock Policy. (2013). Government of India Ministry of Agriculture Department of Animal Husbandry, Dairying & Fisheries.

OECD (Organisation for Economic Co-operation and Development). (2012). *Improving Agricultural Knowledge and Innovation Systems: OECD Conference Proceedings*, OECD Publishing. <http://dx.doi.org/10.1787/9789264167445-en>

Planning Commission Government of India New Delhi, (2012-17). Report of the working group on animal husbandry and dairying 12th five year plan.

Rajalahti, R. (2012). Sourcebook overview and user guide. In *Agricultural innovation systems: An investment handbook*. Washington, D.C.: World Bank.

Rao, S.V.N. and Natchimuthu, K. (2015). Inefficient Extension Services: Livestock Owners Bear the Brunt. *AESA Blog* No. 45. [www.aesa-gfras.net/Resources/file/Blog-SVN-FINAL-13%20March%202015](http://www.aesa-gfras.net/Resources/file/Blog-SVN-FINAL-13%20March%202015).

Rathod P.K., Nikan T.R., Sariput Landge., and Amit Hatley. (2012). Farmers Perception towards livestock extension service: A case study. *Indian Research Journal of Extension Education*. Special issue (ii): 1-5.

RCVS (Royal College of Veterinary Surgeons). (2006). *Essential Competencies Required of the*

Veterinary Surgeon. Available at: [www.rcvs.org.uk/Shared\\_ASP\\_Files/Uploaded\\_Files/966BD575-F3BB-443F995A-0D480DCE97F3\\_day1\\_year1\\_comp.pdf](http://www.rcvs.org.uk/Shared_ASP_Files/Uploaded_Files/966BD575-F3BB-443F995A-0D480DCE97F3_day1_year1_comp.pdf)

Singh, B., Prasad, Shiv, Sinha, D.K. and Verma, Med Ram. (2013). Estimation of economic losses due to foot and mouth disease in India. *Indian Journal of Animal Sciences*, Vol. 83 (9): 964-970.

Spielman D., Martha Negash, K., Davis, and Gezahegn Ayele. (2006). The Smallholder Farmer in a Changing World: The Role of Research, Extension and Education in Ethiopian Agriculture Paper submitted for ESSP Policy Conference 2006 "Bridging, Balancing, and Scaling up: Advancing the Rural Growth Agenda in Ethiopia" 6-8 June 2006, Addis Ababa, Ethiopia

Stone, B., & Coppennoll, S. (2004). You, extension and success: A competency-based professional development system. *Journal of Extension* [online], 42(2), 2IAW1. Retrieved from <http://www.joe.org/joe/2004april/iw1.php>

Suvedi, M. and Kaplowitz, M. (2016). What every extension worker should know: Core competency handbook. Urbana Champaign, IL: USAID-MEAS.

Varner, D.L. (2011). A phenomenological study of millennial generation cooperative extension educators' development of core competencies [Doctoral dissertation]. Agricultural, Education, Leadership and Communication Department, University of Nebraska. <http://digitalcommons.unl.edu/aglecdiss/27>

World Bank. (2006). Project appraisal document on rural capacity building project, Federal Democratic Republic of Ethiopia, Environment and socially sustainable development department, Eastern Africa, Africa region, Document of official document of The World Bank, report no: 35457-ET.





National Institute of Agricultural Extension Management (MANAGE)  
(An organisation of Ministry of Agriculture and Farmers' Welfare, Govt. of India)  
Rajendranagar, Hyderabad – 500 030, Telangana State, India  
[www.manage.gov.in](http://www.manage.gov.in)