

**PERCEIVED EFFECTIVENESS OF INDIGENOUS
TECHNICAL KNOWLEDGE (ITK) IN ANIMAL
HUSBANDRY, PREVALENT AMONG THARU TRIBES OF
BIHAR
THESIS**

**Submitted to the
Bihar Animal Sciences University, Patna**



**In partial fulfilment of the requirements for the degree of
MASTER OF VETERINARY SCIENCE
IN**

(VETY. AND A.H. EXTENSION)

By

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(VM0033/2019-2020)**

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2021**

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(Bihar Animal Sciences University, Patna, Bihar)

CERTIFICATE – I

This is to certify that the thesis entitled “**PERCEIVED EFFECTIVENESS OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK) IN ANIMAL HUSBANDRY, PREVALENT AMONG THARU TRIBES OF BIHAR**” submitted in partial fulfilment of the requirement for the award of the degree Master of Veterinary Science in the discipline of **Veterinary and Animal Husbandry Extension** of the faculty of Post-Graduate Studies, Bihar Animal Sciences University, Patna, Bihar is the bonafide research work carried out by **Dr. MANISH KUMAR MUKHERJEE, Registration No.: VM0033/2019-20** son of **Shri. KAUSHAL KISHORE** under my supervision and that no part of the thesis has been submitted for any other degree or diploma.

The assistance and help received during the course of this investigation have been fully acknowledged.

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CERTIFICATE – II

This is to certify that the thesis entitled, “**PERCEIVED EFFECTIVENESS OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK) IN ANIMAL HUSBANDRY, PREVALENT AMONG THARU TRIBES OF BIHAR**” submitted by **Dr. MANISH KUMAR MUKHERJEE**, Registration No-VM0033/2019-20, son of **Shri. KAUSHAL KISHORE** to the Bihar Animal Sciences University, Patna, Bihar in partial fulfilment of the requirements for the degree of Master of Veterinary Science in the discipline of **Veterinary and Animal Husbandry Extension** has been approved by the Advisory Committee after an oral examination of the student in collaboration with an External Examiner.

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(MANISH KUMAR MUKHERJEE)



DEDICATED TO:

MY PARENTS

&

TEACHERS



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ABSTRACT

India is a nation of Rishi, Muni and Vaidhya. India has an extremely rich legacy of indigenous wellbeing security and a few treatment frameworks that have been utilized like Ayurveda, unani, and homeopathy for the two creatures just as people since age of prehistoric and furthermore India has incredible decent variety and fluctuation in characteristic, social, culture, segment and strict viewpoints. These practices have been permeating starting with one age then onto the next by oral transmission. The Tharu clan are found in the Tarai region of Indo-Nepal fringe. "Tharu" is gotten from "Thar" which means “hill” and "Ru" signifies “near”. These clans are for the most part found in four Block of West Champaran in particular Bagha-2, Ramnagar, Gaunaha, and Mainatand were purposively selected for study on the basis of demographic distribution of Tharu tribes. These regions are collectively called "Tharuhat".

The present study “Perceived effectiveness of indigenous technical knowledge (ITK) in animal husbandry, prevalent among tharu tribes of Bihar” was carried out in West Champaran district of Bihar. The Tharu tribes had atleast one livestock animal and practising ITK was prepared from each block. From the list 50 livestock owners which are known to use of ITK's and 25 traditional healers which were considered to be knowledgeable in ITK's in animal husbandry in surrounding Tharuhat areas were selected randomly thus, all together 200 livestock owners and 100 traditional healers (300 respondents) were identified for the study.

The data were collected in two phases using a pre-tested interview schedule. During these visits the researcher has explored the general information about understanding of the used

ITK in animal husbandry like personal and socio-economic characteristics, communication and documentation of ITK. In 2nd phase researcher has explored the awareness and adoption of ITK among livestock owners and their effectiveness in Tharuhat area.

Personal and socio-economic characteristics of the respondents were studied and found that Majority of the respondents were having medium and old age category, low education level, mostly doing agriculture and animal husbandry for their livelihood, having medium (6-9 member) family size and had medium (21-40 thousand) and high (>40 thousand) level of annual income. Communication characteristics the animal husbandry officer/staffs for extension agency contact, radio for mass media exposure and ancestor for informal source of information are the most important source and channel of information regarding indigenous technical knowledge (ITK). Farmers of the study area (i.e., Tharuhat area) had well knowledge about use of indigenous practices in different areas of livestock rearing i.e., Breeding, Feeding and Health care. About 89 indigenous practices in those areas were documented. Which were used by Tharu people for livestock rearing. The finding revealed that about half of the respondents were found in medium category of awareness for given set of ITKs. Similarly, it was also observed that about half of the respondents were found in medium level of adoption. The livestock owners perceived ITK as more favourably accepted among the Tharu communities owing to its cost effectiveness, easy to use, local availability in the flora and fauna of the village and sustainability. Easy availability of indigenous plants, deep knowledge and trust regarding ITK were the main factors that determine the use of ITKs by the livestock owners of Tharu tribes.

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CERTIFICATE OF THESIS AND
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This is to certify that the thesis entitled **“PERCEIVED EFFECTIVENESS OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK) IN ANIMAL HUSBANDRY, PREVALENT AMONG THARU TRIBES OF BIHAR”** (Submitted by **Dr. Manish Kumar Mukherjee**, Registration No. **VM0033/2019-20**) S/O of **Shri. Kaushal Kishore** to the Bihar Animal Sciences University, Bihar Veterinary College, Patna in partial fulfilment of the requirement of M.V.Sc. Degree in the discipline of **Veterinary & A. H. Extension** has been examined by us. The candidate was examined by us on **16-07-2021**. We recommend the acceptance of the thesis. His performance in the oral examination has been found satisfactory.

(N. B. In case of Master's degree, Oral Examination will also include comprehension of the student in the discipline).

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Head of the Department

Forwarded to the Registrar, Bihar Animal Sciences University, Patna for necessary action.

**Director of Resident Instruction-cum-
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INTRODUCTION

Chapter – 1

INTRODUCTION

India is a nation of Rishi, Muni and Vaidhya. India has an extremely rich legacy of indigenous wellbeing security and a few treatment frameworks that have been utilized like Ayurveda, unani, and homeopathy for the two creatures just as people since age of prehistoric and furthermore India has incredible decent variety and fluctuation in characteristic, social, culture, segment and strict viewpoints. These practices have been permeating starting with one age then onto the next by oral transmission and viewed as the all-encompassing methodology for domesticated animals the executive's approaches embraced by nonliterate societies. These assorted variety and varieties give more hues in nation's viewpoint. India involves biggest number of ancestral populaces on the planets and Tharu clans are one of them, usually known as Tharu Adivasi. They live at Tharuhat zone in West Champaran region of Bihar and krishi and creature cultivation has the fundamental wellspring of employment.

West Champaran is one of the 38 districts of Bihar and Bettiah city is the administrative headquarter of this district. It is a part of Tirhut Division. It occupies an area of 5228 Sq.KM. It is located between 26° 16' to 27° 31' N latitude and 83° 50' to 85° 18' E longitude. It is bounded on the north by the hilly region of Nepal, on the south by Gopalganj district and part of East Champaran district, on the west by state of Uttar Pradesh and on the east by part of East Champaran district and Nepal.

The Tharu clan are found in the Tarai region of Indo-Nepal fringe. "Tharu" is gotten from "Thar" which means "hill" and "Ru" signifies "near". West champaran region involves the accompanying squares: Bettiah, Sikta, Mainatand, Chanpattia, Bairia, Lauria, Bagaha-1, Bagaha-2, Madhubani, Gaunaha, Narkatiaganj, Manjhaulia, Nautan, Jogapatti, Ramnagar, Thakraha, Bhitaha, and Piprasi. These clans are for the most part found in four Block of West Champaran in particular Bagha-2, Ramnagar, Gaunaha, and Mainatand. These locales are all things considered called "Tharuhat". The number of inhabitants in Tharu clan is 2.56 lakhs (as per census). It contributes about 0.25 percent of absolute populace of Bihar. Tharuhat shows the geological territory of 1500 sq. km. of West Champaran (GOI, 2012). "Thar" is a

nearby lingo which signifies "a man of the timberland". Their towns are inside the timberland territory – so they are living in or living with the woodland. Tharu Tribe have a natural protection from Malaria, Nepal Malaria Eradication Organization (NMEO) says that, it is their qualities that shield them from Malaria. They do horticulture, animal husbandry and halfway live on the woods produce for wellbeing security and food security. They communicate in Tharu language – a language that is very near Hindi, Awadhi, and Maithili. The majority of them follow Hinduism as the religion however, a little rate has changed over to Christianity and Buddhists. Every town has a head chosen fairly consistently in the period of Magh (Hindi month) that generally falls in January. Every family unit has a vote to project, not every grown-up or every person. This head called Badghar is answerable for the general government assistance of the town. He additionally has the power to rebuff individuals. The town cleric is additionally chosen in a similar way.

Traditional Tharu Tribes homes are organized in a very interesting way. They have a group of houses arranged around an open courtyard. So, the houses are independent but yet a part of a small community or an extended family. In the centre, there are tall wooden perch rooms and on each house was the cows cover for. It seems the house was equally divided between humans, cattle, and birds. Sugarcane and rice is main crop of the district. Animal husbandry is main or subsidiary occupation and major source of livelihood of the area. But the crop enterprise alone could not help them to increase their income and employment because of poor productivity, low availability of per capita arable land and also lack of other income generating avenues. Hence, there is heavy dependence of tribal households on animal husbandry practices.

Tharu Tribes of Bihar has an extremely rich legacy of indigenous wellbeing security and treatment frameworks that have been utilized in ease treatment and other related perspectives both in human just as creatures by them since the ages. Present day veterinary consideration ranges to just 20% of animal's proprietors of the World and around \$ 10 billion are lost every year because of animal's ailments (Nair et al., 2005). There are numerous conventional healers in Tharuhat who are learned and experienced in customary frameworks of treatment however their insight isn't recorded rather sent orally starting with one age then onto the next.

Wang (1998) characterized Indigenous Technical Knowledge's (ITK) as "the whole information and practices which depend on individuals' aggregated encounters in managing circumstances and issues in different parts of life and such information and practices are

uncommon to a specific culture". Grenier (1998) additionally characterized Indigenous specialized information (ITK) alludes to the remarkable, conventional, neighbourhood information existing inside and created around the particular states of ladies and men indigenous to a specific geographic region. The indigenous information is the information that individuals have increased through legacy from their predecessors. It is a people inferred science and it speaks to individuals' imagination advancements and abilities (Patel, 1993). The Indigenous Technical Knowledge's (ITK) is regularly taken to be inseparable from Traditional Knowledge (TK) (Richard, 1979), otherwise called Indigenous Knowledge (IK) or Local Knowledge (LK). The customary practices, the information on nearby healers and their ingenuity can't be overlooked. Nearby healers are the archive of gathered information passed on by overhearing people's conversations from age to age and accordingly for all-time record their encounters and information in a structure distant to pariahs.

An African proverb says "When an old knowledgeable person dies, a whole library dies" indicating the importance of Indigenous technical knowledge (ITK).

Indigenous Technical Knowledge is the information base for a society, which facilitates communication and decision making. Indigenous data frameworks are dynamic and are consistently affected by inner inventiveness and experimentation just as by contact with outer frameworks. Indigenous Technical Knowledge (ITK) is a significant component of the indigenous knowledge base. Local or indigenous knowledge refers to the cumulative and complex bodies of knowledge, know-how, practices and representations that are maintained and developed by local communities, who have long histories of interaction with the natural environment.

Now a day, many indigenous knowledge systems are at risk of becoming extinct because of rapidly changing natural environments and fast pacing economic, political and cultural changes on a global scale. Many indigenous practices vanish because they adapt too slowly. However, many practices disappear only because of the intrusion of foreign technologies that promise short term gains. Indigenous knowledge is part of the life of the rural people. Their livelihood depends almost entirely on specific skills and knowledge essential for their survival.

Since independence all efforts in India were concentrated on developing an allopathic-based veterinary infrastructure entirely under the government sector. There has been neglect of traditional system and knowledge to the extent that many of us, even those specializing in

veterinary medicine, are unaware of ancient literature and some are even sceptical about it (Rangnekar, 1998). In recent years emphasis has shifted towards modern science in the maintenance and development of livestock.

With the development of modern veterinary medicine, especially after the second world war, traditional medical practices have been increasingly replaced and overlooked at the international level, mostly because many people regarded them as ineffective and useless (Bizimana, 1997). Current medicine was thought to be able to solve almost all health problems of humans and animals. But this overestimation of current medicine has changed in the course of the “green wave” since the 1970s, particularly in industrialized countries. The “green wave” has been characterized by an increasing demand for natural products in the form of medicine, food and cosmetics and was mainly triggered by the side effects resulting from the increasing use of chemicals in various areas of life including medicine. The reconsideration of traditional medicinal systems in the industrialized world and the fact that current medicine is too expensive for many developing countries were the main reasons for the decision of the World Health Organization (WHO) in the 1970s to promote traditional medicated systems by checking scientifically the efficacy of plants used in traditional medicine and to identify the principles responsible for genuine therapeutic effects (Bizimana, 1997).

The study of indigenous knowledge will help to identify ideas which have considerable scope for commercial exploitation after value addition. It will also help to understand concepts and practices depicting the elements of sustainability to integrate with the modern information system for efficient resource management. Basic objective of this study is directed towards identification and effective use of such hidden technologies to make them scientifically approved in the research institutions and their availability must be all over the country where everyone can use them for good cause of the livestock of our nation. The ITK's itself is a very vast topic and applicability is meant for a number of purposes by farmers in a number of fields, viz. agriculture, animal husbandry, horticulture, fisheries etc.

This study is confined mainly to study the indigenous technical practices in animal health care and used to practice by Tharus tribes. It is a great necessity of today that a revival of interest in indigenous technical knowledge system of researchers and extension workers must be made with the realization and recognition that rural people in this state as well as country

have rich understanding of their own locally available resources through which they sustain the production potential of livestock enterprise.

Taking into account the aforementioned focuses this investigation named "PERCEIVED EFFECTIVENESS OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK) IN ANIMAL HUSBANDRY, PREVALENT AMONG THARU TRIBES OF BIHAR" has been attempted with following outstanding objectives.

- 1) To collect and document indigenous technical knowledge (ITK) followed by traditional healers and livestock owners in Tharuhat area.
- 2) To study the extent of awareness and adoption of indigenous technical knowledge (ITK) among livestock owners.
- 3) To study the perceived effectiveness of indigenous technical knowledge (ITK) in Tharuhat area.
- 4) To identify the source and channels of diffusion of knowledge among traditional healers and livestock owners.
- 5) To explore the constraints faced by Tharu tribes in adoption of indigenous technical knowledge (ITK) in animal husbandry and allied sectors.

1.2 IMPORTANCE AND SCOPE OF THE STUDY

- 1) In-depth examination will help in distinguishing proof and documentation of locally accessible natural plants and nearby conventional information among creature farming practices in Tharuhat zone of West Champaran region.
- 2) This investigation will assist with breaking down the degree of mindfulness and appropriation of indigenous specialized information (ITK) among domesticated animals proprietors.
- 3) The investigation will likewise assist with breaking down different indigenous offices, for example, creature medical care offices, accessible in creature cultivation and its apparent viability in Tharuhat territory of Bihar.
- 4) The present examination will have the option to produce an exact information on the expense and come back from creature farming among Tharuhat region.
- 5) The discoveries of this examination will help the augmentation laborers in understanding the information about different indigenous specialized information (ITK) identified with creature farming.

- 6) This study will likewise help the recognizable proof of the source and channels of dispersion of information among conventional healers and animals proprietors.
- 7) The current examination has common-sense utility to analysts working with the indigenous individuals, specialists managing ethno-veterinary meds, researchers, field expansion functionaries, and so forth by making them mindful of the benefits and bad marks of the indigenous specialized information appropriate to dairying.

1.3 LIMITATIONS OF THE STUDY

Although each exertion has been made to make this investigation as extensive as conceivable, it is dependent upon the constraints natural in a solitary specialist venture. A few of impediments are shown underneath:

- ❖ The consequences of the investigation depend on the data gathered from predetermined number of respondents from four Blocks of West Champaran area in Bihar. Consequently, the result of the investigation can be summed up to the region of the examination just as to different regions with indistinguishable socio-social and agro-climatic conditions.
- ❖ The conditions of the investigation territory was additionally restricted to just significant pieces of creature cultivation and veterinary science however there are numerous different regions of rustic life which are of equivalent significance.
- ❖ The discoveries of the investigation depend on the communicated reactions of the respondents which probably won't be totally liberated from singular inclination and preference.
- ❖ The present examination being a solitary understudy's thesis Project, experiences normal constraints of time and resources.

In spite of the above impediments, due consideration was given to make this investigation more helpful and as profound and precise as could reasonably be expected.

1.4 ORGANIZATION OF THE THESIS

This thesis has been introduced in five sections in a consecutive way. The main section secured, the introduction covering essential background information about Tharu tribes, statement of the problem, highlights objectives, scope and limitations of the study followed

by a comprehensive review of relevant literature having a bearing on this study. Research methodology has been described in the third chapter. This chapter deals with locale, sampling procedure, operationalization of concepts, variables and their measurements, data collection and statistical analysis. The findings and discussion have been presented in fourth chapter objective wise. The fifth chapter deals with the summary and conclusion, which have emerged from the results of the study and suggestions for further research. Bibliography and appendices an information utilized in this study have been presented in the end.





REVIEW OF LITERATURE

Chapter- 2

REVIEW OF LITERATURE

For any scientific investigation, a critical review of literature indicates that macro level of study have been done in the indigenous animal husbandry practices among the tribes, in our country. It is mandatory on the part of researcher to go through an earnest attempt was made to review whatever literature was available pertaining to work done among tribes in India and abroad related to indigenous animal husbandry practices besides those from the related fields of animal husbandry. Moreover, it helps to elucidate the problem for present study, formulate objectives of investigation, and decide upon the methodology and exemplifying the inference of the study.

Keeping in view the objectives of the present study, the relevant literature review is presented chronologically in this chapter under the following subheads:

2.1 Concept of indigenous specialized information framework.

2.2 Individual and socio-economic qualities.

2.3 Communication qualities.

2.4 Documentation of Indigenous Technical Knowledge (ITK).

2.5 Perception level of improved animal husbandry practices and its relationship with various factors.

2.6 Constraints as perceived by respondents regarding the use of Indigenous Technical Knowledge (ITK).

2.1 Concept of indigenous specialized information framework:

The term indigenous information, ‘local knowledge’ and ‘traditional knowledge’ have been utilized in the writing reciprocally.

McCorkle (1986) expressed that ethno veterinary medications covers people groups information, abilities, strategies, practices and convictions about the consideration of their creatures.

Farrington and Martin (1988) stated that indigenous Technical Knowledge depends on information, convictions and customs which are inside steady and legitimate to those holding them, yet at chances with the unbiasedly concluded discoveries of formal science.

Wang (1998) defined that the indigenous information might be characterized as the whole of information also, rehearses which depend on individuals' gathered involvement with managing with circumstance, issues in different parts of life and such information and rehearses are unique to a specific culture.

Warren (1991) stated that Indigenous information (IK) is the neighbourhood information that is exceptional to a given culture or society. Indigenous information (IK) appears differently in relation to the worldwide information framework produced by colleges, research establishments what's more, private firms. It is the reason for neighbourhood level dynamic in agriculture, wellbeing care, food readiness, training, normal asset the board and a large group of different exercises in rustic networks.

Chowdhury and De (1993) found that Indigenous Knowledge is unwritten, undiscovered and to a great extent unutilized information that is one of a kind to a given culture and society. The significance of recording of Indigenous Knowledge is to extend and quicken exploration, arranging and advancement.

Havekort (1993) stated that Indigenous Knowledge is the genuine information on a given populace that mirrors the experience dependent on customs and incorporates later involvement in present day innovation. Indigenous information framework may seem easy to outcast yet they speak to components to guarantee the negligible jobs for nearby individuals.

Rajasekaran (1993) concluded that Indigenous Technical Knowledge the efficient group of information obtained by the neighbourhood individuals through the collection of encounters, casual examinations, and personal comprehension of the earth in a given culture.

Patel (1993) stated that Indigenous knowledge is the knowledge that people have gained through inheritance from their ancestors. It is a people derived science and it represents people's creativity, innovations and skills.

Flavier et al. (1995) stated that Indigenous Technical Knowledge (ITK) is the data base for a general public, which encourages correspondence and dynamic. Indigenous data frameworks are dynamic and are continually affected by inner inventiveness and experimentation just as by contact with outside frameworks.

Wang (1998) concluded that Indigenous information is the entirety of information and practices which are in view of people's amassed involvement with managing Scircumstance,

issues in different parts of life and much information and practices which are unique to a specific culture.

Gremier and Louise (1998) stated that Indigenous Technical Knowledge alludes to extraordinary, conventional, nearby information existing inside and created around explicit states of ladies and men indigenous to a specific geographic region.

Majhi (2008) concluded that it depends on the necessities, sense, perception, experimentation and long insight of the native social orders of various regions.

Ghosh and Sahoo (2011) stated that the native practices are viewed as the comprehensive methodology for domesticated animals the board philosophies embraced by non-educated societies. For nearby networks native information is considered as an un-distinct piece of their way of life and history.

Devaki and Mathialagan (2015) stated that to ask about native information is an incredibly difficult undertaking as this information remains put away in brains of individuals and is passed verbally to others because of absence of appropriate documentation.

Bhanotra and Gupta (2016) concluded that the native information is locally accessible, practical, socially viable and monetarily reasonable with the held conviction among ranchers that it is stronger.

2.2 INDIVIDUAL & SOCIO-ECONOMIC QUALITIES:

2.2.1 AGE

Verma (2003) detailed that the normal age of the respondents was found to be 38.01 ± 14.34 years, in his M. V. Sc., Thesis, Pig farming practices of tribal pig farming of Ranchi District.

Seth (2004) revealed that dominant part of respondents (65%) was of middle age bunch followed by youthful age (31.25%) and mature age gathering (3.75%), in his M. V. Sc., Thesis, Problems and prospects of Dairy cooperatives in Jharkhand.

Kolawole (2007) reported that around 30 per cent of the respondents was in the age scope of 30 - 40 years while 35 per cent of the populace was somewhere in the range of 41 and 50 years. Around 20 per cent was somewhere in the range of 51 and 60 years and just 15 per cent of the respondents were 61 years or more.

Shisode et al. (2009) found that dominant parts of respondents in their particular examination territory were of middle age gathering.

Saha et al. (2010) observed that about 50.83 per cent of the ranchers had a place with the middle age classification (25-45 years), whereas just 25.83 per cent and 23.33 per cent of them were in the mature age (>45 years) and youthful age (<25 years) classification separately.

Rawal et al. (2011) reported that Greater part (52.00%) of the dairy ranchers had a place with middle age bunch followed by mature age gathering (30.00%). The respondents having a place with youthful age bunch were 18.00 per cent as it were.

Jha (2012) demonstrated that 53% respondents had a place with middle age gathering, trailed by 27.5% respondents were of youthful age gathering and 19.5% were of mature age gathering.

Mgbakor et al. (2013) reported that dominant part of the radio audience members. 65.20 percent of the respondent was male, while 34.80 percent were female. Greater part of the respondent's 68.70 percent was of middle age class between the ages of 41 to 60 years and 20.90 percent were between the ages of 21 to 40 years.

Adeola (2014) found that Majority of rural people practicing indigenous ethno veterinary practice were within the age range of 36-50 years.

2.2.2 EDUCATION

Khandekar (1992) revealed that among ancestral ladies of M.P. practically all the ladies of Gond clan were unskilled.

Fulzele et al. (1995) found that more than 30 per cent of the export farmers has education up to higher secondary.

Singh (2011) revealed that around one-third of the respondents were illiterate and remaining two-third varied in their educational status from can read and write only to graduate level.

Raksha (2011) reported that 46% of the respondent had medium family training status and factors like instruction of respondents, schooling status of the family, family type and family size are decidedly connected and huge at 5%.

Methi and Sathish (2014) detailed that larger part of the respondents were instructed up to essential and centre school. 27.50 per cent was unskilled people and little percent of them (7.5%) were instructed up to secondary school.

Bhanotra et al. (2016) reported that just 31.67 per cent of the respondents were unskilled and staying 68.33 per cent were proficient. Among literates, 24.16 per cent were instructed up to optional level followed by 20.00 per cent having centre level training.

2.2.3 OCCUPATION

Pandey (1996) found that dominant part of the respondents had farming as essential occupation followed by work and dairying.

Hasnain (1994) found that the significant clans of chotanagpur are agriculturists. Chasing gathering, fishing, and handiworks are no more their essential occupation, yet exercises in relaxation.

Biswas et al. (2005) detailed that dairy cultivating was more satisfactory among the little ranchers rather the little ranchers rely more upon dairy cultivating for their work, while different classifications of landholders took up domesticated animals cultivating as subsidiary methods for gaining.

Sangu et al. (2006) found that the landless workers, peripheral ranchers and huge ranchers have been embracing commercialization of dairying, in the locale, while little and medium ranchers are keeping milch animals fundamentally for their home-grown use.

Singh (2007) revealed dairying as the fundamental wellspring of business for all the khatal individuals.

Kerketta (2008) in his examination reasoned that larger part of the respondents had farming as essential occupation and work and domesticated animals raising as auxiliary occupation.

Chand (2011) in his investigation uncovered that 42.67 percent ranchers occupied with agribusiness with dairy, 26.67 percent in horticulture + dairy + administration, 14.00 percent in farming + dairy + business, 13.33 percent in horticulture + dairy + administration, whereas just 3.33 percent in dairy + administration + business.

Verma (2012) in his examination saw that 45.33 percent of dairy ranchers occupied with farming with dairy, 22.00 percent in horticulture + dairy + business, 16.67 percent

agribusiness + dairy + administration, 12.00 percent in agribusiness + dairy + work though just 4.00 percent in farming + dairy + business. Accordingly, close about 45.00 percent of respondent were receiving blended cultivating in the examination region Faizabad locale of Uttar Pradesh.

2.2.4 TYPE AND SIZE OF FAMILY

Khatik (1994) reported that greater part of tribal livestock owners had medium and enormous size family.

Pandey (1996) found that huge level of both tribal and non-tribal (61.67 and 60.00% separately) respondents were having medium family size with 5 to 8 relatives followed 22.66 and 30.00 % of ancestral and non-ancestral respondents individually having enormous family size with in excess of eight relatives and just 11.67 and 10.00 % of the ancestral and non-ancestral respondents individually fell under little family size with relatives up to four. There was prevalence of the atomic sort of family in the examination territory; the size of family didn't go very enormous.

Tiwary (2000) respondents having a place with little, medium and enormous family size didn't contrast essentially in their salary level from piggery endeavours.

Mahto (2008) observed that dominant part of the respondents (56.00%) was discovered having a place with enormous family size with 8 or more individuals.

Gour et al. (2015) Reported that greater part of the respondents (69.33%) had a place with medium family size class followed by 24 per cent ancestral animals' proprietors had little family size and just 6.67 per cent fell in the classification of enormous family size and 87.33 per cent ranchers had a place with joint family, though, just 12.67 per cent had a place with family unit.

2.2.5 LAND HOLDING

Srivastava (1982) discovered majority of normal land holding among the munda tribal of chotanagpur to 5 hectare of land.

Narayan et al. (1987) from the investigation led in A.P. discovered that the normal size of land holding to be 0.96 hectare of land. He further revealed that 31.58% of them were landless.

Shweta (2010) revealed during a study that dominance of peripheral ranchers having 2.65 to 3.61 hectare of land in the Ranchi region of Jharkhand.

Rajkamal (1993) detailed that all the groups of kanikkar tribal had land and majority share of them had 1 to 2 hectare of land.

Pandey (1996) revealed that majority tribal had peripheral land holding followed by little and landless ranchers.

Mahto (2008) observed that most of the respondents were large land holding ranchers in Ranchi region of Jharkhand.

Shisode et al. (2009) revealed that the greater part of the dairy ranchers (78%) had minor/little landholdings.

Singh (2007) found that greater part of the respondents didn't have any land and were keeping up khatahs on the Government (Gair majaruwa) land.

Saha et al. (2010) found that about 49.17 per cent of the respondents had a place with little homestead size (<1.5 acres of land) classification though 38.33 per cent and 12.50 per cent of them had a place with medium (1.51-5.07 acres of land) and enormous (>7 acres of land) ranch size class individually.

Gour et al. (2016) reported that about 22.00 per cent of the tribal animal's proprietors were landless. The greater part (64.67%) of the respondents had 1-2 hectare of land and had a place with little rancher's class while 13.33 per cent of the respondents were negligible ranchers (<1 hectare).

2.2.6 HERD SIZE

Srivastava (1982) found that the majority of respondent 3-4 numbers of livestock for every Kunda tribal family.

Kumar (1992) also observed that most of the numbers of livestock i.e., 2-3, milch - cows per tribal family unit.

Mishra (1994) revealed that maximum number of animals i.e., 2-5 dairy animals for every ancestral family in ancestral zone of Bihar.

Singh (2007) also observed that majority of khatal proprietor respondents (80%) had huge (>6 creatures) crowd size.

Pandey et al. (1989) in his investigation on embraced towns of Birsa Agricultural University, Ranchi found that 68.5 per cent of the respondents were having cow's, 13.6 per cent had wild oxen, 46.0 per cent awful bullocks, 63.0 per cent had calves, 80.5 per cent raised pigs, 35.5 per cent raised goats and 53.5 per cent raised poultry.

Shinde et al. (1998) revealed that more than two-third of dairy ranchers had up to 4 animals, while 18.33 percent of dairy ranchers were had 5 to 8 animals, trailed by 9 to 12 animals (14.17%).

Mundhwa and Padheriab (1998) found that 63.56 percent of dairy ladies were had medium crowd size (4 to 10 creatures), trailed by enormous group size for example over 10 farmers (29.33 %) and little group size for example 1 to 3 livestock (7.11 %).

Temkar et al. (2000) observed his examination in Anand locale of Gujarat State, stressed that 43.33 per cent of respondents had medium level group size, trailed by 40.00 per cent with low and 16.67 per cent with enormous crowd size. Further he detailed that greater part of respondents (83.30 %) had medium to little crowd size since respondents were not completely subordinate just on dairying but rather liked to have a low to medium size of group to legitimize both livestock farming and agribusiness occupation.

Gour et al. (2002) indicated that two fifth (40.76 %) of the dairy ranchers had low level crowd size, trailed by 32.50 with high and 26.74 with medium group size.

Wadear et al. (2003) found that normal group size of milch animals controlled by little dairy ranchers was 3.58, medium dairy ranchers (3.83) and huge dairy ranchers (4.20).

Khin M. O. (2005) observed that 7.50 percent of dairy ladies had 1 cross reproduced cow, trailed by 2 crossbred bovines (4.16 %) and 3 or more cross reared cows (0.83 %), while 1 nearby cow (19.16%) and 2 or more (9.16 %).

Singh et al. (2007) during his study on animal rearing pattern in khatal found larger part of khatal proprietor respondents (80%) had enormous (>6 creatures) group size.

Shweta et al. (2010) reported that about 60% of respondents had medium group size (3-9), 35.83% had little (up to 2) crowd size and 4.16% respondents had enormous (more than 9) group size.

Bhanotra et al. (2016) found that dominant part of ranchers (68.33%) had medium crowd size (3-7 animals) though 25.83 per cent were having little group size (<3) and not many (5.83%) ranchers had more than 7 (huge class) dairy animals in their group.

2.2.7 ANNUAL INCOME

Oraon et al. (1989) found that tribes had low financial status in the village and major part of low income was originated from domesticated animals and poultry.

Pandey (1989) revealed that dominant part of the ranchers in selected research area were under low annual income groups though.

Devi (1999) found the majority respondent under low to medium annual income group in his studies.

Mahipal and Kherde (1991) revealed that financial status was discovered to be emphatically and fundamentally corresponded with by and large selection of dairy advancement.

Vidyarthi et al. (2003) found that the majority of the goat proprietors were under the category of low to medium socio economic group.

Nagaraju and Selvaraj (2002) reported that majority of respondents had medium category of annual income followed by low and high level of income group in his studies.

2.3 COMMUNICATION:

Many examination discoveries show low correspondence stream in tribal. In any case a portion of the applicable investigations are introduced underneath regarding the similar nature of the research:

2.3.1 EXTENSION AGENCY CONTACT:

Dana (1987) found that the majority of respondent has extension agency contact were essentially associated with demeanour of domesticated animal's proprietors towards animal husbandry.

Kaushik et al. (1988) observed that extension agency contact was decidedly and exceptionally fundamentally related with information level and appropriation of logical dairy cultivation rehearses.

Oraon (1989) revealed that the extension agency contact has majority of respondent were high among tribal of Ranchi districts of Jharkhand.

Verma (2003) found that there was less or no extension contacts in the remote villages as compared to nearly villages indicated that the Extension agents did not bother going deep interior villages. It is amusing to see that even in the nearby villages the extension agent's contact was quite low.

Vidyarthi (2003) revealed during a study that majority of the respondents from nearby villages and remote villages have no extension agent's contact.

2.3.2 MASS MEDIA EXPOSURE AND INFORMAL SOURCE OF INFORMATION

Dwivedi et al. (1993) in his investigation on data correspondence among domesticated animal's proprietors found that veterinary officials from institutional companions or family members and dynamic ranchers from non-institutional and furthermore radio from broad communications introduction bested as more much of the time counselled wellsprings of data.

Pandey (1996) revealed during his study that mass media exposure still had lowest penetration in his study area.

Sawarkar et al. (2001) observed that the mass media exposure introduction, viz., banner, radio, TV, bunch media, viz., meeting and individual media viz., domesticated animals' advancement official (L.D.O.), companions, family members, dynamic ranchers were the diverse wellspring of specialized data about reproducing, taking care of, animal medical services, the executives and grub creation for ancestral dairy ranchers.

Seth et al. (2004) indicated that in his study majority of his respondents fell in low level of mass media exposure.

Jha (2012) revealed during his study that in non-adopted village, greater part of respondents (i.e., 58%) was fell in low mass media exposure.

2.4 DOCUMENTATION OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK)

Endeavours have been made to gather all the accessible and pertinent data with respect to the utilization of ITK in reproducing, taking care of and medical services in various animal husbandry practices.

Talapad et al. (1990) observed and review on customary insight of Gujrat tribal on creature feed and grain practices and found that the majority of the practices, for example, taking care of Mahua cake with different fixings improved the milk creation, taking care of seed of Kuvadia weed and woodland tree leaves of Siras, Bilva, Sisham and so on were the acceptable wellsprings of feed and supplements. They called attention to that the majority of the practices according to logical perspective were acceptable and such astuteness be helpful in arranging the applied creature dietary projects fit to nearby circumstances.

Ibrahim (1991) led an investigation on indigenous agro-veterinary information framework in Nigeria. He referenced that ethno-agro-veterinary information goes about as an asset for human and especially country advancement in Nigeria explicitly and Africa by and large. Studies led in the Nigerian parched and semi-bone-dry zones show how indigenous information can have a valuable influence in the development of arrangements, instruction, creature creation and wellbeing.

Gupta and Patel (1992) found that a few indigenous practices on canker, break, tympani, respiratory, ailment, urinary issue and fever in field situation.

Balaraman (1993) revealed that the escalated domesticated animal's creation framework supported up by serious land use for grain creation offer huge degree for raising domesticated animal's efficiency to high and keep up at a supportable level. The improved cultivating innovations identified with creature farming can advance customary domesticated animal's creation in Sikkim.

Rangnekar (1993) found that numerous indigenous innovations in animal rearing, taking care of and wellbeing control were in fact sound and empowered ranchers and domesticated animal's proprietors to get by under horrible conditions just as flourish well under good conditions.

Ratan and Srivastava (1993) observed a few indigenous strategies in creature cultivation which incorporate fix of sicknesses by thymol, ginger, mahogamy, pepper, turmeric, bamboo

leaves and so forth It was basic that at whatever point a goat experienced rinderpest, bamboo leaves were taken care of for its fix.

Chander and Mukherjee (1994) expressed 18 traditional animal husbandry rehearses as to, retention of placenta, parasitic invasion, break, foot and mouth malady, fever, colic and torment.

Kohler (1994) detailed about the overall information and treatments for 3 significant camel ailments trypanosomiasis, mange and camel pox. He additionally educated that the blend of conventional and present-day drugs may give savvy elective methods for camel wellbeing support.

Mishra et al. (1994) detailed about the plants being used for ethno-veterinary purposes as family meds and those utilized for expanding the quality, force and draining limit of the creatures.

Sagar (1995) observed that ancestral had tremendous information on indigenous widely varied vegetation for treating their livestock. Tharu clans of Nainital area of UP utilized accessible spices, home grown results and other characteristic resources for restoring infirmities, for example, mastitis, FMD, R.P., H.S., swell, loss of craving, removals of shoulder and so forth.

De and Rao (1995) recorded ethno veterinary practices, acquired ranchers' convictions also, logical reasoning. They called attention to that ranchers treated tympani by controlling a combination of onion 500 gms, molasses 250 gms, dark salt 25 gms and soft drink 25 gms.

Gupta and Singh (1995) considered conventional arrangement of restoring domesticated animal's sicknesses and reported that numerous regular sicknesses, for example, fart, acid reflux, diarrhoea, fever, dry hack, bubbles of mouth, inflammation of the udder, mastitis, FMD and HS were restored through age old encounters.

Pandey (1996) found that respondents were utilizing three distinct blends for the treatment of loose bowels. Decoctions from the bark of kendu (*Diospyros cordifolia*) and boycott kulthi (*Atylosia scarabaeoides*) was the most broadly utilized mix followed by about portion of the respondents. In excess of a fourth of dairy proprietors were directing the combination of Ajwain, Methi, Saunf, Sonth and Rock Salt with molasses. A few respondents were utilizing unripe mango and barks Amda (*Spondias magnijera*), Semal (*Bombax ceiba*), Pojo (*Litsae*

polyantha) and Anwala (*Emblica officinalis*) and Jamun (*Syzygium cumini*) either separately or in mix.

Vivekanandan (1996) archived a few indigenous practices on domesticated animals taking care of, FMD, fever, prolapse of uterus and rectum, tonic for skinny bullocks, heart inconvenience in bullocks, food poison, and toxic nibble.

Chinthu et al. (1997) reported that a few indigenous advances for foot and mouth infection, rinderpest/looseness of the bowels, hack and outside parasites and so forth.

Patel et al. (1997) archived a few indigenous practices on advancing lactation, wound, burden nerve, looseness of the bowels and urinary issue.

Zuberi (1997) reported that through hundreds of years country individuals have been depending on a plant based medical care framework for their homegrown creatures. A pilot review uncovered seventeen maladies of cows is dealt with utilizing upwards of 39 neighbourhood plant species.

Lans and Brown (1998) observed 28 restorative plants for held placenta, oestrus acceptance, urinary issues, loose bowels, wounds, worm pervasion and milk creation.

Lans, Cheryl and Gabriel (1998) recorded different ethno-veterinary medication for patio poultry-the utilization of lime squeeze in duck's drinking water for respiratory disease for diminished hunger the chicken are given squashed garlic (*Allium sativum*) sprinkled on the food or coconut water (*Cocos nucifera*) in the drinking water.

Padmakumar (1998) revealed that foot and mouth infection, mastitis, fever, swell, loose bowels and helminthiasis are the illnesses most generally treated by methods for ethnoveterinary medication.

Prakash (1998) found that locals regarding Jambla utilize the inward bark of *Moringa pterygosperma* and Sangheda trees to relieve the affected cattle from pain and experiencing joint inflammation.

Kaul et al. (1998) observed that ranchers are exceptionally rich wellspring of indigenous specialized information identified with steers raising. Their 'deshi' strategy for cows raising ought to be known to the organizers of steers improvement program.

Varshney (1998) found that about the individual from customary restorative assets in overseeing gastro-intestinal problems viz., heartburn, dyspepsia, gastric ulcers, colic, tooting, sharpness, gastritis, blockage, and impaction, the runs looseness of the bowels, parasitism, jaundice and hepatitis.

Koradia (1999) studied that indigenous practices on discharge in bullocks, prolapse of uterus and rectum.

Lakshmana et al. (2001) revealed an indigenous home-grown mix, E-721B, for its value in quick extreme touchiness among creatures.

Das et al. (2002) found that a few indigenous practices on the runs, foot and mouth sickness, mastitis, eye disease/injury, fart and tympani.

Das (2002) expressed that Oilcake and salt are blended in with grub once in 15 days to forestall general issues. Cotton shells are bubbled in water and took care of two cows and leaves of tamarind utilized as green feed for bullocks in summer season.

Ghosh (2002) studied that a few indigenous practices on parturition, skin infection, rodent chomp, expanding of throat, colic torment, noxious bug nibble, typhoid fever cracks/joint agony and tooting.

Ravikumar et al. (2002) studied about called attention to a few hints on indigenous specialized information for break, wound, unfavourably susceptible sores, harmful nibble, and separation of horn, burden nerve, joint pain, condition influencing eye and malignant development.

Selvaraj (2002) reported about an utilization of tobacco inside the nostrils or even normal salt to slaughter drains was viewed as most substantial practice.

Tripathi and Mandape (2002) reported a few indigenous practices on respiratory issues, stomach related issues, skin issues, foot and mouth illness, fever, urinary issue, growing in neck, departure of dead calf, limping, rankles in mouth and tick pervasion.

Tripathi et al. (2002) contemplated indigenous vision of relieving stomach related problems and discovered that dynamic elements for treating/relieving stomach related problems were to be specific decoction of opium, dark cumin seed, pepper, Harad, Bahera, dark cardamom and so on.

Webb and David (2002) tested the utilization of neem seed separate for controlling basic steer's ticks of the Ixodidae species and found that neem seed extricate is viable in controlling ectoparasites in domesticated animals.

De (2003) reported 175 indigenous specialized practices for different illnesses of creature farming. He additionally oppressed 17 ITK's to approval test through measurement of indigenous information (QuIK) strategy and discovered ITK's to be viable against current veterinary medications (MVD's) for the particular sicknesses as far as cost, accessibility, results.

Samal et al. (2003) detailed that dropping of pigeon was taken care of to the dairy animals and wild oxen to get them heat. The droppings are said to contain oestrogens needed for actuating heat in creatures. Likewise, singed salt with cucumber leaves (*Cucumis sativus*) was taken care of to the creature for inciting heat in them.

Tiwari and Tiwari (2003) revealed that various indigenous medications utilized by domesticated animals proprietors of Tarai locale, Bareilly for different illnesses of domesticated animals viz. swell, endoparasites invasion, foot and mouth ailment, mastitis, bubbles and sore, tick invasion, lice pervasion, haemorrhagic septicaemia, snake nibble, fever, aborticide, anoestrus, maintenance of placenta, low milk efficiency, aggravation and torment in joints, blockage, wounds and wounds and so forth.

Bisht et al. (2004) found during their study that various ethno veterinary practices utilized by animal's proprietors of Kapkot square of Bageshwar locale of Uttranchal. She revealed that animal's proprietors use to ethno veterinary meds for various issues for example canker, bone break, skin ailment, loose bowels, dermatitis, shortcoming, galaghotu, gastric, high body temperature, helpless lactation, sterility, snake nibble, tice/lice pervasion, wounds and so on.

De et al. (2004) revealed about indigenous specialized information in creature farming. He enrolled various ITK's for different sicknesses viz., swell, and loose bowels, wounds and so forth of animals. He additionally performed approval preliminaries of ITK's and discovered them to be compelling against current veterinary medications (MVD's).

Seeralan (2004) studied that controlling juice of Kattalai and Nerinji with Moringa blossoms and Adalsa for actuating heat in creatures and taking care of Glyricidia for expanding milk creation were viewed as most legitimate practice.

Manjhi (2008) found that the individuals of Vallabh Rao Palem (VR Palem) utilize indigenous information, including treatment of a portion of the human sickness. So far as, specialized information in agrarian practice in the town is concerned, the creepy crawly and vermin control in a portion of the financially significant plant like coconut tree is discovered to be significant one. Furthermore, it has been likewise discovered that there exists a portion of the significant conventional information for mending the cracked bones and tendons just as solutions for different stomach related issues.

Das et al. (2009) found during his study on ethno veterinary practices and report the animals and vocation related social real factors and their interlinkage in rustic social orders of Sundarbans. The townspeople of the investigation towns perpetually restarted to ethno-veterinary practices to dispose of the basic sicknesses of their creatures in any case without anyone else followed by the individual Villagers having better information in those practices. Be that as it may, not many efficient words related ethno-veterinarians were found over the towns. Ethno-veterinary practices were continued in paschimil tuntiphola in steers, in foot and mouth infections or different kinds of sore, in deferred removal of placenta, premature birth and dystocia, in pox in duck and chicken, in free stool, in sprain/strain, in waterfall, and so forth.

Ponnusamy et al. (2009) revealed that indigenous specialized information developed from the encounters of ranchers found to group's pragmatic utility in tackling a portion of the rancher's issues under their own conditions. The seaside agro-biological system offers a great deal of extension in indigenous specialized information. The ITKs reported on dairy undertaking could support mainstream researchers and ranchers to utilize them to the best favourable position of themselves.

Galav et al. (2010) revealed that entire Cissampelos pareira plants were taken care of too creatures with grain to fix looseness of the bowels and blood touched the runs. Additionally, Fruits of Cucumis callosus were squashed and blended in with sugar, oil and water and took care of to creatures experiencing the runs. Now and then, products of the soil of Cyamopsis tatrigoobola were given alongside grub to fix the runs.

Kumar et al. (2010) detailed the seeds of dhatura (*Datura stramonium*) was burnt and left in open overnight and then fed to milch animals.

Kuvar, Sachin and Bapat (2010) reported that tanyal (*Cissampelos pareira*) root extract has a positive effect on healing process of wound.

Mishra et al. (2010) revealed that in states of watery eyes combination of jaggrey, powder of methi seed, ajwain and ginger was applied to animals affected from watery eyes.

Sah and Dubey (2010) reported that paste of maitha (*Polygonatum verticillatum*), bhang (*Cannabis sativa*) and ash were useful in sprain and reducing inflammation in animals.

Singh et al. (2010) studied that there is a noteworthy distinction in the apparent adequacy of ITK and PST among animal's proprietors at 1% level of centrality in all the seven perspectives viz., cost, openness, supportability, versatility, discernment and multifaceted nature according to haemorrhagic septicaemia infection in creatures.

Vijigiri and Sharma (2010) reported that crushed leaves of *Abrus precatorius* were applied on wound, in his research Traditional Uses of Plants in Indigenous Folklore of Nizamabad District, Andhra Pradesh, India.

Deshmukh et al. (2011) revealed that Shatawari roots (*Asparagus racemosus*) were commonly utilized after baby blues. It expands milk creation in steers and furthermore helps in mending and reconstruction or involution of uterus.

Deshmukh et al. (2011) detailed that bibba (*Semecarpus anacardium*) seed oil was applied by walking and mouth infections lesion.

Deshmukh et al. (2011) detailed that *Crotalaria verrucosa* Leaf separate was given to the cattle for restoring hemorrhagic septicaemia and found a positive results in 68 per cent case.

Gajendran and Karthickeyan (2011) found that the data with respect to indigenous specialized information in duck cultivating directed in Uthiramerur taluk of Kancheepuram region and Tindivanam taluk of Villupuram area of Tamil Nadu. A portion of the normal illnesses among ducklings were coryza and the respiratory trouble because of presentation to chill climate during hefty fog, other than duck plaque which causes high dreariness and mortality. During summer season, expanding of joints, heaving for breath, and so forth were taken note. To treat this ailment, the ranchers utilized a decoction made of Poduthalai leaves (*Lippia nodiflora*), underlying foundations of paragrass, Omum and Vasambu (Sweet banner; *Acorus calamus* L).

Rathod et al. (2011) revealed that taking care of Coriander (*Coriandrum sativum*) seed furthermore, Jira (*Cuminum cyminum*) was helpful in case of acidosis.

Khan et al. (2012) revealed that Carissa caranta departs were squashed with nectar and took care of too creature experiencing foot and mouth sickness.

Kumar and Bharti (2012) detailed that foundations of *Trachyspermum ammi* (ajwain) was given if there should arise an occurrence of eye disease.

Kumar and Bharati (2012) revealed that about 100gm of Satawari (foundation of *Asparagus racemosus* Wild.), 250 gm of Mangraill (product of *Mesua ferea*). 200 gm of Sooth (powdered-rhizome of *Zingiber officinale* Roscoe) and 125 gm of Ajwain (product of *Trachyspermum ammi* Sprague) were squashed together and directed orally with Naar (bamboo glass) just as applied remotely on the udder as a salve for the treatment of mastitis. Likewise, a couple of leaves of Patthar-Choor (*Trianthema portulacastrum* L.) were squashed and blended in with somewhat salt and applied to the udder and nipples as a bomb.

Malla and Chhetri (2012) found that *Cynoglossum zeylanicum* leaf juice was utilized to treat conjunctivitis.

Bharati and Sharma (2012) reported that dried *Mallotus philippinensis* seed powder was applied on wound.

Bahera et al. (2013) detailed that supplementation of *Asparagus racemosus* (Shatavari) roots with grub was given to creature to build milk creation. The mammogenic property of *Asparagus racemosus* (shatavari) on udder credited for upgraded milk creation.

Mishra (2013) detailed that a few small bunches of *Azadirachta indica* (neem) and *Ocimum sanctum* leaves were ground to glue and applied as a poultice every day for three to four days.

Lone and Bhardwaj (2013) revealed that new foundations of Banparthi were squashed and tied as poultice on injuries to give quick help from torment. Leafy foods after complete drying were grounded into powder which was given to steers with water against loss of motion.

Bahera et al. (2013) revealed that *Asparagus racemosus* utilized as antidiarrhoeal in creatures.

Galav et al. (2013) observed that 150 gm of Kali Mirch (*Piper nigrum* Linn) seeds was blended in with 280 gm ghee and took care of once in a day for 3 days for right on time recuperation from mastitis.

Rajkumari et al. (2014) reported that 15-20 new leaves of *Saccharu* *officinaru* was given to creature for expulsion of placenta in cows. Additionally, 10-15 new products of *Ficus raceinosa* was given legitimately or blended in with feed for simple and fast expulsion of placenta from the belly.

Saha et al. (2014) revealed that juice arranged from the bark powder of *Holarrhena antidysenterica* (kurchi) and 6 - 10 cuts of *Carica papaya* natural products (pepe) with water, was taken care of orally threefold per day to initiate lactation in creature. Likewise, glue arranged from the entire plant (2-5 plants) of *Amaranthus spinosus* (kantakhure) alongside the roots (50gm) of *Glycosmis pentaphyla* (atiswar) was taken care of orally for initiate lactation.

Wath et al. (2014) revealed that decoction arranged from bark of both *Bombaxceiba* and *Ficus racemosa* was given to creatures experiencing maintenance of placenta.

Kulkarni et al. (2014) found that Fumigation is a well-established strategy used to repulse bugs in dairy animals shed is still performed by nearby individuals with leaves of *Artimisia vulgaris* L. furthermore, *Pogostemon benghalensis* (Burm.f.) *Chloroxylon swietenia* was used to control flies and bugs because of fumigation. Leaves of *Annona squamosa* L. were utilized for wound recuperating and creepy crawly repellent.

Wath et al. (2014) revealed that the *Cascutta* stem (*Amarwel*) was blended with feed to expand the milk creation.

Wath and Jambu (2014) detailed that wangi (*Solanum melongena*) organic products was taken care of as grain to fix foot and mouth ailments.

Gadpayale et al. (2014) detailed that leaf glue of gunja (*Abrus precatorius*) was applied on influenced spots to treat swellings while the little measure of seed powder was given in the stomach related issues.

Saha et al. (2014) detailed that 200 gm roots glue of *Rauvolfia serpentina* (Sarpagandha) alongside 200gm of *Azadirachta indica* leaves (neem) were taken care of orally.

Yadav and Gupta (2014) reported that heeng (*Ferula asafoetida*) was given in stomach-hurt and acid reflux.

Yadav (2015) revealed that a few tribal give 1-2 kg (Maize) *Zea mays* floor with roughage for multi week to incite heat in creatures. Clans announced that this treatment give warmth to their creatures and incite heat rapidly. Some of the customary healers likewise detailed that, they suggested 1-2 kg grounded seed of *Datura stromonium* (dhatura) to anestrous creatures for initiating heat inside 2-3 days.

Punjani and Pandey (2015) found that 50 gm stem pieces was blended with 50 gm base of Ankh-futaniyu (*Trichosanthes bracteata*), 5 gm product of Ajmo (*Trachyspermum ammi*) squashed by including slight normal salt and powdered product of Marcha (*Capsicum annum*), were included into 2 liters of water. This blend was separated and the concentrate were given orally two times every day for 2-3 days to stop salivation drop out from mouth caused because of foot and mouth malady.

Patil et al. (2015) detailed that *Capparis zeylanica* (Govindi) leaves were squashed and blended in with water include 250 ml of eatable oil combine and applied on cracked bone of steers. Additionally, stems *Cissus quadrangularis* (Charud) was squashed also, glue applied on broken bone in cows. At that point the cracked bone was tied with the assistance of bamboo strips and a bit of fabric. Likewise, stem was squashed and blended in with Jawar floor and arranged bolus was taken care of to creatures for mending in bone break.

Rautray et al. (2015) revealed that 50ml of juice of the leaves and product of banana were blended in water and took care of to creature day by day for 4-multi day if there should arise an occurrence of tympany. Dark papper was likewise used to assuage tympany.

Singh et al. (2015) detailed that leaves of Hunumgata was blended in with golki and half was given orally and rest half was taken care of as glue.

Punjani and Pandey (2015) reported that the glue of new leaves or leaf juice of *Annona squarnosa* (Sitaphal) applied tenderly over influenced parts two times every day to kill worms and for quick mending of cuts and wounds. Likewise, the bark of *Azadirachta indica* was squashed and blended in with slight water. The glue was applied topically over influenced zone two times every day to fix cuts and wounds.

Yadav et al. (2015) detailed that conventional healers were applied until (*Sesamum indicum*) oil on worm wounds and furthermore *Butea monosperma* seed powder was utilized to execute the slimy parasites.

Patil et al. (2015) found that leaf decoction of Ramphal (*Annona reticulata*) was orally given for devastating worms. Additionally, Leaf glue is remotely applied as a bug spray on steers. Sitaphal (*Annona squamosa*) leaves were taken care of for devastating worms in homegrown creatures. Additionally, Leaf glue was applied remotely, for devastating lice in homegrown creature. Natural product glue of Kadu-nim was remotely applied on the assortment of homegrown creature for slaughtering lice.

Galav et al. (2016) revealed that 50 gm of *Ampelocissus latifolia* tuber powder was blended in with water and took care of two times every day for three days for early recuperating of broke bone.

Patel et al. (2016) revealed that neem bark, babool bark and unpleasant gourd were utilized in eye contamination and furthermore 2% salt and Fitkari arrangement was utilized for eye flushing.

Pranjale and Dube (2016) detailed that 1-inch rhizome of *Gloriosa superba* L with wheat flour were taken care of too creature having maggoted wound.

Panda and Mishra (2016) detailed that *Brassica campestris* seed oil was directed orally to calves experiencing heartburn and shortcoming.

2.5 RECEPTION LEVEL OF IMPROVED ANIMAL HUSBANDRY PRACTICES AND ITS RELATIONSHIP WITH VARIOUS FACTORS

Singh (1991) detailed that the reception score of logical dairy developments if there should be an occurrence of individuals from town dairy helpful were high when contrasted with non-individuals

Kumar and Sah (2001) reported that appropriation of improved advancements is an essential for the business practicality of grassroots dairying. This calls for giving due significance to the information conveyance framework to guarantee ideal and satisfactory flexibly of accessibility of specialized information sources and administrations to the dairy ranchers.

Ghosh et al. (2005) revealed that reception of AI (Artificial Insemination) is profoundly related with all the socio mental factors in the two MCS (Member helpful society) and

NMCS (Non part agreeable society). It additionally uncovered that all the correspondence factors were having huge relationship with selection of A.I both in MCS and NMCS aside from the metropolitan contact in MCS. Among financial factors age was having huge negative relationship with selection of A.I on way examination, development inclination and information about deworming were demonstrated to be the key factors that legitimately and by implication impacted the appropriation of A.I in MCS and NMCS individually.

Chauhan et al. (2005) found that the size of land holding had positive also, profoundly noteworthy relationship with reception of dairy cultivating rehearses, which included improved taking care of practices, selection of improved varieties, improved administrations, improved lodging and veterinary guides. He likewise demonstrated that as the size of land holding expanded rancher's tendency towards appropriation of improved dairy cultivating rehearses was additionally expanded.

Singh (2007) reported that greater part of the respondents (57.22%) were found in medium class of reception of logical dairy farming practices.

Khode et al. (2009) found that the traits to be specific instruction and financial status were found exceptionally huge with appropriation of improved dairy steers the board rehearses. Though land size, complete yearly salary, dairy group size, day by day milk creation, every day milk deal, milk creation from bought dairy cows' social investment, use of correspondence sources, information level, mentality towards dairy cultivating, monetary inspiration and preparing on dairy cultivating were essentially associated with appropriation of improved dairy steers the board rehearses. Autonomous factors like age, family size, relative interest in dairy cultivating, number of bought dairy cows and involvement with dairy cultivating were non-fundamentally related with appropriation level of improved dairy steers the executives rehearses.

Satyavir et al. (2010) found that lion's share of the ranchers (69.50 %) had medium degree of by and large appropriation of logical dairy cultivating rehearses. Notwithstanding, the greatest percent of selection by the dairy ranchers (80.91 %) were discovered to be in instance of the creature taking care of practices followed by rearing practices (68.41 %), medical services rehearses (67.12 %) and the board rehearses (66.45 %) with the generally speaking mean appropriation of 70.75 percent of by and large logical dairy cultivating rehearses.

Murai et al. (2011) revealed that logical dairy cultivating preparing program had positive effect on appropriation of advancements by dairy ranchers notwithstanding of numerous imperatives.

Fita et al. (2012) found that the general degree of reception of improved dairy farming practices in the investigation zone was discovered to be about 50.44. Mass media introduction, preparing on dairy cultivating and information on the dairy ranchers on dairy cultivation rehearses had positive and exceptionally critical relationship with the selection of improved dairy farming practices. Instruction status and encounters of the dairy ranchers on dairy cultivating and interest of the dairy ranchers in different dairy cultivating related associations additionally had positive and huge relationship with selection of the improved dairy cultivation rehearses.

Jha (2012) reported that the zero-request connection coefficient of appropriation of IDHP by NAIP received ranchers was emphatically and altogether connected with instruction, social interest, augmentation contact, broad communications introduction, accessibility of specialized information, credit direction, preparing direction, financial status, class, information level of improved creature cultivation practices and pay at 1 % level of hugeness. A negative yet noteworthy relationship was found with occupation at 1 % level of hugeness.

Kumar et al. (2012) in his investigation reasoned that base mechanical appropriation hole that is 59.55% was acquired on account of taking care of practices, followed by the improved rearing (66.91%), the executives (69.55%) and medical care (77.68%). The outcomes uncovered that innovative data is required by all the ranchers in suggested animal farming practices.

Singha et al. (2012) found that little ranchers ordinarily had low to medium degrees of reception of dairy cultivating rehearses in chosen cultivating framework i.e., 84.44 percent in FS1 and 82.22 percent in FS2 and FS3, separately.

Bashir et al. (2013) expressed that age and long periods of involvement with creature farming were contrarily and altogether associated with degree of reception of present-day creature farming practices while crowd size and proficiency had no critical connection with degree of selection of present-day creature farming rehearses.

2.6 PERCEIVED EFFECTIVENESS OF ITK & CONSTRAINTS FACED BY THE RESPONDENT

Pandey (1996) reported that inclination for common help was the most significant requirement in reception of AI.

Meena and Chouhan (1999) found that the data with respect to improved dairy cultivating rehearses. The significant imperatives were absence of satisfactory offices for general media

helps and writing at town level. Helpless coordination among research, augmentation customer framework and absence of gratefulness from bosses for accomplishing food work.

Holloway et al. (2000) detailed that the non-accessibility of thoroughbred stock was seen most significant imperative of the dairy ranchers of east African good countries.

Podikunju et al. (2001) distinguished the limitations looked by ancestral and non-ancestral homestead ladies. The tribals discovered absence of improved sire as generally genuine limitation, while if there should be an occurrence of non tribals aftereffects of A.I. was the most significant limitation. It was likewise detailed that excessive cost of concentrate, absence of cash for logical lodging and absence of information about control of sickness were the other requirements looked by both the classes of respondents.

Kumar et al. (2001) reported that larger part of the respondents was found to be encountering moderate degree of requirements in selection for SDFPs. The degree of requirement was 50.48 and 46.08 % as experienced by recipients and nonbeneficiaries, individually. Degree of requirements was most extreme in reproducing and least in the board among the two classes of respondents.

Narendrareddy et al. (2003) found that non-accessibility of good dairy creatures, non-gainful cost for milk, significant expense of concentrates and non-accessibility of green feed, significant expense of dairy creatures, sporadic instalment for milk by obtaining offices, low water profiles and absence of water system offices and nonavailability of good reproducing bulls were the significant limitations in dairy cultivating.

Singh (2007) in his investigation reasoned that significant expense of concentrate blend (93.33%), significant expense of present-day medication (87.77%), issue of anestrous and rehash rearing in dairy creature (84.44%), lower cost of milk (67.77%) were communicated as the most genuine imperatives by the khatal proprietors. While absence of direction (preparing offices) about the administration of milch creatures (65.55%), trouble in getting advance (57.77%) and charging extravagant sum by the veterinarian (47.77%) were not kidding requirements communicated by the khatal proprietors. Disregard by the veterinarians (21.11%) and absence of drinking water office (21.11%) were too viewed as limitations by the khatal proprietors.

Patil et al. (2009) detailed that greater part of the respondents (72.44%) expressed their imperative as low milk creation from the neighborhood breeds, 45.33% as lack of green grain and 41.33% as absence of clean water while 25.33% expressed absence of conservation office as their imperative. Alluding to the budgetary limitations, 78.22% respondents expressed their requirement as postponement in milk installment, 63.11% as deficient cash

and absence of credit office though significant expense of concentrates as the imperative by 56.44% of the respondents. As respects specialized limitations, greater part of the respondents (68.00%) has expressed their limitation as deficient information on sicknesses, their counteraction and control while 56.89% have alluded their requirement as non-accessibility of veterinary administrations.

Murai and Singh (2011) revealed that the imperatives experienced by the ex-learners are the helpless aftereffects of A.I., non-accessibility of mineral combination in the territory absence of information on normal infectious maladies, their causes and control in appropriation of logical dairy cultivating rehearses. Though, for non-students additionally poor aftereffect of A.I., absence of information on normal infectious illnesses, their causes and control measures and non-accessibility of mineral combination in the region.

Kumar et al. (2012) found that in his investigation that non-utilitarian AI focus, non-accessibility of immunization and veterinary medication in government clinics, continue reproducing, inclinations to money or food crops instead of feed crop, ignorance about suggested taking care of practices, non-accessibility of HYV of grub seeds, helpless accessibility and significant expense of compound feed, mineral combination, absence of veterinary specialists and absence of information about logical administration and medical services of dairy creatures rehearses were seen as the significant limitations in receiving improved dairy cultivating rehearses by dominant part of respondent.

Mohapatra et al. (2012) reported that the significant requirements looked by ancestral dairy business people were significant expense of concentrate (96.67%), absence of accessibility of veterinary writing in the town (79.67%). non-gainful cost for milk (100%), the issue of helpless water system offices for developing feed crops for the animal's creatures (62.50%).

Raval and Chandawat (2012) revealed that greater part of dairy ranchers had monetary issues and issues identified with the board works on, taking care of rehearses. Not many of the respondents confronted issues with respect to advertising.

Sabapara et al. (2012) found that Majority of the ancestral respondents in the study territory were poor and significant limitations watched identified with lodging, taking care of, rearing and draining administration rehearses were absence of own capital, significant expense of feed, occurrence of continue rearing, and non-profitable cost for milk, separately.

Datt et al. (2013) revealed that these grassroots developments were having savvy, more prominent utility and more practical than accessible innovation.

Bhanotra et al. (2016) observed that "locally and effectively accessibility of therapeutic plants" was the most significant seen factor for selection of indigenous specialized

information by the dairy ranchers for treatment of their animals followed by "profound information on the ranchers with respect to ITKs".





RESEARCH METHODOLOGY

Chapter-3

RESEARCH METHODOLOGY

Research methodology is considered to be blue print of the research architect. In social science the term “methodology” is applied to know about how are carried out the process of research. To conduct the process of investigation scientifically a suitable research design was evolved in order to get meaningful conclusions. In this chapter an attempt has been made to explain the various methods and procedures followed to investigate the problems under the following sub-heading:

3.1 Introduction of fact finding.

3.2 Locale of the study.

3.3 Sampling design.

3.4 Variables and their measurements.

3.5 Data collection.

3.6 Statistical methods used.

3.1 INTRODUCTION OF FACT FINDING

It was viewed as vital for experience accessible writing including books, journals, bulletins, periodicals, leaflets and so on to have a sound hypothetical foundation of the chose issue. Meeting with the nearby Tharu ancestral ranchers, block authorities, expansion specialists likewise helped in having more knowledge of the Tharu ancestral circumstance and enthused to have an investigation of such individuals who were viewed as misused and denied of formative advantages.

Based on hypothetical foundation, in this way gained a framework of the proposed study was prepared expressing these in the title of the investigation, proclamation of the issue, goals and plan of exploration, strategies for information assortment and measurable examination.

3.2 LOCALE OF THE STUDY

Accomplishment of any friendly exploration relies on direct correspondence between the scientists and the respondents to build good rapport and to ensure free and frank expression of the responses. For this reason, the researcher's own state to be specific, Bihar was chosen for the proposed study.

3.2.1 Universe of Study

Selection of state: The study was conducted purposively in the Bihar state considering about the fact of familiarity of the researcher with the local dialect and accents of the farmers. This proved to be immense help for compatibility or, rapport building and easy access to source of information. Bihar is the third populous state in India. The state with an area of 94.16 lakh hectares lies between latitudes N. 24° 20' 10" and 27° 31' 15" and longitudes E 83° 19' 15" and 88° 17' 40". The state is bounded on the north by Nepal, on the east by West Bengal, on the west by Uttar Pradesh and on the south by Jharkhand. The state lies between 35 to 85 meters above the mean sea level. The state comprises of two distinct zones viz. North Bihar and South Bihar. The River Ganges separates the States in the north and south.

The state is divided into three agro- ecological zones, these are North-West Alluvial Plains (Zone-I), North-East Alluvial Plains (Zone-II), and South Bihar Alluvial Plains (Zones-IIIA and IIIB). The natural resources in the endowments of the states are dominated by land and water. These resources are vital for the development of Agriculture, Animal Husbandry and Fisheries in the state. After bifurcation Bihar is left with few industries. Agriculture and livestock are the main occupation of people of Bihar.

Table-1. State Profile:

1.	Latitude	N. 24 ⁰ 20' 10" and 27 ⁰ 31' 15"
2.	Longitude	E 83 ⁰ 19' 15" and 88 ⁰ 17' 40"
3.	Height from Mean Sea Level	173 feet
4.	Average annual rainfall	1205 mm
5.	Major River	Ganga, Gandak, Kosi, Bagmati, Mahananda, Sone.
6.	Total land	28.20 Lakh Acres
7.	Forest	6764.14 sq. km
8.	Total No. of Districts	38
9.	Total Cattle	15311.17 Thousand
10.	Total Buffalo	7719.79 Thousand
11.	Total Bovine	13034.60 Thousand
12.	Total Poultry	16525.35 Thousand
13.	Total Livestock	36454.0 Thousand

Source: - Basic Animal Husbandry Statistics 2019.

3.2.2 Selection of the Districts

The investigation was led purposively in the Tharuhat region in West Champaran district of Bihar. West Champaran is one of the 38 districts of Bihar and Bettiah city is the administrative headquarter of this district. It is a part of Tirhut Division. It occupies an area of 5228 Sq.KM. It is located between 26⁰ 16' to 27⁰ 31' N latitude and 83⁰ 50' to 85⁰ 18' E longitude. It is bounded on the north by the hilly region of Nepal, on the south by Gopalganj district and part of East Champaran district, on the west by state of Uttar Pradesh and on the east by part of East Champaran district and Nepal. The Tharu clans are for the most part found in four Block of West Champaran in particular Bagha-2, Ramnagar, Gaunaha, and Mainatand. These locales are all things considered called "Tharuhat". The number of inhabitants in Tharu clan is 2.56 lakhs. It contributes about 0.25 percent of state population. Tharuhat shows the geological territory of 1500 sq. km. of West Champaran (GOI, 2012).

These clans have been chosen since this clans have consistently stayed in segregation, the reception of deductively demonstrated creature farming advances is nearly less, and the financial parts of domesticated animals' proprietors of this district are exceptionally poor. The quantity of animals per rancher is exceptionally enormous yet their efficiency is

extremely less consequently odds of getting countless indigenous technical knowledge by and by are better.

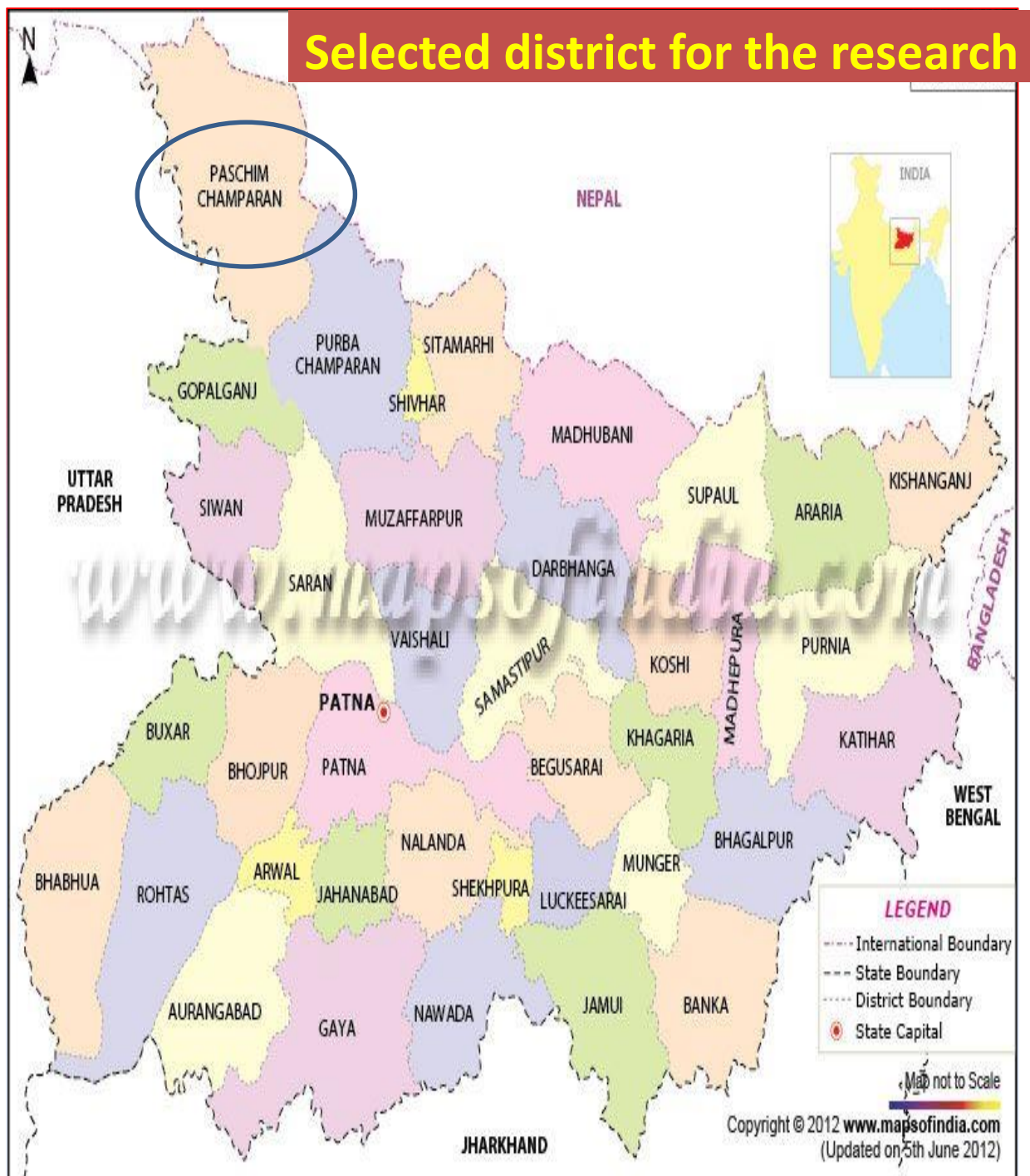
Tharu Tribes of Bihar has an extremely rich legacy of indigenous wellbeing security and treatment frameworks that have been utilized in ease treatment and other related perspectives both in human just as creatures by them since the ages. There are numerous conventional healers in Tharuhat who are learned and experienced in customary frameworks of treatment however their insight isn't recorded rather sent orally starting with one age then onto the next.

Figure-1 MAP OF INDIA HIGHLIGHTING THE STATE



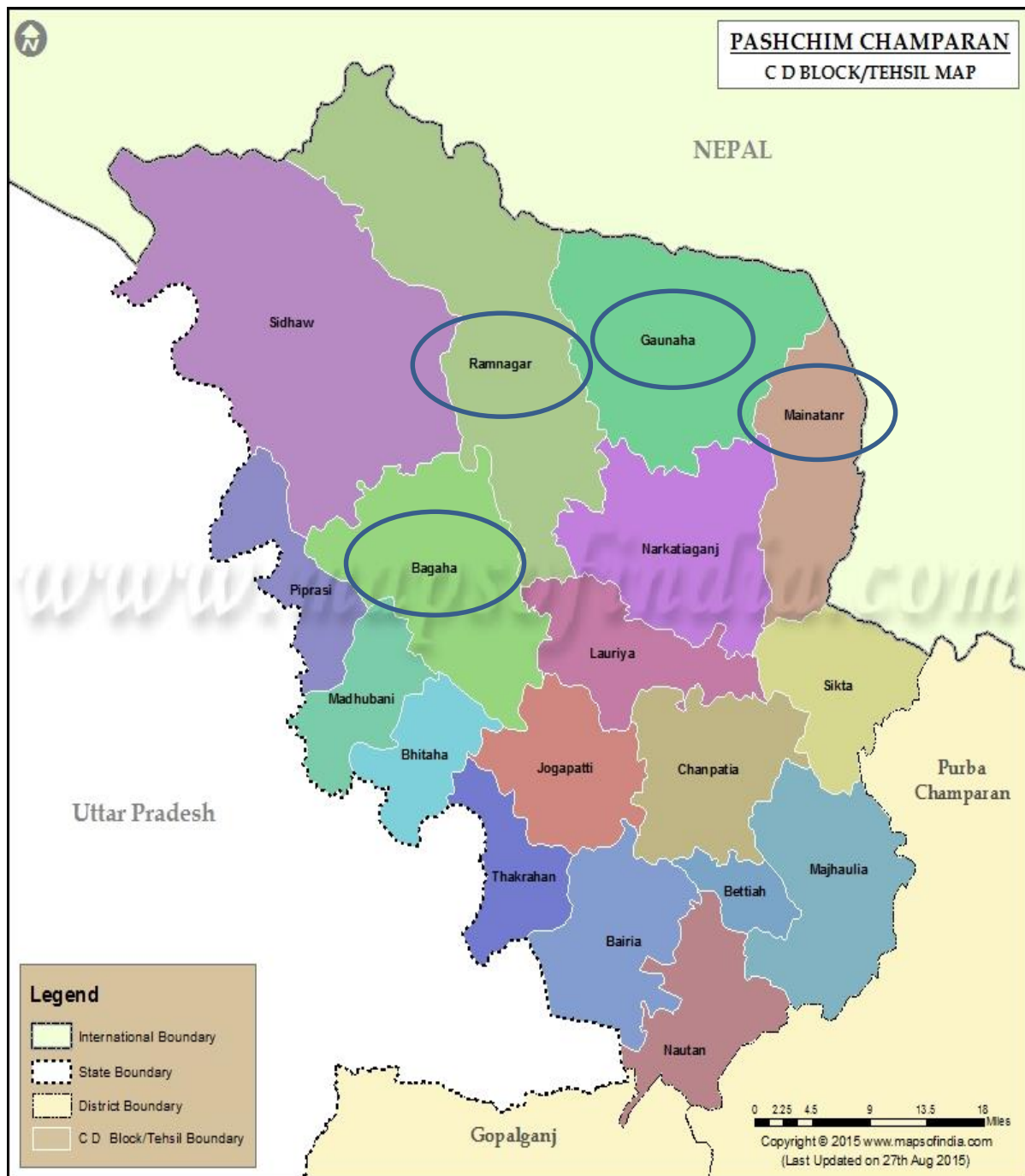
Source: www.mapsofindia.com

Figure-2 MAP OF BIHAR INDICATING SELECTED DISTRICT FOR THE RESEARCH STUDY



Source: www.mapsofindia.com

**Figure-3 MAP OF WEST CHAMPARAN DISTRICT INDICATING
SELECTED BLOCK FOR THE RESEARCH STUDY**



Source: www.mapsofindia.com

Table-2 Profile of West Champaran district of Bihar

1.	Geographical location	Latitude 26 ⁰ 16' N to 27 ⁰ 31' N Longitude 83 ⁰ 50' E to 85 ⁰ 18' E
2.	Area	5,228 Sq. KM (2,019 Sq. Mi)
3.	Forest Area	917.45 Sq. KM
4.	Agricultural Area	2084.52 Sq. KM
5.	Total Blocks	18
6.	Height from Mean Sea Level	65 Mtr. (213 ft)
7.	Average annual rainfall	1510.4 mm
8.	Major River	Gandak or Narayani and Sikrahana or Little Gandak.
9.	Population	3,935,042
10.	Tharu Tribes Population	2.56 Lakhs
11.	Population Density	750/Sq. KM (1,900/Sq. Mi)
12.	Literacy rate	58.06 %
13.	Major soil types	Sandy loam
14.	Agro-climatic Zone	Zone-1
15.	Major crops	Paddy, Wheat, Sugarcane and Arhar
16.	Total cattle population	4,11,203 (census-2019)
17.	Total buffalo population	2,72,643 (census-2019)
18.	Total goat population	7,05,184 (census-2019)
16.	Total livestock population	13,99,492 (census-2019)

Source: Ground Water Information Booklet West Champaran District, Bihar State

3.3 SAMPLING DESIGN

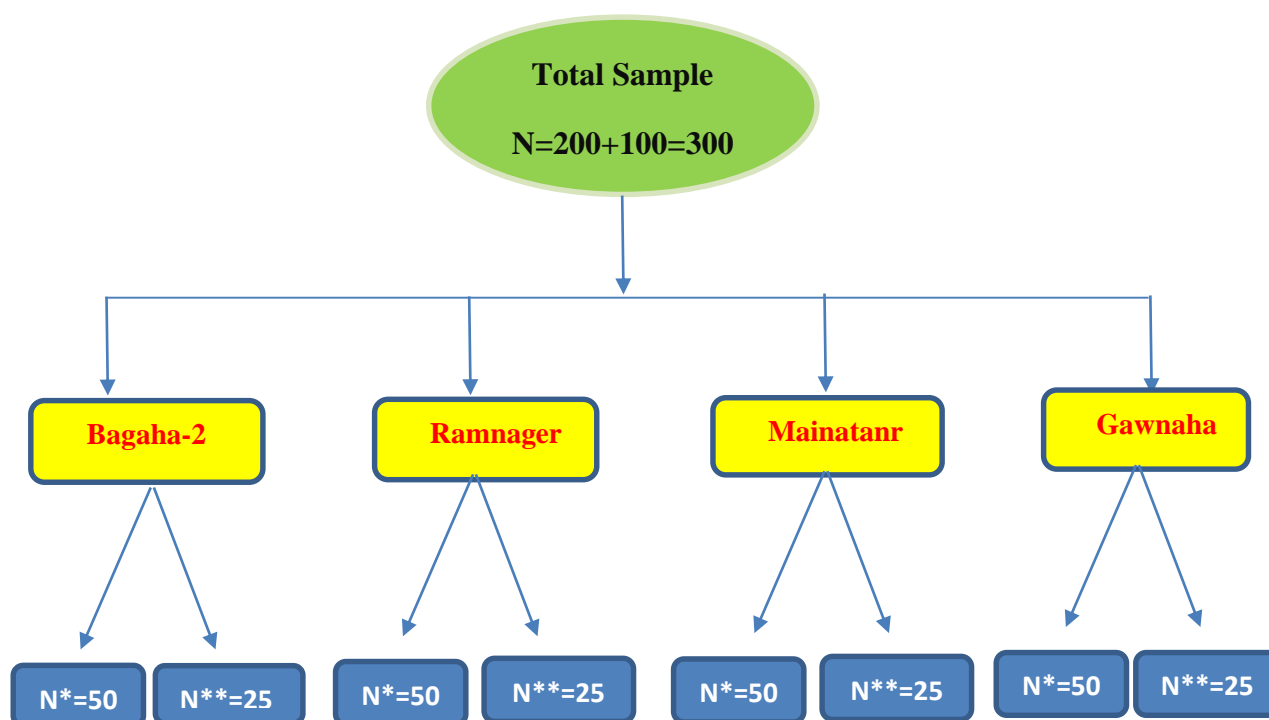
Bihar state consists of 38 districts out of which West Champaran district was selected purposively. Out of 18 blocks of West Champaran district, four blocks which were having substantial higher Tharu tribal population namely, Bagha-2, Ramnagar, Gaunaha, and Mainatand were purposively selected for study on the basis of demographic distribution of Tharu tribes. After selecting block, a list of farmers who belong to Tharu tribes had at least one livestock animal and practising ITK was prepared from each block. From the list 50 livestock owners which are known to use of ITK's and 25 traditional healers which were considered to be knowledgeable in ITK's in animal husbandry in surrounding Tharuhat areas were selected randomly with the help of local community leaders (Gumasta) and staffs of veterinary hospitals and NGOs from each block. Thus, all together 200 livestock owners and 100 traditional healers (300 respondents) were identified for the study.

The data were collected in two phases using a pre-tested interview schedule. In the first phase the researcher made informal visits to the selected blocks in Tharuhat area. During these visits the researcher has explored the general information about understanding of the used indigenous technical knowledge (ITK) in animal husbandry like personal and socio-economic characteristics, communication and documentation of ITK. In 2nd phase researcher has explored the awareness and adoption of ITK among livestock owners and their effectiveness in Tharuhat area.

3.3.1 DIRECT OBSERVATION

It is fundamentally noticing objects, occasions, processes, individuals and recording these perceptions. Direct perception is a decent method to cross-check respondents' answers. (Beam and Mondal, 2004). The predominance of illnesses of livestock animals and the treatment given by respondents during the time of study was seen in the sample Tharuhat area and noted. For the current investigation perception was accomplished for identification and selection use and effectiveness of ITKs and for understanding traditional information frameworks prevailing the area under the study.

Figure-4 SAMPLING PLAN OF THE STUDY



*** = Number of livestock owners.**

**** = Number of traditional healers.**

3.3.2 SEMI-STRUCTURED INTERVIEW SCHEDULE

It is one of the principle tools utilized in participatory research. Here, rather than formal plan an agenda of inquiries as adaptable guide is utilized. The majority of the inquiries were defined during the meeting, as in a journalistic interview (Ray and Mondal, 2004). Interview schedule was used as a tool, it may be defined as a formal list, a category or inventory and it may be added that it is a counting device used in formal and standardized inquiries or, investigation the sole purpose of which is aiding the collection of quantitative cross sectional data. The respondents were interviewed through semi-structured interview schedule prepared for the purpose. It was divided into two major sections. The schedule consisted of questions related to different personnel and socio-economic variables (Age, Education, Occupation, Family size, Land holding, Herd size and Annual income), communication characteristics (Extension agency contact, Mass media exposure, and informal source of information) and documentation of indigenous technical knowledge (ITK).

In second section, interview schedule had structured questions regarding the awareness of ITK, adoption of ITK and their perceived effectiveness of ITK in six broad area viz., Cost, Simplicity/complexity, Availability/accessibility, Adaptability, Rationality and Sustainability. The schedule was used for data collection from Tharuhath area.

Figure-5 Data collection by the researcher



Figure-6 Data collection by the researcher



Figure-7 Data collection by the researcher



3.3.3 Collection and documentation of indigenous technical knowledge from tharu tribes

A detailed discussion with the traditional healers and livestock owners was conducted on various indigenous technical knowledge practised in animal husbandry in the tharuhat areas. The data about indigenous technical knowledge was taken from optional sources just as through perceptions. The data was likewise gathered from veterinary officials, researcher, domesticated animals' proprietors and non-government associations like Jeewika members and community leaders (Gumasta). The gathered indigenous technical knowledge was reported completely with the assistance of specialists. From that point onward, all the selected indigenous technical knowledge were indeed uncovered among traditional healers just as animals' proprietors to distinguish the most normally utilized indigenous technical knowledge for different animal husbandry practices. Those animal husbandry ailments were chosen which were most normally utilized in their animals by the domesticated animals' owners. The chose indigenous technical knowledge experienced for ten different generally happening animal husbandry practices were diarrhoea, fever, fracture, constipation, pneumonia, bloat, gastrointestinal parasites, foot and mouth disease, wound and parasitic infestation.

To affirm the plants or different fixings used to recuperate the afflictions in creatures, they were mentioned to show and perceptions were made to know the genuine strategy of use in the greater part of the cases. The name of plants and substances utilized in different ITKs which were accounted for by customary healers in local dialect had been later on discussed about with subject matter expert and their listing was done.

3.5 VARIABLES AND THEIR MEASUREMENTS

For any examination attempted in social research, it is standard to absolutely specify the factors utilized for the examination with their working ideas and estimation techniques. After the collection of review of literature and consultation with the specialists, relevant variables were chosen for the investigation.

Table-3 Shows the selected variables and tools and techniques used for their measurement.

Sl.NO.	Variables	Measurement
A.	Personal and socio-economic characteristics	
01.	Age	Schedule developed for the purpose.
02.	Education	
03.	Occupation	
04.	Family size	
05.	Land holding	
06.	Herd size	
07.	Annual income	
B.	Communication characteristics	
01.	Extension agency contact	Scale adopted by Mahto (2012) with suitable modification.
02.	Mass media exposure	
03.	Informal source of information	
C.	Documentation of ITK’s	Schedule developed for the purpose.
D.	Awareness of ITK’s	Schedule adopted by Kumar (1997) with slight modification.
E.	Adoption of ITK’s	Schedule adopted by Kumar (1997) with slight modification.
F.	Perceived effectiveness of ITK’s	
01.	Cost	Scale adopted by Mahto (2012) with suitable modification.
02.	Simplicity/complexity	
03.	Availability/accessibility	
04.	Adaptability	
05.	Rationality	
06.	Sustainability	

3.5.1 PERSONAL AND SOCIO- ECONOMIC CHARACTERISTICS

3.5.1.1 Age

It refers to the approximate age of the livestock owners and the traditional healers of Tharu tribes at the time of information assortment and it was controlled by direct questioning. The respondents were ordered on the accompanying three classes as follows:

Sl. No.	Category	Frequency
1.	Young(Up to 30)	
2.	Middle(30-50)	
3.	Old(Above 50)	

3.5.1.2 Education

It refers to the process that bring desirable changes in behaviour, knowledge, skill, attitude and action of respondent one has to undergone effective learning experience for desirable changes. It was measured by questioning the respondents directly. The respondent were classified on basis of educational groups namely illiterate, schooling up to the primary, high school levels and graduation and above. The scoring was done as per the following method:

Sl. No.	Education level	Score
1.	Illiterate	0
2.	Primary school	1
3.	High school	2
4.	Graduate and above	3

3.5.1.3 Occupation

This refers to family's monetary exercises to acquire a livelihood. The monetary exercises were occupation. Further, occupations, viz. labour, agriculture, animal husbandry, business and service were enlisted. From the rundown, the livestock owners and traditional healers of the Tharu tribes were asked to indicate their occupation. It was measured with the help of following frequency method.

Sl. No.	Occupation	Frequency
1.	Labour	
2.	Agriculture	
3.	Animal Husbandry	
4.	Business	
5.	Service	

3.5.1.4 Family size

Family size refers to the number of people living under a similar rooftop and sharing kitchen together in a family. It was measured by the schedule developed, by the presence of actual number of members in the family. The Tharu tribes were arranged into three categories small, medium and large categories as follows:

Sl. No.	Category (No. of members)	Frequency
1.	Small (up to 5 members)	
2.	Medium (6 to 9 members)	
3.	Large (above 9 members)	

3.5.1.5 Land Holding

It was operationally characterized as the total number of hectares of land possessed and rented in by an individual family at the time of examination. It was resolved by a timetable created for the poupose. The respondents were arranged into marginal, small, medium and large categories as follows:

Sl. No.	Category	Frequency
1.	Marginal(Less than 1 ha)	
2.	Small(1-2 ha)	
3.	Medium(2- 4 ha)	
4.	Large(More than 4 ha)	

3.5.1.6 Herd size

Herd size refers to the number of total animal viz. Cattles, buffaloes, goats, sheep and other livestock of a respondent at the time of investigation. It was estimated by giving unit score to each.

The respondents were categorized in three groups as:

Sl. No.	Category	No. of Livestock
1.	Small	Less than 10
2.	Medium	10 to 20
3.	Large	20 and above

3.5.1.7 Annual income

It is operationally characterized as the pay produced from different sources in one year. Earnings from various ventures were asked from the respondents with the assistance of the developed schedule for something very similar. Respondents were classified into low, middle and high categories on the basis of total annual income.

Sl. No.	Annual income (Rs)	Frequency
1.	Low(Less than 21,000)	
2.	Medium(21,000 to 40,000)	
3.	High(Above 40,000)	

3.5.2 COMMUNICATION CHARACTERISTICS

3.5.2.1 Extension agency contact

It refers to the degree of contact made by the respondents with the change specialists, for example, animal husbandry officer, scientist, milksuperviser, Jiwika workers. This was measured by using a schedule developed for this purpose. The response of the respondents was obtained on three point continuum i.e. mostly, sometimes and never and score of 2, 1 and 0 were assigned respectively. Finally all the extension agency contacts were ranked as per their scored obtained.

3.5.2.2 Mass media exposure

Mass media exposure is the degree to which an individual is exposed to the mass media viz. radio, television, newspaper, magazine, poster, kisan mela, pradarshani and other with respect to an innovation. This was measured by using a schedule developed for this purpose. The response of the respondents was obtained on three point continuum i.e. mostly, sometimes and never and score of 2, 1 and 0 were assigned respectively. Finally all the mass media exposure were ranked as per their scored obtained.

3.5.2.3 Informal information sources used

It refers to the level of usage of informal information sources viz. family individuals, neighbor, vaidh, ojha, mukhiya, and others. The level of contact among respondents was estimated on a 3-point continuum i. e. 2, 1, and 0 which were appointed for mostly, sometimes and never respectively. Finally all the informal information sources were ranked as per their scored obtained.

3.6 DATA COLLECTION

The analyst being a veterinarian had exploited his expert abilities to set up great affinity or good rapport with the farmers. Prior to social event information the specialist had visited the selected blocks. The need and significance of the investigation was disclosed to them in informal discussion sessions. The information was gathered from the randomly selected respondents of the selected blocks with the assistance of a meeting guide or with the assistance of a semi-structured interview schedule keeping in see the goal of the examination. The information was additionally gathered by means of observation method, informal discussion and participatory rural appraisal (PRA) technique.

The information was collected from randomly selected respondents in order to study their profile, documentation of ITKs, and extent of awareness, adoption and perceived effectiveness of ITK as well as to identify the source and channels of diffusion of knowledge among traditional healers and livestock owners.

3.6.1 Determination of the extent of awareness and adoption

Adoption and awareness are a very complex process. Roger and Sheomaker (1971) defined that adoption “as a decision to make full use of an innovation”. In the current investigation, adoption refers to that stage in the diffusion process where decision making is complete

regarding the use of the practices and action with regard to such a practice commences. However, adoption in the current study refers to “use adoption” of improved indigenous technical knowledge (ITK) practices.

An adoption scale was used to measure the extent of adoption of different improved ITK’s practices by respondents. As it was mention earlier that the different ITK’s practices were selected after thorough discussion with different experts. Selected respondent were asked to indicate the practices adopted by them. A score of ‘1’ was given to a respondent for adoption of a particular ITK’s practice and ‘0’ was given if any respondent not adopting. The total number of improved ITK’s practices were computed in terms of percentage with the help of following formula-

$$\text{Extent of Adoption of Given ITK's practices} = \frac{\text{Scores obtained}}{\text{Maximum possible scores}} \times 100$$

Based upon the percent of adoption score, the respondents were further categorised into the following four groups:

Sl. No.	Category	Level of adoption in percentage
1.	Low	0-25
2.	Medium	26-50
3.	High	51-75
4.	Very High	76-100

3.6.2 Perceived effectiveness of itk among livestock owners in tharuhath area

The perceived effectiveness of indigenous technical knowledge (ITK) was studied among randomly selected livestock owners for a number of animal husbandry practices. The perceived effectiveness of ITK was studied with six attributes viz., cost, simplicity/complexity, availability/accessibility, adaptability, rationality and sustainability. These six attributes were studied for each ITK and responses was recorded on three point continuum i.e., Most effective, Somewhat effective and Not effective at all with respective

assigned scores '2', '1' and '0' respectively. Finally the perceived effectiveness score for each ITK was calculated through summation of score value given by the respondents for each indicator.

Then respondents were categorised in low, medium and high perceived effectiveness categories for each ITK.

3.6.2.1 Cost

The expense of each indigenous technical knowledge (ITK) is operationalized as far as domesticated livestock owners and traditional healer's perception among tharu tribes of the complete expense they need to cause in the selection of every animal husbandry practice.

3.6.2.2 Simplicity/Complexity

The simplicity/complexity of ITK is operationalized regarding the livestock owner's and traditional healer's perception of the trouble in utilizing the package of the practices in animal husbandry.

3.6.2.3 Availability/Accessibility

The availability/accessibility of each indigenous technical knowledge (ITK) is operationalized as far as domesticated livestock owners and traditional healer's perception among tharu tribes about the state, condition or quality of an object which makes it be possible, reachable, or approachable for use in their animals.

3.6.2.4 Adaptability

The adaptability of indigenous technical knowledge (ITK) is operationalized regarding its ability 'to alter an individual or social orders by making them adaptable or versatile or recognizable as indicated by their social conditions.

3.6.2.5 Rationality

The rationality of ITK is operationalized in terms of livestock owner's and traditional healers among tharu tribes beliefs, opinions or a statement of reasons that influence them directly or indirectly for adoption of ITK in their animals. Besides cost, complexity, accessibility,

adaptability and sustainability it also includes education, gross monthly income, social participation and innovativeness of the respondent etc. to judge the rationality of ITK.


3.6.2.6 Sustainability

The sustainability of each ITK is operationalized as far as domesticated livestock owners and traditional healer's perception among tharu clans with respect to outfitted narrative trial verifications of native innovation supported by local healers and their ancestors since generations in their animals.

3.7 STATISTICAL METHODS USED.

In order to get logical interpretation, the information were tabulated and subjected to simple statistical tools such as frequency, mean, percentage, equal interval method, as and when required to get the meaningful interpretation.





RESULTS AND DISCUSSION

Chapter -4

RESULTS AND DISCUSSION

The present chapter contains the results got from examination of information gathered from the various respondents as per the targets of the investigation followed by discussion. The results have been introduced under the following sub-heading.

4.1 Personal and Socio-economic characteristics of Tharu tribes of Bihar.

4.2 Sources and channels of communication of indigenous technical knowledge (ITK).

4.3 Collection, documentation and screening of indigenous technical knowledge (ITK) from Tharu tribes of Bihar.

4.4 Extent of awareness and adoption of indigenous technical knowledge (ITK) among Tharu Tribes of Bihar.

4.5 Perceived effectiveness of indigenous technical knowledge (ITK) among Tharu Tribes of Bihar in terms of cost, simplicity/complexity, availability/accessibility, adaptability, Rationality and sustainability.

4.1 Personal and Socio-economic characteristics of Tharu tribes of Bihar:

This section deals with personal and socio-economic characteristics of the livestock owners and the traditional healers from whom data collection is performed for perceived effectiveness of indigenous technical knowledge (ITK), sources and channels of information of indigenous technical knowledge(ITK), transfer and dissemination of indigenous knowledge etc. among Tharu tribes Bihar taken under research study. The distribution of the respondent are as follows:

4.1.1 Age

Table-4 Distribution of the respondents according to their Age

SI. No.	Age (years)	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 200	N**= 100
1.	Young (< 30)	10 (20)	1 (04)	17 (34)	2 (08)	12 (24)	1 (04)	16 (32)	2 (08)	55 (27.50)	06 (06.00)
2.	Middle(30-50)	22 (44)	5 (20)	20 (40)	7 (28)	23 (46)	6 (24)	19 (38)	8 (32)	84 (42.00)	26 (26.00)
3.	Old (> 50)	18 (36)	19 (76)	13 (26)	16 (64)	15 (30)	18 (72)	15 (30)	15 (60)	61 (30.50)	68 (68.00)

(Figures in parenthesis indicates percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

The results of this study table-4 uncovered that majority of the livestock owners of Tharu tribes in Bagaha-2 block (44%), Ramnager block (40%), Mainatanr block (46%), Gawnaha block (38%) were under the category of middle age group ranging from 30 to 50 years of age. However the pooled data depicted that 42.00 per cent respondent were under middle age (30-50 years) followed by 30.50 per cent and 27.50 per cent in old age (>50 years) and young age (<30 years) group respectively. It might be due to involvement of middle age group generation (30 to 50 years) in animal husbandry and allied sectors due to rural unemployment and their livelihood issues in local situation.

Further table-4 revealed that the majority of the traditional healers belongs to old age group ranging from (> 50 years) in the respective blocks viz. Bagaha-2 block (76%), Ramnager block (64%), Mainatanr block (72%), Gawnaha block (60%). The average age was found to be 68.00 per cent falls into the old (> 50 years) age category followed by 26.00 per cent in middle (30-50 years) age category and 06.00 per cent belonging to young (< 30 years) age category. The table depicts that the traditional healers achieve their perfection after getting years of experience from their elders and younger people had believe on them in their old age due to greater experience.

Fig.-8 Distribution of livestock owners according to their Age

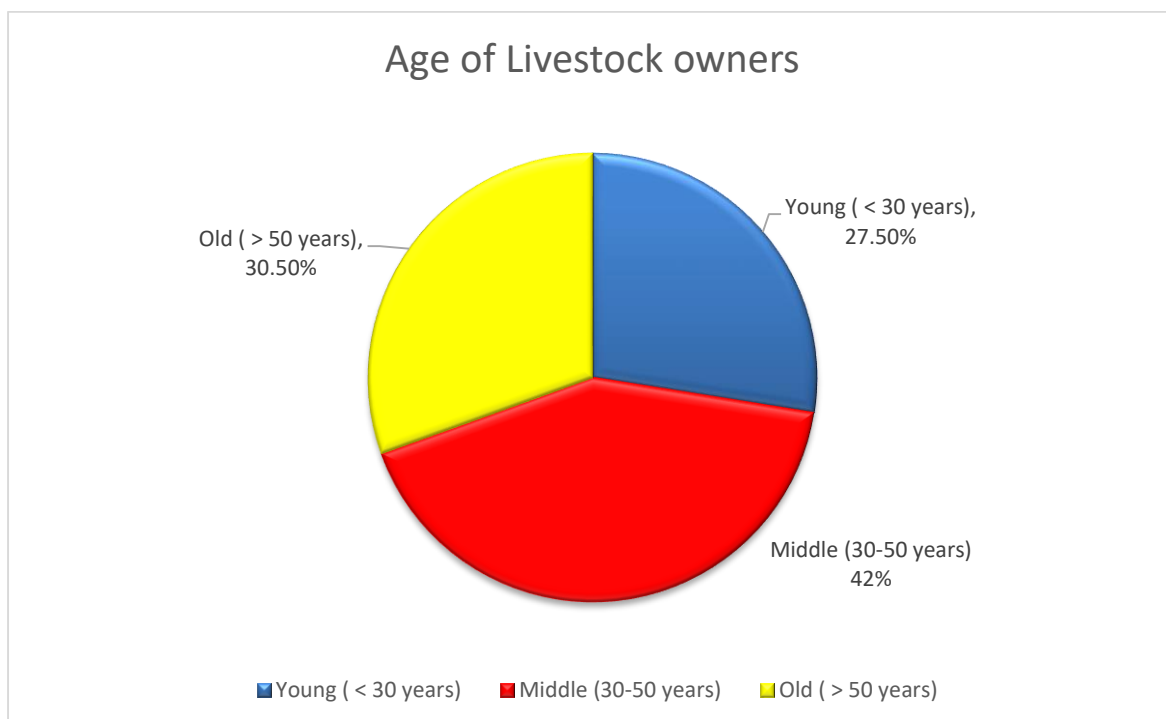
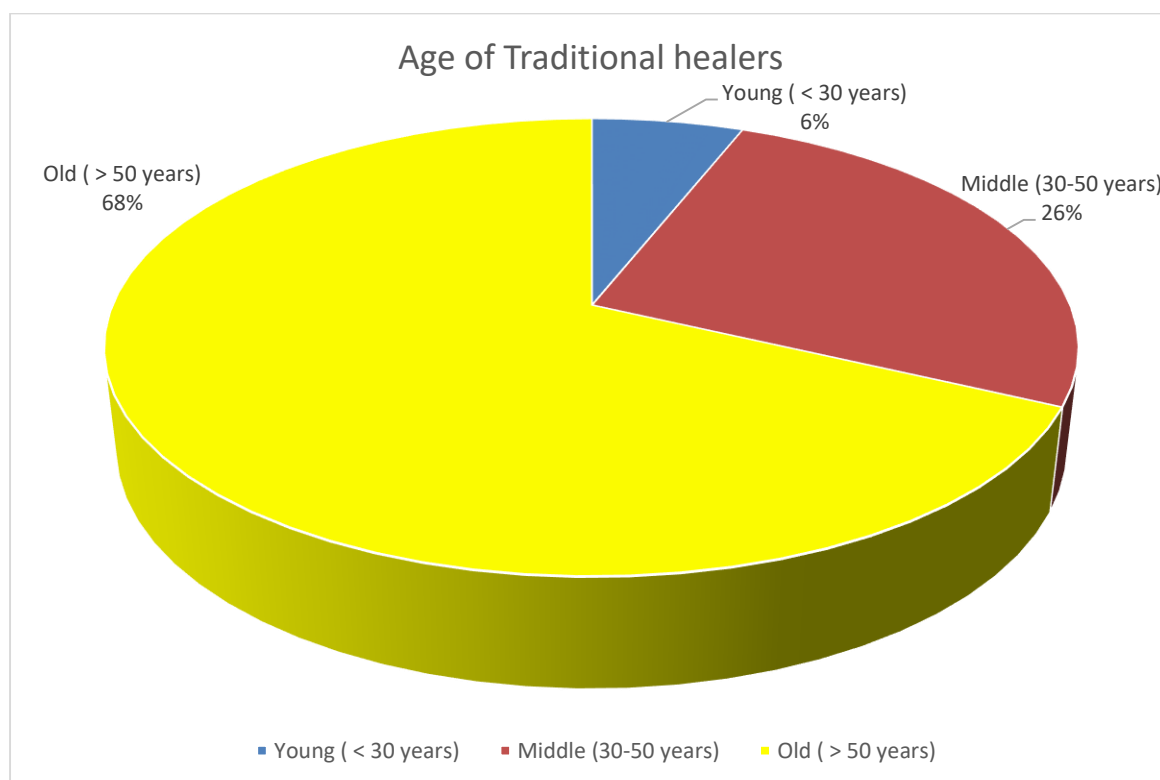


Fig.-9 Distribution of traditional healers according to their Age



4.1.2 Education

Educational level has been considered as an important contributor for personal and socio-economic upliftment of any society. An attempt has been made to analyse the educational status of the Tharu tribes under study.

Table-5 Distribution of respondent (livestock owners and traditional healers) as per their Education

SI. No.	Education Level (score)	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 200	N**= 100
1.	Illiterate (0)	10 (20)	05 (05)	08 (16)	04 (04)	13 (26)	17 (17)	18 (36)	15 (15)	49 (24.50)	41 (41.00)
2.	Primary School (1)	19 (38)	11 (11)	23 (46)	13 (13)	15 (30)	05 (05)	21 (42)	06 (06)	78 (39.00)	35 (35.00)
3.	High school (2)	15 (30)	07 (07)	17 (34)	06 (06)	13 (26)	02 (02)	10 (22)	03 (03)	55 (27.50)	18 (18.00)
4.	Graduate and Above (3)	06 (12)	02 (02)	02 (04)	02 (02)	09 (18)	01 (01)	01 (02)	01 (01)	18 (09.00)	06 (06.00)

(Figures in parenthesis indicates percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

Table-5 the pooled data reveals that the majority of the livestock owners of Tharu tribes (39.00%) had education up to primary school level followed by 27.50 per cent livestock owner had education up to high school level, 24.50 per cent of the livestock owners were illiterate and only 09.00 per cent livestock owner had education up to graduate and above. It can be seen that maximum number of the livestock owner of Tharu tribes were educated up to primary school education level.

Table-5 uncovers that the majority of the traditional healers of the Tharu tribes (41.00%) were illiterate followed by 35.00 per cent had education up to primary school level, 18.00 per cent had education up to high school level and only 06.00 per cent of the traditional healers had education up to above graduate level. It is observed that maximum number of the traditional healers of Tharu tribes were under illiterate educational status group. This trend was probably due to their ignorance towards education system in the locality which can attract and motivates them towards personal education.

Fig.-10 Distribution of livestock owners according to their Education

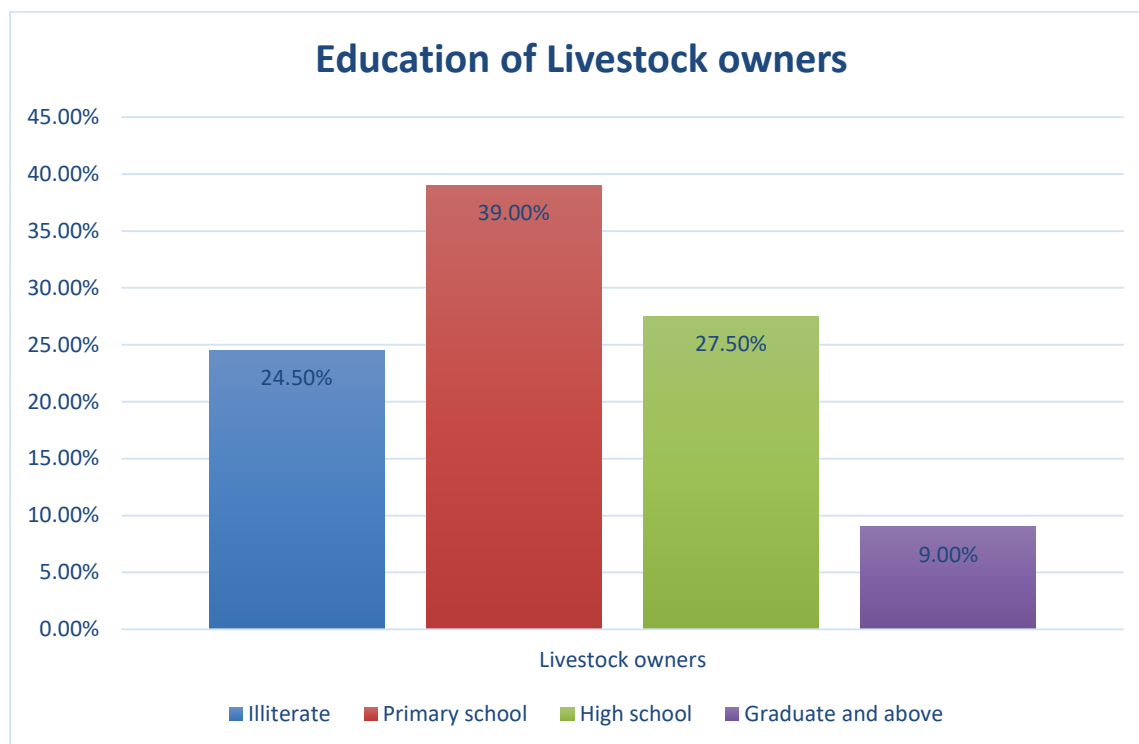
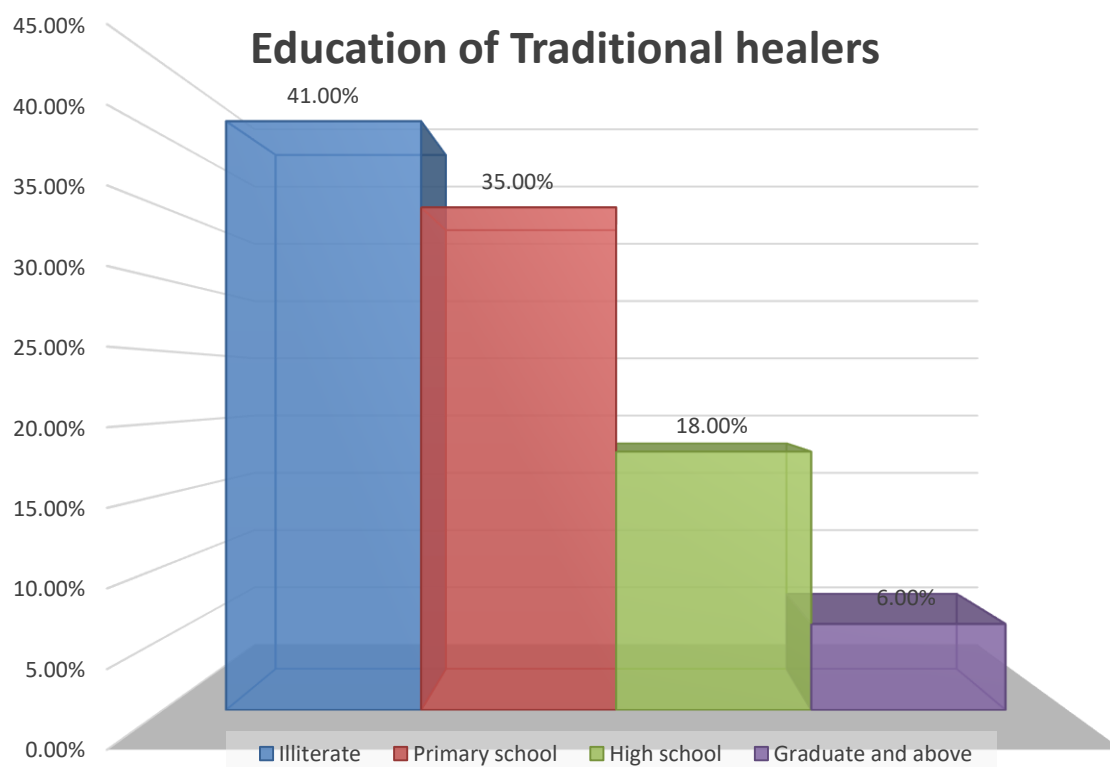


Fig.-11 Distribution of Traditional healers according to their Education



4.1.3 Occupation

Occupation refers to the mean of livelihood for an individual or a family. Individual occupation of Tharu tribes do have a bearing of an individual , his or her socialization in a particular fashion which in turn reflects his/ her pattern of behaviour of understanding and practising any indigenous technical knowledge (ITK) among animal husbandry sector.

Table-6 Distribution of the respondents (livestock owners and traditional healers) according to their occupation

SI. No.	Occupation	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 200	N**= 100
1.	Labour	11 (22)	02 (02)	06 (12)	00 (00)	13 (26)	05 (05)	12 (24)	03 (03)	42 (21.00)	10 (10.00)
2.	Agriculture	16 (32)	09 (09)	15 (30)	08 (08)	17 (34)	07 (07)	18 (36)	06 (06)	66 (33.00)	30 (30.00)
3.	Animal Husbandry	14 (28)	11 (11)	17 (34)	12 (12)	15 (30)	10 (10)	11 (22)	14 (03)	57 (28.50)	47 (47.00)
4.	Business	02 (04)	00 (00)	01 (02)	01 (01)	00 (00)	00 (00)	01 (02)	00 (00)	04 (02.00)	01 (01.00)
5.	Service	07 (14)	03 (03)	11 (22)	04 (04)	05 (10)	03 (03)	08 (16)	02 (02)	31 (15.50)	12 (12.00)

(Figures in parenthesis indicates percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

Table-6 revealed that the agriculture provide main occupational livelihood for the majority (33.00%) of the livestock owners of the Tharu tribes followed by 28.50, 21.00, 15.50 and 02.00 per cents of the livestock owners were getting main occupation from animal husbandry, labour, services and business respectively.

The data in table-6 illustrates that majority of the traditional healers (47.00%) has animal husbandry as primary occupation followed by (30.00%) has agriculture, (12.00%) of the traditional healers belonged to service category, (10.00%) were labourers and only (01.00%) were involved in business occupation.

This trend is might be due to the availability of fertile land and farmers using it to grow sugar cane (a case crop) and getting handsome income. The 80% of sugar factories of the stets are also operating in this area.

Fig.-12 Distribution of Livestock owners according to their Occupation

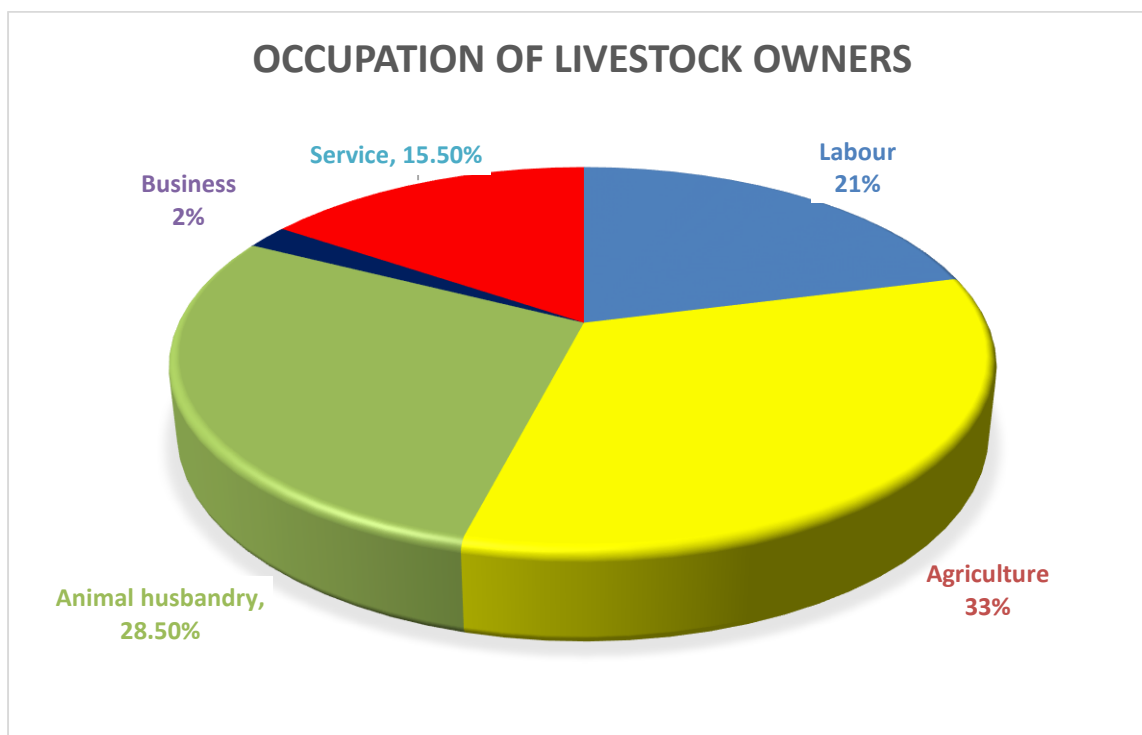
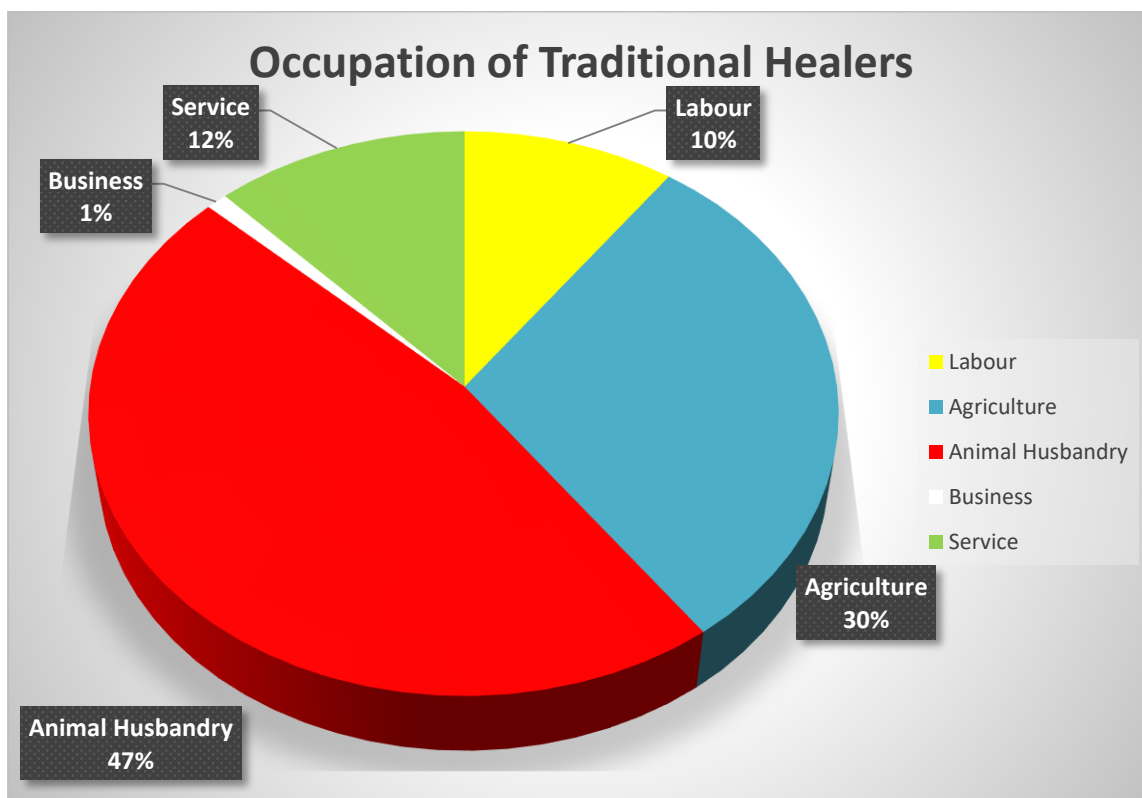


Fig.-13 Distribution of Traditional healers according to their Occupation



4.1.4 Family size

Family size refers to the total number of people living under a common rooftop and sharing kitchen together, from demographic perspective. It refers to the numbers of members in the Tharu tribes' family.

Table-7 Distribution of the respondents according to their Family size

Sl. No.	Family size (No. of members)	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N** =25	N*= 50	N** =25	N*= 50	N** =25	N*= 50	N** =25	N*= 200	N** =100
1.	Small (< 5)	16 (32)	02 (08)	13 (26)	05 (20)	11 (22)	01 (04)	15 (30)	03 (12)	55 (27.50)	11 (11.00)
2.	Medium(6-9)	23 (46)	15 (60)	25 (50)	17 (68)	28 (56)	19 (76)	26 (52)	16 (64)	102 (51.00)	67 (67.00)
3.	Large (> 9)	11 (22)	08 (32)	12 (24)	03 (12)	11 (22)	05 (20)	09 (18)	06 (24)	43 (21.50)	22 (22.00)

(Figures in parenthesis indicates percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

The table-7 revealed that majority of the livestock owners of Tharu tribes belonged to medium sized family (6 to 9 members) i.e. (46.00%) Bagaha-2 block, (50.00%) Ramnager block, (56.00%) Mainatanr block and (52.00%) Gawnaha block. Whereas (32.00%) in Bagaha-2 block, (26.00%) in Ramnager block, (22.00%) in Mainatanr block and (30.00%) in Gawnaha block were respectively from small sized (up to 5 members) family. Overall pooled value showed that majority of the livestock owners of Tharu tribes (51.00%) belonged to medium sized family having members (6 to 9) followed by (27.50%) belonged to small sized family and (21.50%) respondents were from large sized family.

Distribution of the traditional healers of Tharu tribes according to their family size has been presented. The Overall pooled data in table-7 shows that the majority of the traditional healers (67.00%) belonged to medium sized family (6- 9) followed by (22.00%) belonging to large family sized, and 11.00 per cent of the traditional healers were from small family sized of up to 5 members.

Fig.-14 Distribution of Livestock owners according to their Family size

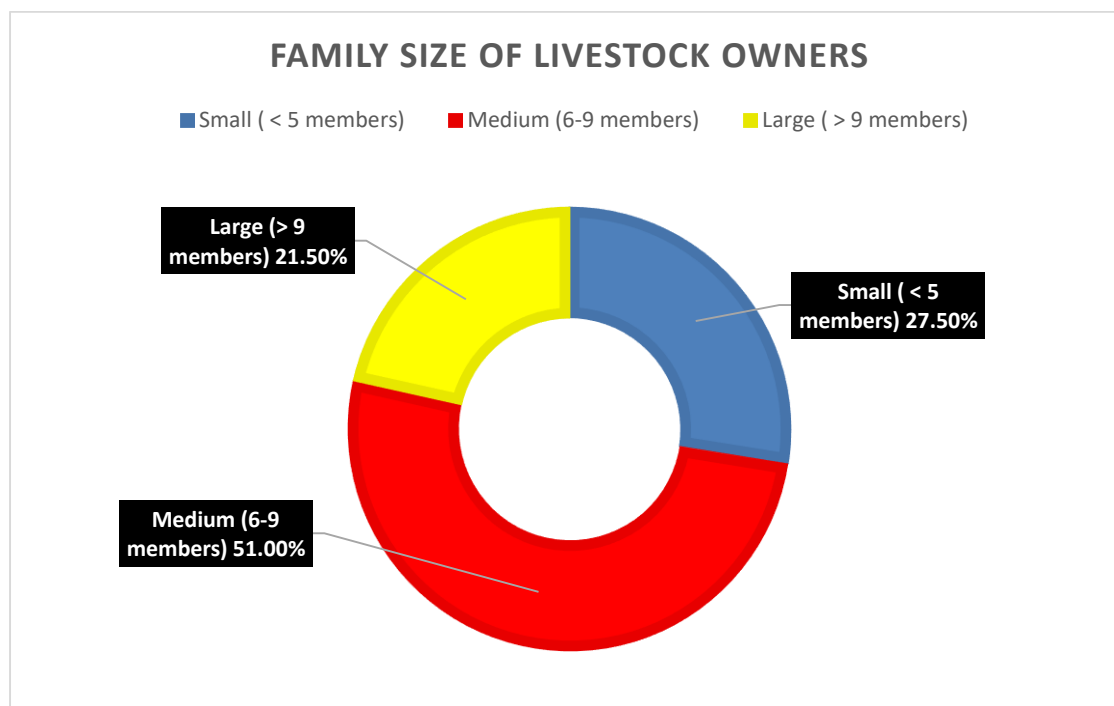
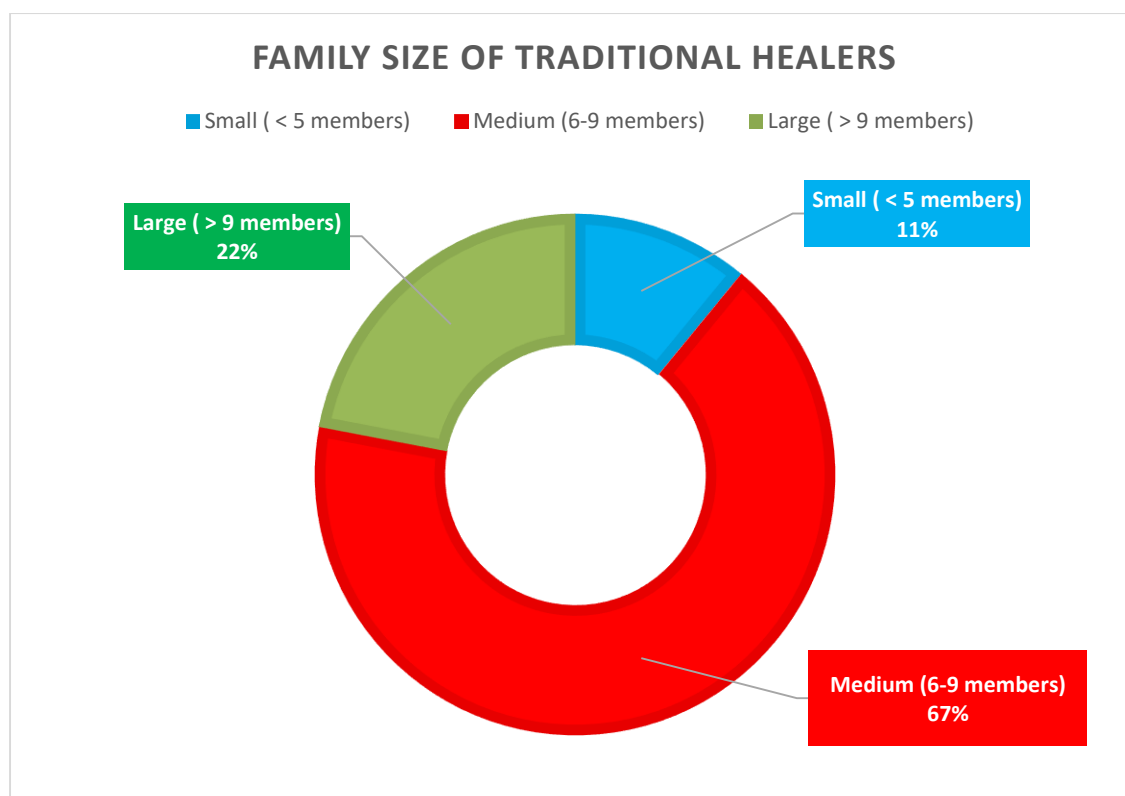


Fig.-15 Distribution of Traditional healers according to their Family size



4.1.5 Land holding

Land holding distribution shows the amount of land does the respondent possess. Land holding describes the background of the Tharu tribes whether they come from agricultural, labour, animal husbandry or services background.

Table-8 Distribution of respondents as per their Land holding

Sl. No.	Land holding (No. of Hectares)	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N** =25	N*= 50	N** =25	N*= 50	N** =25	N*= 50	N** =25	N*= 200	N** =100
1.	Marginal (< 1 ha)	23 (46)	06 (24)	26 (52)	05 (20)	21 (42)	04 (16)	27 (54)	05 (20)	97 (48.5)	20 (20)
2.	Small (1-2 ha)	15 (30)	15 (60)	13 (26)	17 (68)	16 (32)	18 (72)	12 (24)	16 (64)	56 (28)	66 (66)
3.	Medium (2-4 ha)	10 (20)	03 (12)	07 (14)	03 (12)	08 (16)	02 (08)	09 (18)	02 (08)	34 (17)	10 (10)
4.	Large (> 4 ha)	02 (04)	01 (04)	04 (08)	00 (00)	05 (10)	01 (04)	02 (04)	02 (08)	13 (06.5)	04 (04)

(Figures in parenthesis indicates percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

In present study table 8 depicts that majority of livestock owners of the Tharu tribes 48.50 per cent were marginal farmers (less than 1 hectares) followed by 28.00 per cent of small land holding (1 to 2 hectares) farmer, 17.00 per cent of medium land sized farmers (2 to 4 hectares) and only 06.50 per cent belonged to large land sized farmers (more than 4 hectares).

The information in table 8 depicts the distribution of traditional healers of the Tharu tribes as per their land holding in the Tharuhat area. The pooled data revealed that 66.00 per cent of the traditional healers belonged to small land holding size (1 to 2 hectares) followed by 20.00 per cent, 10.00 per cent and 04.00 per cent belonging to marginal land holding size (less than 1 hectares), medium land holding size (2 to 4 hectares) and large land holding size (more than 4 hectares) respectively.

The land man ratio is decreasing gradually, the finding is might be due to the fact that the land-man ratio is decreasing day by day in the area due to large growing population.

Fig.-16 Distribution of Livestock owners according to their Land holding

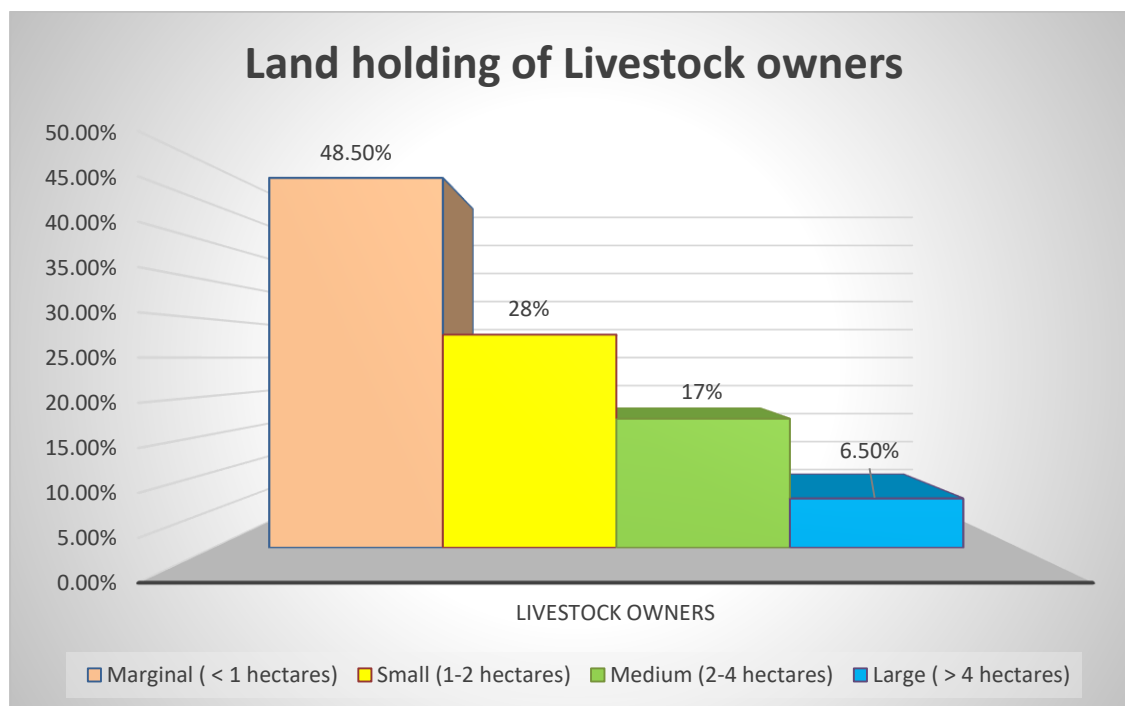
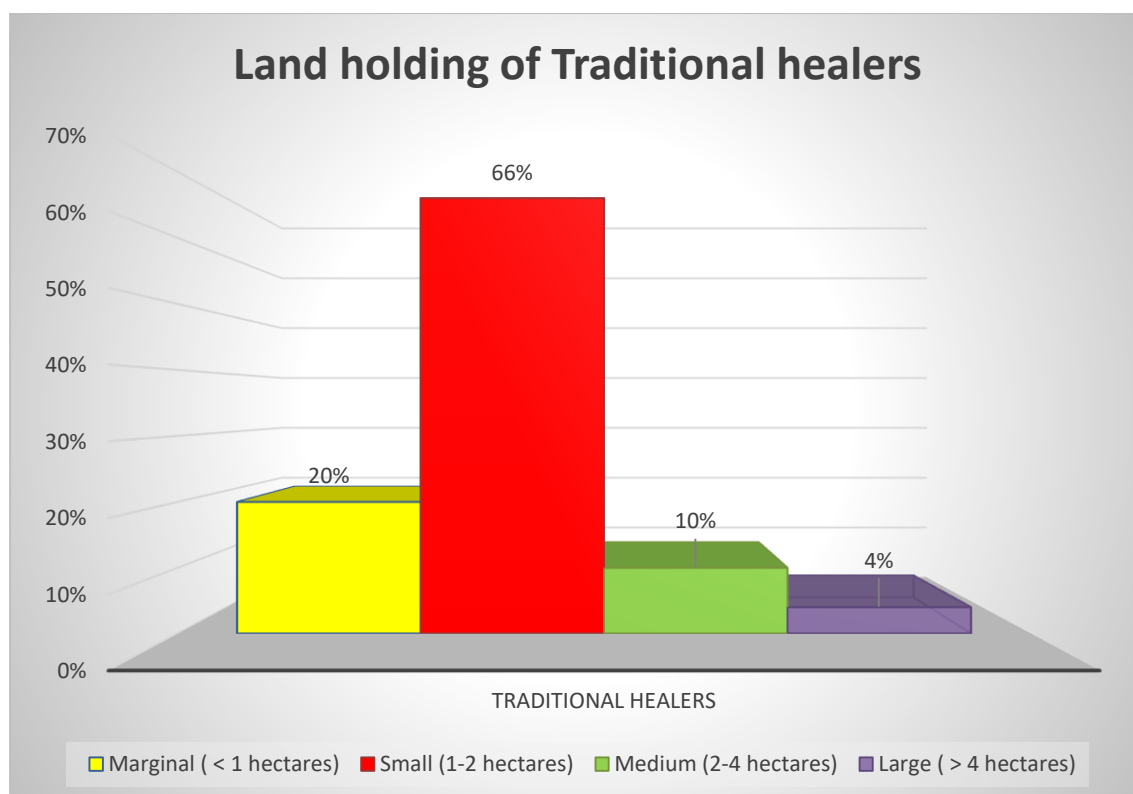


Fig.-17 Distribution of Traditional healers according to their Land holding



4.1.6 Herd size

Table-9 Distribution of respondents according to their Herd size

SI. No.	Herd size (No. of livestock)	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 200	N**= 100
1.	Small (< 10)	08 (16)	06 (24)	10 (20)	09 (36)	05 (10)	05 (20)	11 (22)	07 (28)	34 (17.00)	27 (27.00)
2.	Medium (10-20)	27 (54)	15 (60)	28 (56)	14 (56)	29 (58)	17 (68)	25 (50)	13 (64)	109 (54.50)	59 (59.00)
3.	Large (> 20)	15 (30)	04 (16)	12 (24)	02 (04)	16 (32)	03 (12)	14 (28)	05 (20)	57 (28.50)	14 (14.00)

(Figures in parenthesis indicate percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

Rearing of animals has always remained as an image for honour in the farming community. It is obviously articulated from table 9 that dominant part of livestock owners of the Tharu i.e. 54.50 per cent had herd size of medium (10 to 20 animals) whereas 28.50 per cent farmers had large herd size (more than 20 animals) whereas 17.00 per cent farmers belonged to small herd size category (less than 10 animals) livestock. The contribution of indigenous cows in herd was more as compared to buffalo and crossbred cows.

Pooled data from Table 9 revealed that 59.00 per cent of the traditional healers were having medium herd size (10 to 20 animals), 27.00 per cent had small herd size (less than 10 animals) and 14.00 per cent were having large herd size (more than 20 animals) of livestock.

This was found due to the decreasing per capita land and poverty in the area under study compelled the respondents to do the small activities line animal husbandry with low cost investments and with low inputs like labour and land etc.

Fig.-18 Distribution of Livestock owners according to their Herd size

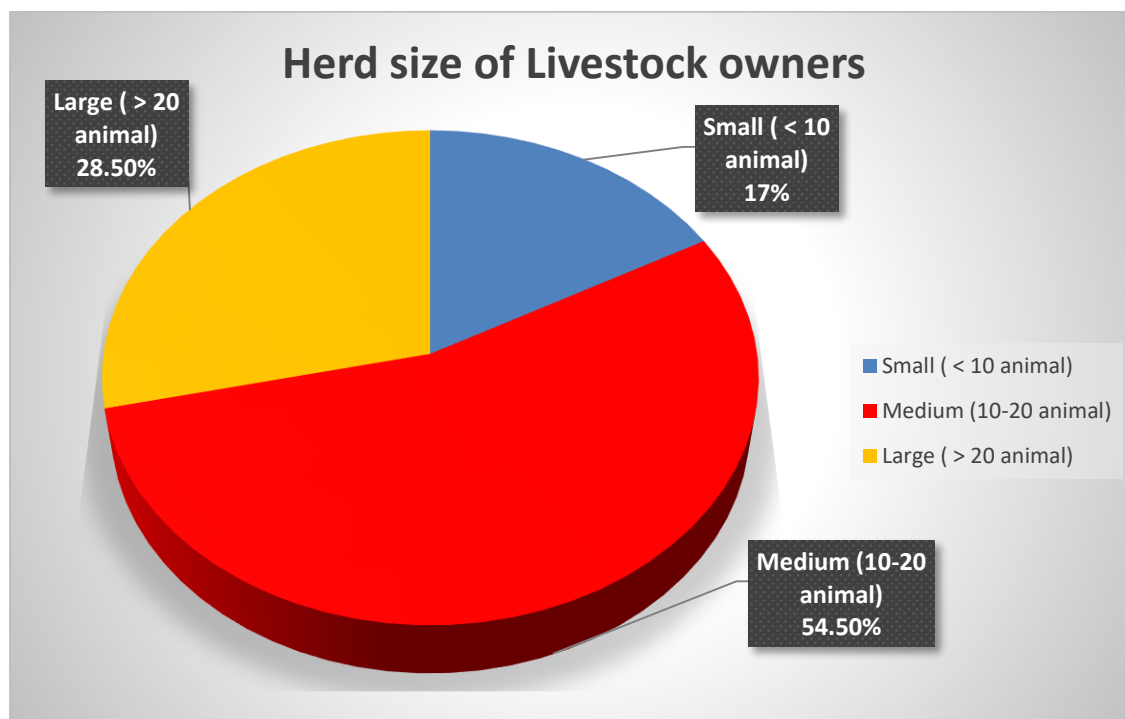
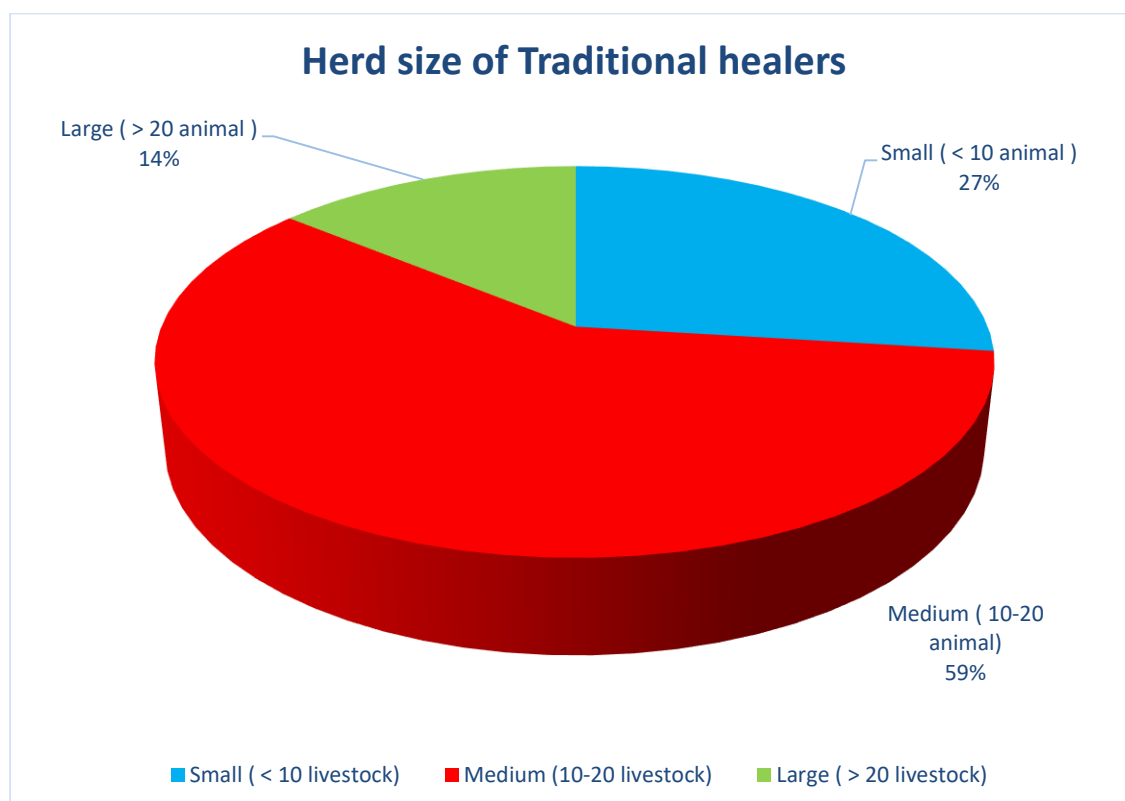


Fig.-19 Distribution of Traditional healers according to their Herd size



4.1.7 Annual income

Income of an individual assumes a significant part in forming the financial state of the households. Total annual income refers to the total income in terms of rupees derived from the various sources within a year.

Table-10 Distribution of the respondents according to their Annual income

Sl. No.	Annual income (Rs. in Thousand)	Bagaha-2		Ramnager		Mainatanr		Gawnaha		Total(N=300)	
		N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 50	N**= 25	N*= 200	N**= 100
1.	Low (< 21 Th.)	05 (10)	03 (12)	04 (08)	02 (08)	09 (18)	05 (20)	11 (22)	04 (16)	29 (14.50)	14 (14.00)
2.	Medium (21-40 Th.)	29 (58)	07 (28)	32 (64)	05 (20)	24 (48)	06 (24)	27 (54)	08 (32)	112 (56.00)	26 (26.00)
3.	High (> 40 Th.)	16 (32)	15 (60)	14 (28)	18 (72)	17 (34)	14 (56)	12 (24)	13 (52)	59 (29.50)	60 (60.00)

(Figures in parenthesis indicate percentage, N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

The pooled data in table 10 indicates that 56.00 per cent of the livestock owners of the Tharu tribes had medium level of annual income (21,000 to 40,000 rupees) followed by 29.50 per cent having high (more than 40,000) income level and 14.50 per cent having low (less than 21,000) level income.

Table 10 revealed that the majority 60.00 per cent of the traditional healers of the Tharu tribes had high (more than 40,000 rupees) level of annual income followed by 26.00 per cent had medium level income and only 14.00 per cent of the traditional healers had low (less than 21,000 rupees) level of annual income from the various sources.

Fig.-20 Distribution of Livestock owners according to their Annual income

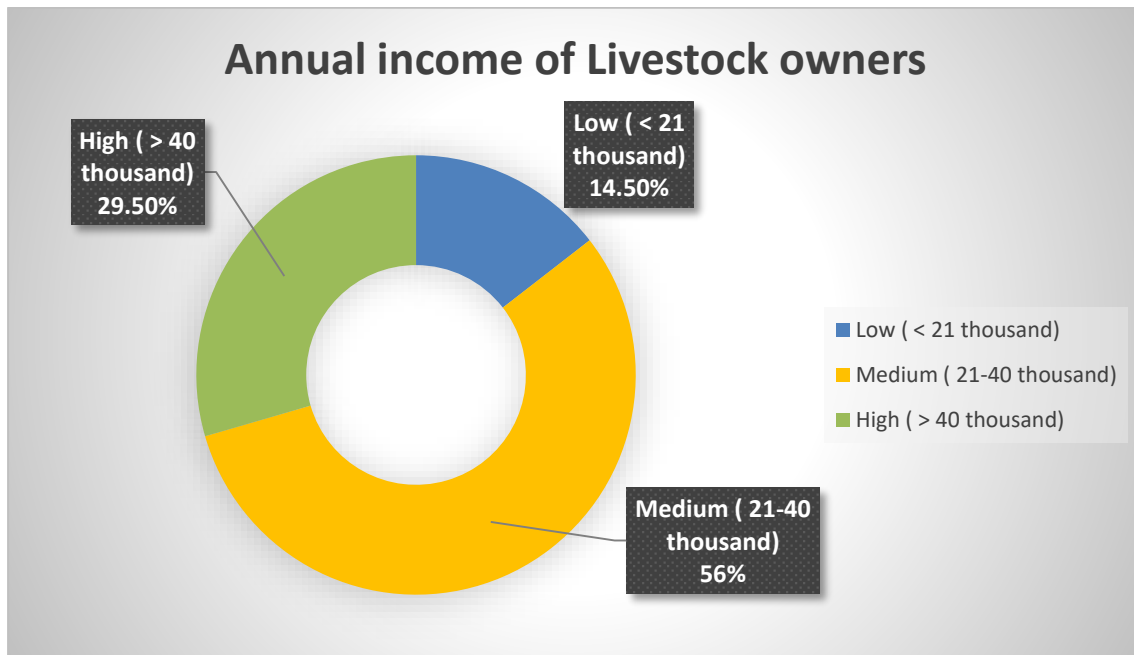
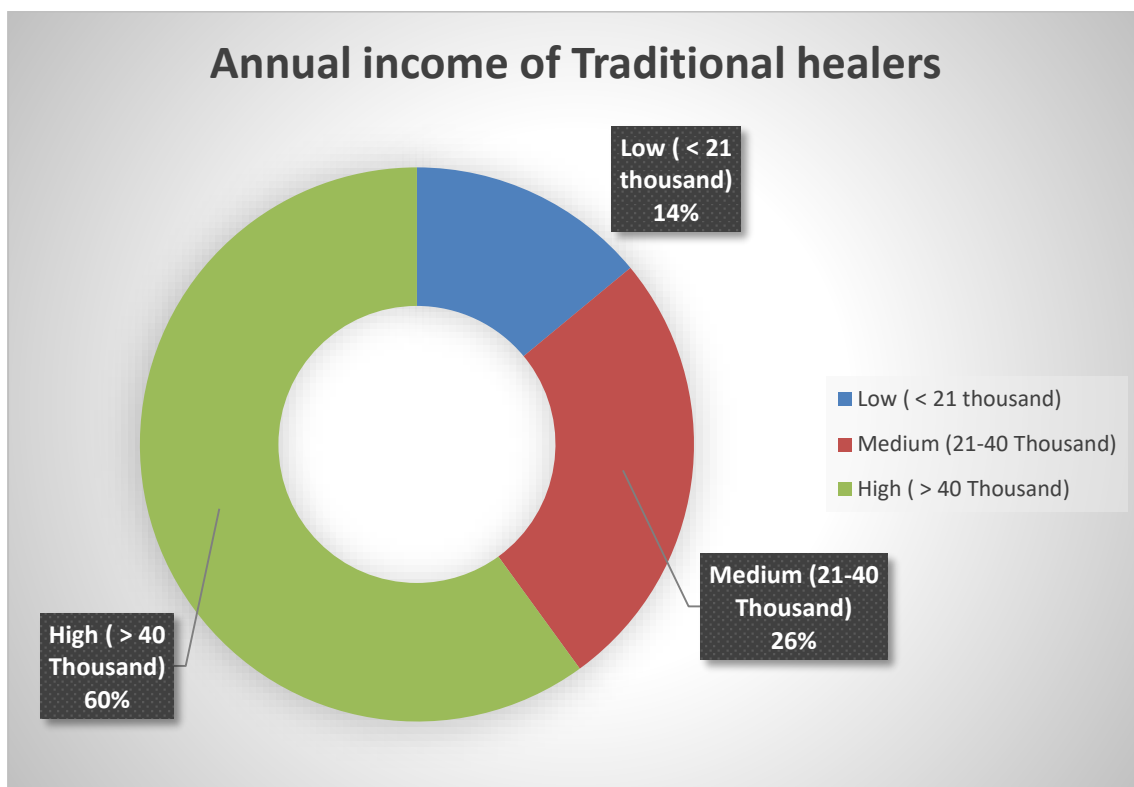


Fig.-21 Distribution of Traditional healers according to their Annual income



4.2 Communication characteristics

There are various sources and channels of communication of information from where the Tharu tribes receive information regarding indigenous animal husbandry practices. These sources and channels of communication of information were categorized into three categories, viz., extension agencies contact, information from mass media uses and information from informal sources. The data collected is presented in the following tables:-

4.2.1 Extension agency contact

There are number of sources and channels of information from where livestock owners and traditional healers gathers information from a number of extension agencies viz., animal husbandry officer/staffs, scientist, milk supervisors, jiwika worker etc.

Table-11 Distribution of the Livestock Owner and Traditional Healers according to their Extension Agency Contact

SI. No.	Extension Agency Contact	Degree of contact						Total score N=300		Rank	
		Mostly (2)		Sometimes (1)		Never (0)		N*= 200	N**= 100	N*= 200	N**= 100
		N*	N**	N*	N**	N*	N**				
1.	Animal Husbandry Officer/staffs	81	47	23	29	96	24	185	123	1 st	3 rd
2.	Scientist	56	63	35	25	109	12	147	151	2 nd	1 st
3.	Milk Supervisors	37	54	61	16	102	30	135	124	3 rd	2 nd
4.	Jiwika Workers	33	15	41	38	126	47	107	68	4 th	4 th

(Figures in parenthesis indicate N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

The information obtained from livestock owners in table 11 reveals that the animal husbandry officer/staffs are the most important source and channel of information regarding indigenous technical knowledge (ITK) in various animal husbandry practices followed by scientist, milk supervisors, and jiwika workers which were ranked as 2nd, 3rd and 4th respectively.

The pooled data obtained from traditional healer in table 11 also indicates that the scientist is the most important source of information regarding indigenous technical knowledge (ITK) for communication of various animal husbandry practices followed by milk supervisors, animal husbandry officer/staffs and jiwika workers which were ranked as 2nd, 3rd and 4th respectively.

4.2.2 Mass media exposure

A number of mass media used by Tharu people viz., radio, television, newspaper, magazine, poster, kisan mela and pradarshani were enlisted so that livestock owners and traditional healers of Tharu tribes can have easy access to select the choice which suits them.

Table-12 Distribution of the Livestock Owners and Traditional Healers according to their Mass Media Exposure

SI. No.	Mass media exposure	Degree of contact						Total score N=300		Rank	
		Mostly (2)		Sometimes (1)		Never (0)		N*= 200	N**= 100	N*= 200	N**= 100
		N*	N**	N*	N**	N*	N**				
1.	Radio	84	57	57	29	59	14	225	143	1 st	1 st
2.	Television	30	29	43	41	127	30	103	99	4 th	2 nd
3.	Newspaper	37	18	72	23	91	59	146	59	3 rd	3 rd
4.	Magazine	00	00	12	10	188	90	12	10	7 th	7 th
5.	Poster	10	15	17	18	173	67	37	48	6 th	6 th
6.	Kisan mela	58	13	42	23	100	65	158	49	2 nd	5 th
7.	Pradarshani	16	14	28	25	156	61	60	53	5 th	4 th

(Figures in parenthesis indicate N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

The pooled information in table 12 reveals that livestock owners of the area under study receives maximum information through radio regarding use of ITK for different animal husbandry practices and was ranked first among different mass media contact. However kisan mela, newspaper, television, pradarshani, poster, and magazine were as ranked 2nd, 3rd, 4th, 5th, 6th and 7th respectively by the livestock owners.

The results in table 12 further shows that the traditional healers obtained maximum information through radio regarding use of ITK for various animal husbandry practices and

was ranked first among different mass media. However television, newspaper, pradarshami, kishan mela, poster and magazine were heaving ranked 2nd, 3rd, 4th, 5th, 6th and 7th respectively by the traditional healers. This trend was probably due to their easy accessibility to radio in remote rural area and was cheapest source of getting information.

4.2.3 Informal information sources used

There are a various sources and channels of information of informal sources used viz., ancestors, neighbour, vaidyas, ojha and mukhiya which were enlisted so that livestock owners and traditional healers of the area may find it easy to tick as per their experience.

Table 13 Distribution of the Respondents (livestock owners and traditional healers) according to their Informal Information sources used

SI. No.	Informal information sources	Degree of contact						Total N=300		Rank	
		Mostly (2)		Sometimes (1)		Never (0)		N*= 200	N**= 100	N*= 200	N**= 100
		N*	N**	N*	N**	N*	N**				
1.	Ancestors	92	72	38	25	70	03	222	169	1 st	1 st
2.	Neighbour	76	48	43	36	81	16	195	132	2 nd	3 rd
3.	Vaidyas	35	59	51	34	114	07	121	152	5 th	2 nd
4.	Ojha	58	25	45	42	97	33	161	92	3 rd	5 th
5.	Mukhiya	49	37	26	48	125	15	124	122	4 th	4 th

(Figures in parenthesis indicate N*= no. of livestock owners, N**= no. of traditional healers and N= total no. of respondents)

The pooled data in table 13 indicate that the livestock owners acquired most of the information from their ancestors and have ranked them first among the informal source and channels of information of indigenous technical knowledge (ITK) for different animal husbandry practices. However other source and channels of information of ITK viz., neighbour, ojha, mukhiya and vaidyas were as ranked 2nd, 3rd, 4th, and 5th respectively.

The table 13 further reveals that the traditional healers obtained maximum information from ancestors having ranked first among the informal source and channels of information of ITK for several animal husbandry practices followed by vaidyas, neighbour, mukhiya and ojha were ranked as 2nd, 3rd, 4th and 5th respectively. This trend was might be due to the fact that

they are using these practise in their family and have belief as their family members are practicing it since long.

4.3 Documentation of indigenous technical knowledge (ITK) from Tharu

Tribes of Bihar.

Documentation of ITKs was done through focus Group Discussion with livestock owners and traditional healers of the Tharu tribes of the Tharuhat area (Fig: 3.3). Through Focus Group Discussion, it was revealed that the Tharu tribes of Tharuhat area were having deep knowledge regarding animal husbandry indigenous practices in various areas of breeding, feeding and health care practices and such practices were documented using semi-structured interview schedule and observation. The process of variations or modifications, if any, performed by resource persons were also indicated.

4.3.1 Breeding Practices

1. 250-300 gms mung (*Vigna radiata*) sprouts and 400-500 gms wheat (*Triticum aestivum*) sprouts fed to animal daily for 15 days to one month to induce heat and increase conception rate.
2. Bamboo leaves (*Bambusa arundinacea*) about 4-5 kg were fed to animal for expulsion of placenta after parturition.
3. 1 kg methi (*Trigonella foenum-graecum*) grains were boiled and fed empty stomach to animals for one week to induce heat.
4. 100-200 gms of satawar (*Asparagus racemosus*) root powder, 1 kg of gurr (Jaggery), 100-200 gms of ajwain (*Trachyspermum ammi*), are mixed and boiled in 5.0 liters, of water. The extract liquid is cooled and provided to the animal for the treatment of retention of placenta (50-100 ml BID for 4-5 days).
5. 100-150 gms each of turmeric or haldi (*Curcuma longa*) powder and 100 gms mustard oil are mixed and fed to the animal in case of retention of placenta.
6. The animals were provided Paddy seed or dhan (*Oryza sativa*) which helps in expulsion of placenta.
7. Unripe papaya 4-5 kg per adult animal is fed by cutting it into small pieces followed by feeding 100-150 gms mixture prepared from bael (*Aegle marmelos*), satawar (*Asparagus racemosus*) and methi (*Trigonella foenum-graecum*) for treatment of retention of placenta (ROP).

Fig.-22 Image of Methi (*Trigonella foenum-graecum*)



Fig.-23 Image of Satawar plant (*Asparagus racemosus*)



Fig.-24 Image of Bamboo plant (*Bambusa arundinacea*)



Fig.-25 Image of Bael (*Aegle marmelos*)



4.3.2 Feeding Practices

1. 1 kg Berseem (*Trifolium alexandrinum*), 1/2 kg makka or maize (*Zea mays*), 1/2 kg bajra (*Pennisetum glaucum*) and 50 ml til oil (*Sesamum indicum*) was fed to animal once a day. It was increased the milk yielding potential of animals.
2. The dairy animals were provided 200 gms satawar (*Asparagus racemosus*) root 7-10 days in a month to increases the milk yielding of animal. It also helps to improve the uterine health.
3. Bair or Badar leaves (*Ziziphus mauritiana*) 400-500 gms were boiled and extract liquid is cooled and provided to the animal once in a day for 10-15 days in a month to increase milk production.
4. Leaves of khajur or Date palm (*Phoenix dactylofora*) was fed to animals. It increases the fat content of milk and milk production also.
5. Animals are fed equal proportions of mixture of masoor (*Lens culinaris*) dal, mung (*Vigna radiate*) dal, satawar (*Asparagus racemosus*) and sweet saunf (*Foeniculum vulgare*) @50 gms mixed with 250 gms of gurr (Jaggery) in empty stomach to increase milk production and general body health.
6. 12-15 ripe kela or banana (*Musa acuminata*) was used as galactagouge and improve the udder issues.

Fig.-26 Image of Bair or Badar leaves (*Ziziphus mauritiana*)



Fig.-27 Image of khajur or Date palm (*Phoenix dactylofora*)



4.3.3 Health Care Practices

a) Indigestion

1. 50-60gm of jeera or, cumin (*Cuminum cyminum*) seed powder and 10 gm of black salt were mixed with 1 litres of water and given orally for 4-5 days in case of mild indigestion occurred during monsoon season.
2. Leaves of amaltas or haedma (*Cassia occidentalis*) were grind boiled and the decoction was given to the animal to cure the indigestion problem.
3. Fleshy leaves of gheekumari or Aloe vera (*Aloe barbadensis miller*) was fed to animal to cure anorexia and indigestion.
4. Tisi or flax (*Linum usitatissimum*) seed oil was given to the animal in case of indigestion.
5. Pudina (*Mentha viridis*), leaves of peepul tree (*Ficus religiosa*), Ajwain (*Trachyspermum ammi*), salt, bitter gourd or karela (*Momordica charantia*) each of 50 gms are grinded and use to cure tympany and indigestion problem.

b) Constipation

1. Leaves of kadam (*Neolamarckia cadamba*) along with molasses was fed to animals in case of constipation.
2. Leaves of kadam (*Neolamarckia cadamba*) and bark of Mango (*Mangifera indica*) tree.
3. 25-50 gms each of Ajwain (*Trachyspermum ammi*), Hing (*Asafoetida*), til cake, amaltas (*Cassia fistula*) seeds and Black salt are grinded, powdered and fed @ 50-100 gms BID for 2 days to the animals in case of constipation.
4. Desi ghee 50-100 gms mixed with concentrates was fed orally to the animals suffering from constipation.
5. 250-300 gms of Isabgol (Psyllium) husk mixed in 1-2 liters of lukewarm water or milk and fed to the animals in the treatment of constipation.
6. 100 g of saumf (*Foeniculum vulgare*) was mixed in wheat flour and fed to animal once a day.

c) Diarrhoea or Dysentery

1. Gumma leaves (*Leucas aspera*) 200-250 gms is used to control the diarrhoea and other related issues in animals.
2. Unripe fruits bael (*Aegle marmelos*) mixed with fresh leaf of shisham (*Dalbergia sissoo*) was fed orally to the animals to cure the bloody diarrhoea or, dysentery in animals.
3. Fresh fruit of Amla (*Emblica officinalis*) fed orally in empty stomach to the animals to control diarrhoea.
4. 150-200 gms doodle or asthma plant (*Euphorbia hirta*) commonly called as 'Doodh ki jadi' was fed to animal once a day to cure diarrhoea or, dysentery.
5. A mixture of unripe mango (*Mangifera indica*), barks of semal or cotton tree (*Bombax ceiba*) and jamun (*Syzygium cumini*) was fed orally to the animals for controlling diarrhoea.
6. Datura fruits (*Datura stramonium*) 100 gms burned in fire and ash is fed orally to the animal with normal diet to cure diarrhoea or, dysentery.
7. Unripe fruits of bael (*Aegle marmelos*) were fed orally to the animals having diarrhoea and tympany.
8. A mixture of fresh raktakamal or red and blue water lily leaves leaves (*Nymphaea nouchali*) and soda was fed orally to the animal in case of dysentery.

9. Paste prepared from Banana (*Musa acuminata*) flower and turmeric (*Curcuma longa*) 250 gms were fed orally to the animal to control diarrhoea.

d) Bloat or Tympany

1. 1-2 liters of whey or mattha, 50-100 gms of black salt, 100-200 gm of kachri or, ban-kundri (*Cucumis callosus*), 500-1000 ml of water and 50-60 ml of mustard (*Brassica nigra*) oil is fed orally to control tympany and bloat.
2. 25-50 gms of each hing (*Asafoetida*) and ajwain (*Trachyspermum ammi*) mixed and fed orally 50-60 gms twice daily to the animal in case of bloat as well as abdominal pain and discomfort.
3. 250 gms of Gheekumari or Aloe vera (*Aloe barbadensis miller*) was given to animal. Outer layer of Aloe vera was peeled off and remaining portion was roasted in fire. To it, 200 gms Ajwain (*Trachyspermum ammi*), 200 gms of kalajeera (*Cuminum cyminum*) and kala namak (Black salt) were and it's mixture was fed to animal once a day in case of bloat.
4. 1kg roasted maize (*Zea mays*) was crushed and mixed in water and mixture was given to the animal once a day.
5. Leaves of 'Tulsi' (*Ocimum sanctum*) 100 gms were given orally to the cattle to relieve tympany or, bloat.
6. A mixture is prepared from burnt Tobacco (*Nicotiana tabacum*), burnt maize (*Zea mays*) and cockroach faeces and applied on the belly.
7. Equal amount of dry ginger (*Zingiber officinale*) and golmirch (*Piper nigrum*) mixed in luke warm water.
8. 1 litre of mustard oil (*Brassica compertris*) was mixed with soda (*Sodium bicarbonate*) and water and drenched it to the animal.

e) Ulcer

1. Leaves of Banana tree (*Musa paradisiaca*) were ground and its juice was given orally to the animal twice daily for treatment of ulcer.
2. Butter 100 gms with chapatti or, roti was given orally to the animal once daily.

f) Fever

1. Powdered mixture of leaves or stem of green chiretta or, kalmegh (*Andrographis paniculata*) and neem (*Azadirachta indica*) seeds each of 50 gms was fed orally to the animal in case of fever.
2. Mixture prepared from aadi or, ginger (*Zinger officinate*), kali mirch or, golmirch (*Piper nigrum*) and roots of kokshima (*Verbascum coromanddianum*) each of 50-100 gms.
3. Powdered of roots of Ayapana (*Expatorium triplinerve*) and Black jera. (*Cuminum cyminum*) each of 100 gms was fed orally to the animal in case of fever.
4. Turmeric or, haldi (*Curcuma longa*) – 50-60 gms, ajwain (*Trachyspermum ammi*) - 100 gms and rock salt – 200 g are mixed and applied on tongue of the animal. It cures general fever.
5. 150-200 gms kali mirch or, golmirch (*Piper nigrum*), 150-200 gms badi elaichi (*Cardamom*) and 150-200 gms ajwain (*Trachyspermum ammi*) were ground and mixed with water and was fed to animal twice daily.
6. Roots of apang or, chrchri (*Achyramthes aspera*) is grounded and mixed with water.

g) Fracture or Sprain

1. A paste prepared from harjora plant (*Cissampelos quadrangularicus*) is applied and external support is provided by bamboo sticks.
2. Paste of harjora stem (*Cissampelos quadrangularicus*) and til oil (*Sesamum indicum*) is applied on the affected part and external support is provided by bamboo stick (*Bambusa auriculata*) in case of fracture.
3. Paste prepared from bark of moringa or, sahajan tree (*Moringa oleifera*), lime and turmeric or, haldi (*Curcuma longa*) and it is heated and applied with external fixation to the animal.
4. A paste prepared from equal part of mehdi (*Lawsonia inermis*) leaves, turmeric or, haldi (*Curcuma longa*), harjora (*Cissampelos quadrangularicus*) leaves and cactus (*Cactaceae juss*) stems is applied and support is provided by bamboo stick (*Bambusa auriculata*) externally.
5. Paste prepared from 200 gms of methi (*Trigonella foenum-graecum*) seeds in 200 ml of til (*Sesamum indicum*) oil is applied.

6. Powdered root or paste of the stem of the harjora (*Cissampelos quadrangularicus*) and Doob grass (*Cynodon dactylon*) was frequently use in fracture case.
7. Application of til oil (*Sesamum indicum*) on the affected part after fixing it with bamboo splints (*Bambusa auriculata*) externally.

h) Wound or External injuries

1. Powdered methi seeds (*Trigonella foenum-graceum*) were mixed with til oil (*Sesamum indicum*) and applied topically on the affected part.
2. Application of turmeric or, haldi (*Curcuma longa*) and coconut oil (*Cocos nucifera*).
3. Powdered Sanai seed (*Crotalaria juncea*) was mixed with coconut oil (*Cocos nucifera*) and applied topically on the lacerated wound.
4. Application of turmeric or, haldi (*Curcuma longa*) and Deshi Ghee as a past topically on the affected area.
5. Paste made from root and bark of Jamun (*Syzgium jambolanum*) is applied topically on the affected part.
6. Application of paste prepared from kapur or, camphor (*Cinnamomum camphora*) coconut oil (*Cocos nucifera*) and turmeric or, haldi (*Curcuma longa*) on the affected region.
7. Extract of Genda or, marigold (*Tagetes erecta*) leaves is applied topically.
8. Extract of bhringraj (*Eclipta prostrata*) leaves and stem is applied topically on the affected part.

i) Foot and Mouth Disease (FMD)

1. 500-600 gms of giloy or, amarlata (*Tinospora cordifolia*) was ground and given twice a day.
2. 1 kg Amla (*Phyllanthus emblica*) and piece of iron were boiled in water. When this suspension was cooled down, it was applied on the feet of affected animal.
3. The affected part is cleaned with boiled neem leaves (*Azadirachta indica*) water. Then neem (*Azadirachta indica*) oil is applied.
4. Extract of bark of Babul (*Acacia arabica*) boiled in water. When this suspension was cooled down, it was applied topically on the feet of affected animal.

5. Washing the hooves or, affected area of the animal with lime water or, Karanj oil (*Pongamia pinnata*) and cream of milk or, milk butter was applied topically on the affected parts for treatment of FMD.
6. Leaves and fruit of kela or, banana (*Musa paradisiaca*) in equal quantity were ground and mixture was fed to the animal suffering from foot and mouth disease.
7. Tulsi leaves (*Ocimum sanctum*) is grounded and applied topically on the affected parts.
8. Pulp of bel (*Aegle marmelos*) and sitaphal or, sugar-apple (*Annona squamosa*) in equal amount is grounded, pasted and applied on the affected parts to the animal.

j) Ectoparasites

1. 50-60 gms common salt (*Sodium chloride*) was added to 250-300 ml of mustard oil or, sarso tel (*Brassica compestris*) and this solution was applied all over the body of animal for treatment of ectoparasites.
2. 10-20 ml of kerosene oil or petrol was applied all over the body of the animal to removal of ectoparasites.
3. The decoction or, elixation of neem (*Azadirachta indica*) leaves and fruits were applied all over the body of animal to remove external parasites.
4. Dung with grounded leaves of saripha or, sugar apple (*Annana squamosal*) was applied all over the body of animal.
5. Tamaku or, tobacco (*Nicotiana tabacum*) shoot mixed with kerosine oil were applied all over the body of animal for treatment of ectoparasites.

k) Endoparasites

1. Leaves of neem (*Azadirachta indica*) were ground and fed to the animal to remove internal parasites.
2. Bark and leaves of anar or, bedana or, pomegranate (*Punica granatum*) are boiled with water. When this boiled water was cooled down, it was fed to the animal for removal of endoparasites.
3. Bark of ashoka tree (*Saraca asoca*) are boiled with water and cooled down, then it was fed to the animal.
4. Paste prepared from papaya (*Carica papaya*) and neem seed (*Azadirachta indica*) in equal amount and fed to the animal.

5. Mixture prepared from dry ginger (*Zingiber officinale*), leaves of neem (*Azadirachta indica*), papaya seeds (*Carica papaya*), palas seeds (*Butea monosperma*), methi (*Trigonella foenum-graceum*) and black pepper (*Piper nigrum*) and fed to the animal.
6. 50-60 gms paste prepared from fresh leaves of sesame or, til (*Sesamum indicum*) mixed with 10-15 gms of rock salt and 250 gms of butter milk or, cream of milk are fed for removal of internal parasites to the animals.

l) Mastitis

1. 10-20 gms turmeric or, haldi (*Curcuma longa*), 10-20 gms alum or phitkari (Potassium aluminium sulfate) and 10-20 gms kali mirch (*Piper nigrum*) were ground and massaged on teats once a day.
2. 15-20 gms black salt was applied on the affected teats once a day topically.
3. Juice extracted from 500-600 gms of mulberry or, tutt (*Morus alba*) leaves mixed with jaggery or, gur and cow ghee are applied over the affected area of udder in treatment of mastitis.
4. 250-500 gms dhania or, coriander (*Coriandrum sativum*) leaves or, 200-300 gms dhania or, coriander (*Coriandrum sativum*) seed were fed to cure mastitis.

m) Snake bite

1. Leaves, seeds, stem bark and root bark of siris tree (*Albizia lebbeck*) were grounded and fed to the animal for treatment of snake bite.
2. 250-300 ml extract of giloy or, amrlati (*Tinospora cordifolia*) is fed to the affected animal.

Fig.-28 Image of Amaltas or Haedma Leaves (*Cassia occidentalis*)



Fig.-29 Image of Gheekumari or Aloe vera (*Aloe barbadensis miller*)



Fig.-30 Image of Pudina (*Mentha viridis*)



Fig.-31 Image of Kadam (*Neolamarckia cadamba*)



Fig.-32 Image of Doodhi (*Euphorbia hirta*)



Fig.-33 Image of Semal (*Bombax ceiba*)



Fig.-34 Image of Datura fruits (*Datura stramonium*)



Fig.-35 Image of Raktakamal or red and blue water Lily leaves (*Nymphaea nouchali*)



Fig.-36 Image of Ayapana (*Eupatorium triplinerve*)



Fig.-37 Image of Green Chiretta or, Kalmegh (*Andrographis paniculata*)



Fig.-38 Image of Apang or, Chrchri (*Achyramthes aspera*)



Fig.-39 Image of Harjora plant (*Cissampelos quadrangularis*)



Fig.-40 Image of Moringa or, Sahjan tree (*Moringa oleifera*)

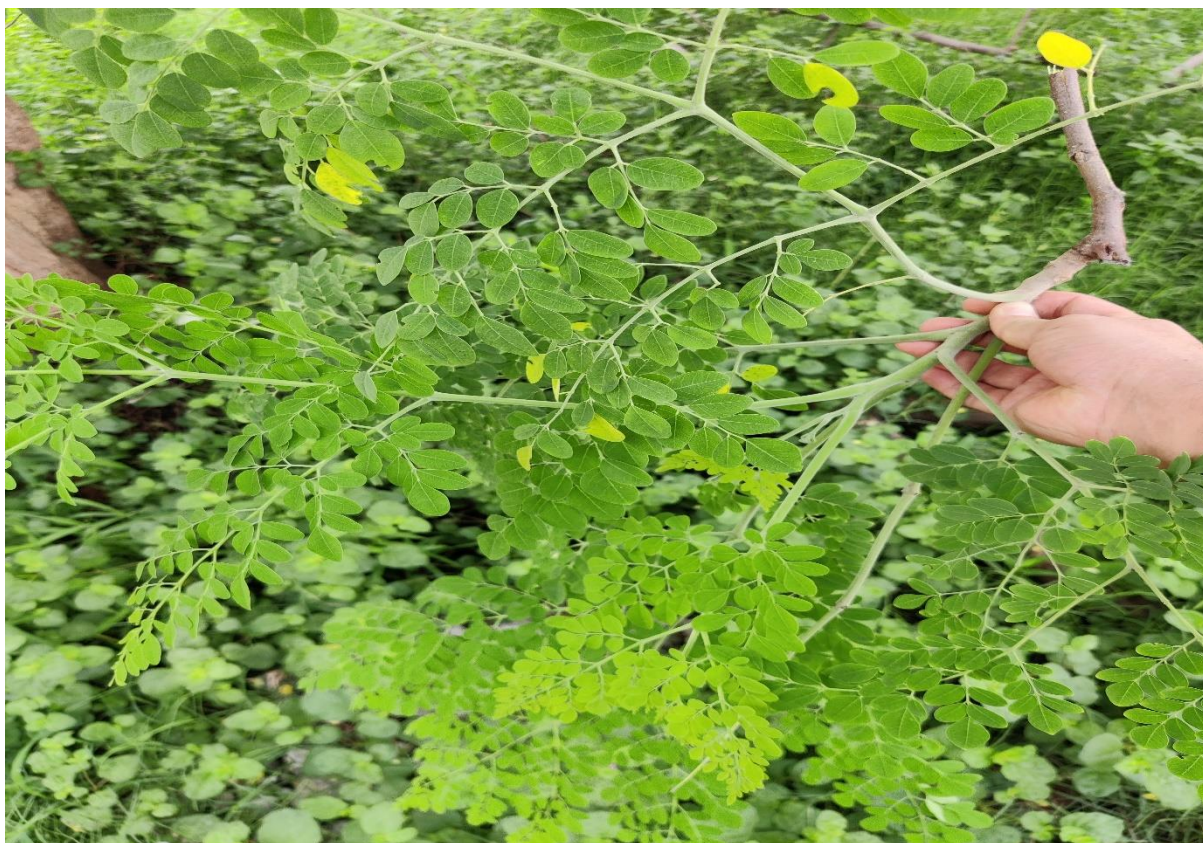


Fig.-41 Image of Mulberry or, tutt (*Morus alba*)



4.4 Extent of Awareness and Adoption of indigenous technical knowledge (ITK) among Tharu Tribes (livestock owners) of Bihar

This segment presents the degree of awareness and adoption of indigenous technical knowledge (ITK) for various animal husbandry practices among selected livestock owners and traditional healers of selected Tharuhat region i.e., (Bagaha-2, Ramnager, Mainatanr and Gawnaha blocks) of Bihar. The degree of awareness and adoption was studied for the most commonly utilized five documented ITK's by the livestock owners and traditional healers in their animals for various animal husbandry practices.

4.4.1 Extent of awareness of most commonly used indigenous technical knowledge (ITK) in Tharuhat area

Table-14 Frequency distribution of the extent of awareness of most commonly used ITK practices among livestock owners in Tharuhat area

S.N.	Category	Level of awareness				
		Bagaha-2	Ramnager	Mainatanr	Gawnaha	Pooled value
1	Low (0-25%)	15 (30.00)	23 (46.00)	13 (26.00)	08 (16.00)	59 (29.50)
2	Medium (26-50%)	22 (44.00)	20 (40.00)	28 (56.00)	21 (42.00)	91 (45.50)
3	High (51-75%)	09 (18.00)	07 (14.00)	04 (08.00)	11 (22.00)	31 (15.50)
4	Very high (76-100%)	04 (08.00)	00 (00.00)	05 (10.00)	10 (20.00)	19 (09.50)

(Figures in parenthesis indicate percentage)

Distribution of respondent (i.e. livestock owners) as per the level of awareness towards most commonly used ITK practices.

The table revealed that the maximum respondents (i.e. 46.00 per cent) of Ramnager block had low level of awareness. Whereas in the blocks Bagaha-2, Mainatanr, and Gawnaha, majority of the respondent i.e., 44.00 per cent, 56.00 per cent and 42.00 per cent respectively

showed medium level of awareness. It is very much distinguished that none of the respondent of the block Ramnager had very high level of awareness of most commonly used ITK practices.

The pooled value indicated that 45.50 per cent of the respondents were in the medium category and only 09.50 per cent of respondents had very high level of awareness of most common used ITK practices. This trend was might be due to their low education level and due to rearing of low cost animals with lesser concuss towards their health issues.

4.4.2 Extent of adoption of most commonly used indigenous technical knowledge (ITK) in Tharuhat area

Table-15 Distribution of the extent of adoption of most commonly used indigenous technical knowledge (ITK) practices among livestock owners in Tharuhat area

S.N.	Category	Level of adoption				
		Bagaha-2	Ramnager	Mainatanr	Gawnaha	Pooled value
1	Low (0-25%)	14 (28.00)	22 (44.00)	15 (30.00)	10 (20.00)	61 (30.50)
2	Medium (26-50%)	24 (48.00)	20 (40.00)	27 (54.00)	21 (42.00)	92 (46.00)
3	High (51-75%)	10 (20.00)	08 (16.00)	03 (06.00)	08 (16.00)	29 (14.50)
4	Very high (76-100%)	02 (04.00)	00 (00.00)	05 (10.00)	11 (22.00)	18 (09.00)

(Figures in parenthesis indicate percentage)

The adoption level was explored among the respondent (i.e. livestock owners) of all the four blocks. The table clearly showed that 44.00 per cent respondent of Ramnager were in the category of low adopters. Whereas in block Bagaha-2, Mainatanr and Gawnaha majority of the respondents (i.e. 48.00 per cent, 54.00 per cent and 42.00 per cent respectively) were

found to be in medium adopter category. However, none of the respondents in Ramnager were found in the group of very high level of adoption.

The pooled data revealed that majority of the respondents (i.e. 46.00 per cent) showed medium adoption level towards most common used ITK practices of animal husbandry whereas only 09.00 per cent of the respondents were having very high level of adoption regarding most common used ITK practices. This trend was might be due to their low educational level and concuss towards animals health conciseness in remote rural areas.

Fig-42 Distribution of Livestock owners according to their Awareness of most commonly used indigenous technical knowledge (ITK) practices

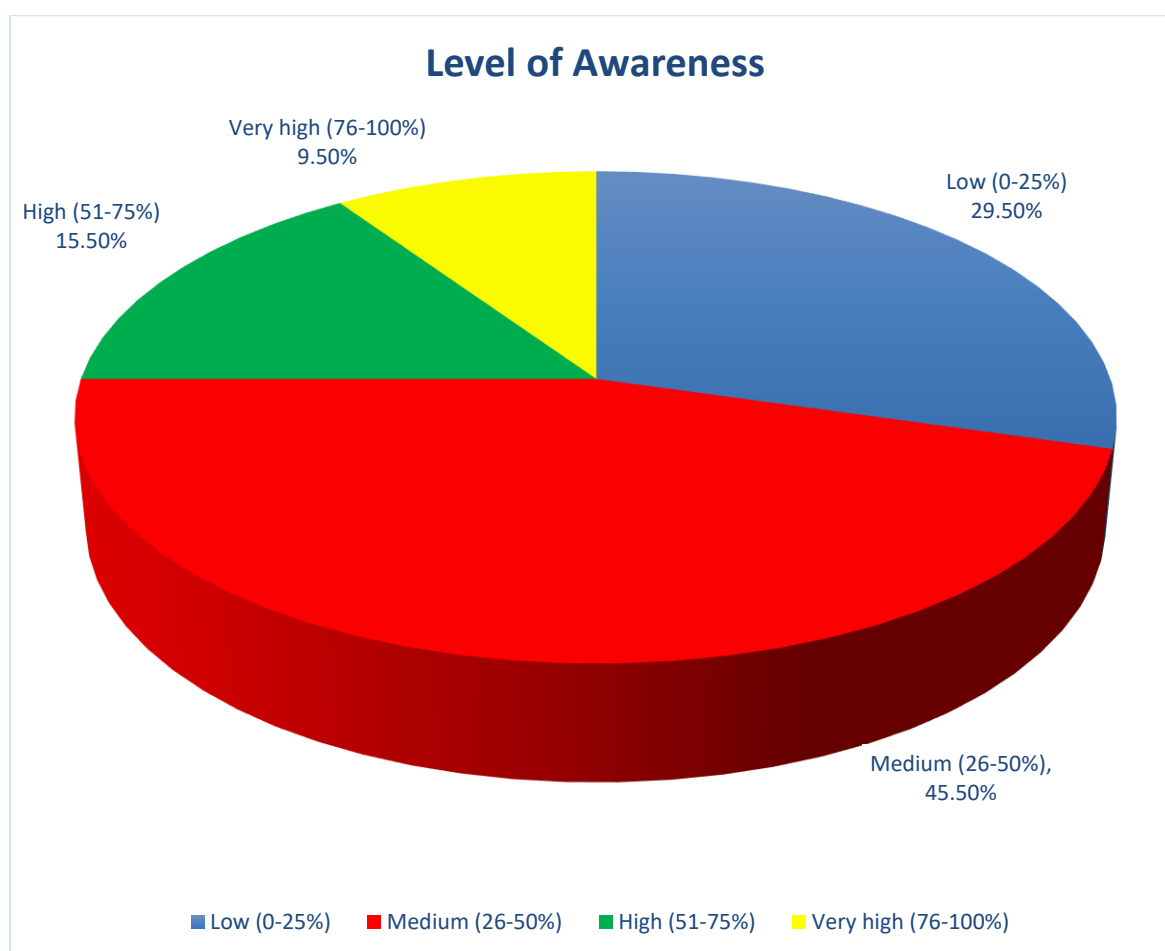
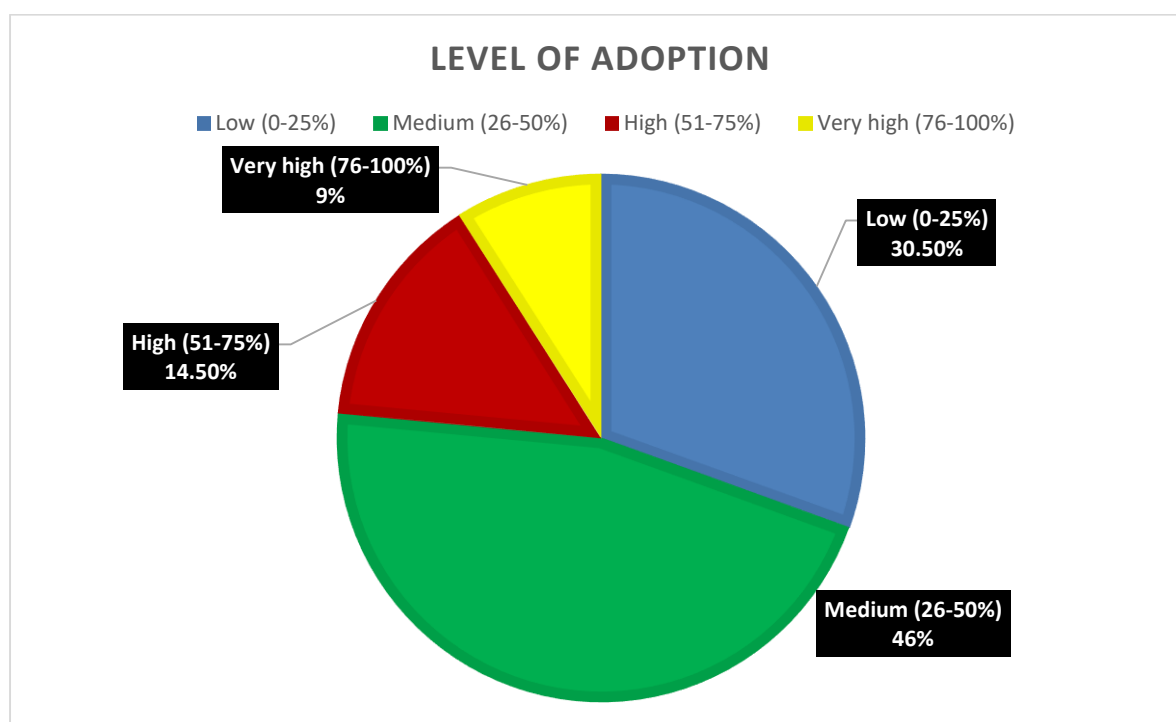


Fig-43 Distribution of Livestock owners according to their Adoption of most commonly used indigenous technical knowledge (ITK) practices



4.5 Perceived effectiveness of indigenous technical knowledge (ITK) among Tharu Tribes of Bihar in terms of cost, simplicity/complexity, availability/accessibility, adaptability, Rationality and sustainability.

This section presents the perceived effectiveness of indigenous technical knowledge (ITK) among randomly selected livestock owners for a number of animal husbandry practices. The perceived effectiveness of ITK's was studied in terms of cost, simplicity/complexity, availability/accessibility, adaptability, rationality and sustainability for the most commonly used five ITK's used by resource persons as well as by livestock owners in their animal for different animal husbandry practices. The perceived effectiveness of ITK's for various animal husbandry practices was discussed in detail as here under:

Table-16 Perceived effectiveness of Satawar (*Asparagus racemosus*) root towards increasing the milk production and cleaning of uterus after parturition in Thruhat area

S.N.	Variables	Not	Somewhat	Most
1.	Cost effective	35 (17.50%)	56 (28.00%)	109 (54.50%)
2.	Simplicity	28 (14.00%)	50 (25.00%)	122 (61.00%)
3.	Availability/Accessibility	38 (19.00%)	46 (23.00%)	116 (58.00%)
4.	Adaptability	44 (22.00%)	97 (48.50%)	59 (29.50%)
5.	Rationality	34 (17.00%)	104(52.00%)	62 (31.00%)
6.	Sustainability	26 (13.00%)	61 (30.50%)	113 (56.50%)

(Figures in parenthesis indicate percent value)

Perception of respondents towards effectiveness of satawar (*Asparagus racemosus*) with respect of selected variables e.g. cost, simplicity, availability/accessibility, adaptability, rationality and sustainability was recorded and it was found that 61.00 per cent of the respondent were perceived it as it is easy to use followed by its availability 58.00 per cent have it is easily available in the village and forest area. About 54.50 per cent of the respondents prefer it as it is cheaper in terms of cost.

Table-17 Distribution of respondent for perceived effectiveness of Satawar (*Asparagus racemosus*) root towards increasing the milk production and cleaning of uterus after parturition

S.N.	Categories (score)	Frequency	Percentage
1.	Low (0-4)	26	13.00
2.	Medium (5-8)	91	45.50
3.	High (9-12)	83	41.50

Table 17 depicts the distribution of respondents towards perceived effectiveness of satawar and was found that the majority of the respondents i.e., about 45.50 per cent belonged to medium category followed by high (41.50 %) and low (13 %).

It was might be due to its low cost and availability in the nearby area, which motivate them to use it.

Table-18 Perceived effectiveness of Harjora plant (*Cissampelos quadrangularicus*) towards bone fracture or, sprain and swelling in animal among livestock owners

S.N.	Variables	Not	Somewhat	Most
1.	Cost effective	31 (15.50%)	46 (23.00%)	123 (61.50%)
2.	Simplicity	25 (12.50%)	57 (28.50%)	118 (59.00%)
3.	Availability/Accessibility	36 (18.00%)	56 (28.00%)	108 (54.00%)
4.	Adaptability	22 (11.00%)	81 (40.50%)	97 (48.50%)
5.	Rationality	30 (15.00%)	74 (37.00%)	96 (48.00%)
6.	Sustainability	20 (10.00%)	93 (46.50%)	87 (43.50%)

(Figures in parenthesis indicate percent value)

The perceived effectiveness of Harjora plant (*Cissampelos quadrangularicus*) was studied and result were presented in at table 18 the data depicts that the majority of the respondents i.e., about 61.50 per cent use it due to its cost effectiveness, because it is available almost free of cost in the rural area on road side and besides.

Further 59.00 per cent perceived it is simple and easy to use following by its availability (54.00 %) and adaptability (48.50 %).

Table-19 Distribution of respondent for perceived effectiveness of Harjora plant (*Cissampelos quadrangularicus*) towards bone fracture or, sprain and swelling

S.N.	Categories (score)	Frequency	Percentage
1.	Low (0-4)	21	10.50
2.	Medium (5-8)	64	32.00
3.	High (9-12)	115	57.50

The respondent were categorised into low, medium and high as per their perceived effectiveness towards use of Harjora plants in bone fracture and results was presented in table

19. It is clear from this table that 57.50 per cent of responders were under high category followed by medium category (32.00%) with respect of effectiveness as perceived by them. This trend was found due to its miracle effect (as expressed by same older people) in bone healing and it's easily availability at almost negligible cost.

Table-20 Perceived effectiveness of Tisi or Flax (*Linum usitatissimum*) seed oil in case of constipation in animals among livestock owners

S.N.	Variables	Not	Somewhat	Most
1.	Cost effective	39 (19.50%)	53 (26.50%)	108 (54.00%)
2.	Simplicity/Complexity	21 (10.50%)	64 (32.00%)	115 (57.50%)
3.	Availability/Accessibility	42 (21.00%)	59 (29.50%)	99 (49.50%)
4.	Adaptability	24 (12.00%)	85 (42.50%)	91 (45.50%)
5.	Rationality	22 (11.00%)	92 (46.00%)	86 (43.00%)
6.	Sustainability	19 (09.50%)	83 (41.50%)	98 (49.00%)

(Figures in parenthesis indicate percent value)

Perceived effectiveness of Tisi (*Linum usitatissimum*) was studied and data was presented in table 20. It is clear found this table that about 57.50 per cent perceived it due to its simplicity followed by 54.00 per cent due to its cost effectiveness.

Table-21 Distribution of respondent for perceived effectiveness of tisi or flax (*Linum usitatissimum*) seed oil in case of constipation

S.N.	Categories (score)	Frequency	Percentage
1.	Low (0-4)	18	09.00
2.	Medium (5-8)	79	39.50
3.	High (9-12)	103	51.50

The respondents were categorised into low, medium and high category's on the basis of their perceived effectiveness and it was found that about 51.50 per cent comes under high category followed by medium (39.50 %) category however only 09.00 per cent were under low category.

This trend was might be due to it wide awareness in the area and peoples were practicing this science generations in their family for betterment of livestock production.

Table-22 Perceived effectiveness of Hing (*Asafoetida*) and Ajwain (*Trachyspermum ammi*) towards bloat or, tympany in animals among livestock owners

S.N.	Variables	Not	Somewhat	Most
1.	Cost effective	44 (22.00%)	50 (25.00%)	106 (53.00%)
2.	Simplicity/Complexity	35 (17.50%)	71 (35.50%)	94 (47.00%)
3.	Availability/Accessibility	39 (19.50%)	63 (31.50%)	98 (49.00%)
4.	Adaptability	28 (14.00%)	95 (47.50%)	77 (38.50%)
5.	Rationality	24 (12.00%)	76 (38.00%)	100 (50.00%)
6.	Sustainability	29 (14.50%)	74 (37.00%)	97 (48.50%)

(Figures in parenthesis indicate percent value)

Perception of respondents towards use of Hing and Ajwain for treatment of tympany and bloat was studied and this collected data were presented in table 22. The table depicts that majority of the respondents i.e., 53.00 per cent perceived it as cheaper with compare to other products they were using for the treatment of tympany and bloat. About fifty per cent of the respondents perceived it effective towards rationality as it was used science generations in their family followed by easily availability (49.00 %).

Table-23 Distribution of respondent for perceived effectiveness of Hing (*Asafoetida*) and Ajwain (*Trachyspermum ammi*) towards bloat or, tympany

S.N.	Categories (score)	Frequency	Percentage
1.	Low (0-4)	36	18.00
2.	Medium (5-8)	72	36.00
3.	High (9-12)	92	46.00

The respondents were categorised into three groups viz, low, medium and high on the basis of their perceived effectiveness towards use of Hing and Ajwain for treating the animals in case of tympany and bloat and the results were presented in table 23. The table data clearly shows that the majority of the respondents i.e., about 46.00 per cent comes under high

categories followed by medium (63.00 %) category and only 18.00 per cent were in low category. This patterns of results was found due to its miracle effect of Hing and Ajwain for treating the animals in case of tympany and bloat and it's easily available in the nearby area; which motivate them to use it.

Table-24 Perceived effectiveness of unripe fruits Bael (*Aegle marmelos*) mixed with fresh leaf of Shisham (*Dalbergia sissoo*) towards diarrhoea or dysentery in animals among livestock owners

S.N.	Variables	Not	Somewhat	Most
1.	Cost effective	16 (08.00%)	38 (19.00%)	146 (73.00%)
2.	Simplicity/Complexity	40 (20.00%)	53 (26.50%)	107 (53.50%)
3.	Availability/Accessibility	32 (16.00%)	79 (39.50%)	89 (44.50%)
4.	Adaptability	29 (14.50%)	88 (44.00%)	83 (41.50%)
5.	Rationality	36 (18.00%)	91 (45.50%)	73 (36.50%)
6.	Sustainability	31 (15.50%)	83 (41.50%)	86 (43.00%)

(Figures in parenthesis indicate percent value)

Table 24 revealed that the perception of respondents towards effectiveness of Bael (*Aegle marmelos*) and Shisham (*Dalbergia sissoo*). It was found that 73.00 per cent of the respondents were perceived it as it is cheaper in terms of cost followed by its easy to use (53.50 %) hence it is easily available (44.50 %) in the local area and forest area.


Table-25 Distribution of respondent for perceived effectiveness of unripe fruits Bael (*Aegle marmelos*) mixed with fresh leaf of Shisham (*Dalbergia sissoo*) towards diarrhoea or dysentery

S.N.	Categories (score)	Frequency	Percentage
1.	Low (0-4)	28	14.00
2.	Medium (5-8)	69	34.50
3.	High (9-12)	103	51.50

The table 25 depicts the distribution of respondent toward perceived effectiveness of Bael and Shisham was found that the majority of the respondents i.e., about 51.50 per cent belong

to high category followed by medium (34.50 %) and low (14.00 %). It was might be due to its cheaper cost easy to use and availability in the local areas.





SUMMARY AND CONCLUSION

Chapter-5

SUMMARY AND CONCLUSION

The chapter presents a concise report of the investigation under the following sub-headings:

5.1 Summary

5.2 Salient findings of the study

5.3 Conclusions

5.4 Implications of the study

5.5 Future scope of the Research

5.1 Summary

Livestock rearing is an integral or essential component of Indian farming system. India has a very rich heritage of traditional health control and traditional treatment systems or local treatment knowledge that have been used for treatment of animals since time immemorial. These practices have been permeating starting with one generation down to the next by oral transmission and considered to be the holistic approach for livestock management. The indigenous technical knowledge (ITK) or local technical knowledge regarding animal husbandry is considered to be as old as domestication of various livestock species.

The current investigation entitled “Perceived effectiveness of indigenous technical knowledge (ITK) in animal husbandry, prevalent among Tharu tribes of Bihar” was carried out in West Champaran district of Bihar state with the following objectives. Out of 18 blocks of West Champaran district, 4 blocks which were having substantial higher Tharu tribal population, namely Bagha-2, Ramnagar, Gaunaha, and Mainatand were purposively selected for the study on the basis of demographic distribution of Tharu tribes. After selecting block, a list of farmers who had at least one livestock and practising indigenous technical knowledge (ITK) was prepared from each block, 50 livestock owners which are known to use of indigenous technical knowledge (ITK) and 25 traditional healers which were considered to be knowledgeable in indigenous technical knowledge (ITK) in animal husbandry in surrounding Tharuhat area were selected randomly with the help of local community leaders (Gumasta),

staffs of veterinary hospitals and local NGOs. The Tharu tribal respondents were interviewed personally through a structured interview schedule by the investigator. The responses were recorded for, personal and socio-economic characteristics (age, education, occupation, family size, land holding, herd size, and annual income), communication characteristics (extension agency contact, mass media exposure, informal source of information), documentation of indigenous technical knowledge (ITK), awareness of indigenous technical knowledge (ITK), adoption of indigenous technical knowledge and perceived effectiveness of indigenous technical knowledge (ITK) (cost, simplicity/complexity, availability/accessibility, adaptability, rationality, sustainability). Indigenous technical practices in animal husbandry among Tharu tribes community, incorporating breeding, feeding and health care practices. These responses (livestock owners and traditional healers) were coded, compiled, tabulated and subjected to statistical analysis.

5.2 Salient findings of the study

The salient findings of the study are summarized here as:

5.2.1 Personal and socio-economic characteristics.

1. About 42.00 per cent of the livestock owners belongs to middle age group of 30-50 year followed by old (30.00%) and young (27.70%) respectively, whereas about 68.00 per cent of traditional healers belongs to old age category followed by middle age (26.00%) and young (06.00%) respectively.
2. Majority (39.00%) of the livestock owners had education up to primary school level followed by 27.50 per cent of had livestock owners education up to high school level, 24.50 per cent were illiterate, 09.00 per cent had education up to graduate and above respectively, whereas 41.00 per cent of the traditional healers were illiterate followed by primary school level (35.00%), high school level (18.00%) and only 06.00 per cent had educated up to graduate and above respectively.
3. Most of the livestock owners (33.00%) had agriculture as their main occupation followed by 28.50 per cent were animal husbandry, 21.00 per cent were in labourers, 15.50 per cent were in service sector and only 02.00 per cent were doing business as their main occupation, whereas about 47.00 per cent of traditional healers had animal husbandry as their main occupation followed by agriculture (30.00%), service

(12.00%), labourers (10.00%) and only 01.00 per cent had were doing business respectively.

4. About 51.00 per cent of the livestock owners having medium (6-9 member) family size followed by small (27.50%) and large (21.50%) respectively, whereas about 67.00 per cent of the traditional healers belongs to medium family size category followed by large (22.00%) and small (11.00%) respectively.
5. Most of the livestock owners (48.50%) having marginal (<1 hectares) land holding, whereas about 66.00 per cent traditional healers having small (1-2 hectares) land holding category.
6. Maximum number (54.50%) of the livestock owners had medium herd size (11-20 livestock) followed by 28.50 per cent livestock owners who had large herd size (>20 livestock) and about 17.00 per cent of the livestock owners had small (<10 livestock) herd size, whereas about 59.00 per cent traditional healers had also medium herd size followed by small (27.00%) and large (14.00%) respectively.
7. Majority (56.00%) of the livestock owners had medium (21-40 thousand) level of annual income derived from various sources followed by 29.50 per cent had high (>40 thousand) level and 14.50 per cent had low (<20 thousand) level of income respectively, whereas 60.00 per cent of the traditional healers had high level of annual income followed by medium (26.00%) and low (14.00%) level respectively.

5.2.2 Communication characteristics of the respondents (livestock owners and traditional healers).

1. It was studied and found that the information obtained from livestock owners, the animal husbandry officer/staffs are the most important source and channel of information regarding indigenous technical knowledge (ITK) in various animal husbandry practices followed by scientists, milk supervisors, and Jiwika workers which were ranked as 2nd, 3rd and 4th respectively whereas the data obtained from traditional healers, the scientists are the most important source of information regarding ITK in various animal husbandry practices.
2. The information regarding use of mass media in ITK among animal husbandry practices was obtained by livestock owners and traditional healers and it was found that the radio was the most potent source of information regarding improved animal

husbandry practices followed by kisan mela which are frequently organised by local NGOs, ATMAAs, and other agencies regularly.

3. Majority of livestock owners and traditional healers had obtained informal information source from ancestor regarding indigenous technical knowledge (ITK) in various animal husbandry practices.

5.2.2 Documentation of Indigenous Technical Knowledge (ITK).

1. Altogether eighty nine different ITK that had been documented in the area of breeding, feeding and health care practices for the purpose of the study.
2. The area of breeding, the people were practicing seven ITKs. Among which use of 250-300 gms mung (*Vigna radiata*) sprouts and 400-500 gms wheat (*Triticum aestivum*) sprouts fed to animal daily for 15 days to one month to induce heat and increase conception rate was most effective.
3. 100-200 gms of satawar (*Asparagus racemosus*) root powder, 1 kg of gurr (Jaggery), 100-200 gms of ajwain (*Trachyspermum ammi*), are mixed and boiled in 5.0 liters, of water. The extract liquid is cooled and provided to the animal for the treatment of retention of placenta (50-100 ml BID for 4-5 days).
4. It was found during the study that six ITKs were dominantly used by the local tribes for nutritional feeding of their livestock. Among which the dairy animals were provided 200 gms satawar (*Asparagus racemosus*) root 7-10 days in a month to increases the milk yielding of animal. It also helps to improve the uterine health were mostly fed by the respondents.
5. In the area of health care it was found that 76 practices were prevalent among the tribal people. Use of 50-60gm of jeera or, cumin (*Cuminum cyminum*) seed powder and 10 gm of black salt were mixed with 1 litres of water and given orally for 4-5 days were most commonly used by the respondents to animals affecting from indigestion.
6. 250-300 gms of Isabgol (Psyllium) husk mixed in 1-2 liters of lukewarm water or milk and fed to the animals in the treatment of constipation.
7. Unripe fruits bael (*Aegle marmelos*) mixed with fresh leaf of shisham (*Dalbergia sissoo*) was fed orally to the animals to cure the bloody diarrhoea or, dysentery in animals.

8. 25-50 gms of each hing (*Asafoetida*) and ajwain (*Trachyspermum ammi*) mixed and fed orally 50-60 gms twice daily to the animal in case of bloat as well as abdominal pain and discomfort.
9. Leaves of Banana tree (*Musa paradisiaca*) were ground and its juice was given orally to the animal twice daily for treatment of ulcer.
10. Powdered mixture of leaves or stem of green chiretta or, kalmegh (*Andrographis paniculata*) and neem (*Azadirachta indica*) seeds each of 50 gms was fed orally to the animal in case of fever.
11. A paste prepared from equal part of mehdi (*Lawsonia inermis*) leaves, turmeric or, haldi (*Curcuma longa*), harjora (*Cissampelos quadrangularis*) leaves and cactus (*Cactaceae juss*) stems is applied and support is provided by bamboo stick (*Bambusa auriculata*) externally.
12. Powdered Sanai seed (*Crotalaria juncea*) was mixed with coconut oil (*Cocos nucifera*) and applied topically on the lacerated wound.
13. Extract of bark of Babul (*Acacia arabica*) boiled in water. When this suspension was cooled down, it was applied topically on the feet of affected animal and 500-600 gms of giloy or, amarlata (*Tinospora cordifolia*) was ground and given twice a day.
14. 50-60 gms common salt (*Sodium chloride*) was added to 250-300 ml of mustard oil or, sarso tel (*Brassica campestris*) and this solution was applied all over the body of animal for treatment of ectoparasites.
15. 50-60 gms paste prepared from fresh leaves of sesame or, til (*Sesamum indicum*) mixed with 10-15 gms of rock salt and 250 gms of butter milk or, cream of milk are fed for removal of internal parasites to the animals.
16. Juice extracted from 500-600 gms of mulberry or, tutt (*Morus alba*) leaves mixed with jaggery or, gur and cow ghee are applied over the affected area of udder in treatment of mastitis.
17. Leaves, seeds, stem bark and root bark of siris tree (*Albizia lebbbeck*) were grounded and fed to the animal for treatment of snake bite.

5.2.3 Extent of Awareness and Adoption of most commonly used Indigenous Technical Knowledge (ITK) in Tharuhat area

1. Most of the livestock owners (45.50 %) were from medium category (26-50 %) and they were aware of the most common practices used in ITKs. These practices were adopted by (46.00 %) under medium category (26-50 %) of the livestock owners.

5.2.4 Perceived effectiveness of most commonly used Indigenous Technical Knowledge (ITKs)

1. A total of five most commonly used ITK were selected to get the perceived effectiveness of the livestock owners in terms of cost effectiveness, simplicity, availability/accessibility, adaptability, rationality and sustainability of selected commonly used ITK viz. Roots of satawar for increasing milk production was used by Tharu tribes and majority (61.00 per cent) of respondents were perceived it as easy to use followed by 58.00 per cent perceived it as easily available in nearby village and 54.50 per cent of respondents perceived as way cost effective in use.
2. Harjora plant stems and leaves were used by Tharu tribes in bone fracture treatment it was found that about 61.50 per cent use it due to its cost effectiveness, because it is available almost free of cost in the rural area on road side and besides followed by 59.00 per cent perceived it is simple and easy to use following by its availability (54.00 %) and adaptability (48.50 %).
3. Use of Tisi oil was done in case of constipation in livestock and it is found that about 57.50 per cent respondents perceived simple in use and understand followed by 54.00 per cent respondent were perceived it cost effective.
4. Perception of respondents towards use of Hing and Ajwain for treatment of tympany and bloat was studied and it was found that majority of the respondents (53.00 %) perceived it as cheaper with compare to other products. About half (50.00 %) of the respondents perceived it effective towards rationality as it was used since generations in their family followed by (49.00 %) easily availability.
5. Use unripe Bael and Shisham for treatment of diarrhoea and dysentery were done by Tharu peoples and it was found that 73.00 per cent of the respondents were perceived it as it is cheaper in terms of cost followed by its easy to use (53.50 %) hence it is easily available (44.50 %) in the local area and forest area.

5.3 Conclusions

This study was carried out to study on indigenous technical knowledge (ITK) in animal husbandry among Tharu tribes (livestock owners and traditional healers) of Bihar. The collection, documentation and dissemination pattern showed the richness of the time tested indigenous knowledge applied to animal husbandry in the region specified (i.e., Tharuhat area) under this study.

On the basis of results and findings of the present study, the following conclusions have been drawn.

1. Majority of the respondents were having medium and old age category, low education level, mostly doing agriculture and animal husbandry for their livelihood, having medium (6-9 member) family size and had medium (21-40 thousand) and high (>40 thousand) level of annual income.
2. Communication characteristics the animal husbandry officer/staffs for extension agency contact, radio for mass media exposure and ancestor for informal source of information are the most important source and channel of information regarding indigenous technical knowledge (ITK).
3. Farmers of the study area (i.e., Tharuhat area) had well knowledge about use of indigenous practices in different areas of livestock rearing i.e., Breeding, Feeding and Health care. About 89 indigenous practices in those areas were documented. Which were used by Tharu people for livestock rearing.
4. The finding revealed that about half (45.50 %) of the respondents were found in medium category of awareness for given set of ITKs followed by 29.50 per cent of respondents were in low awareness category and 15.50 per cent of respondent were in high awareness level for given set of ITKs.
5. Similarly, it was also observed that about half (46.00 %) of the respondents were found in medium level of adoption and 30.50 per cent of respondent were found in low level of adoption for given set of ITKs followed by 14.50 per cent of respondents were in high level of adoption for given set of ITKs.
6. The livestock owners perceived ITK as more favourably accepted among the Tharu communities owing to its cost effectiveness, easy to use, local availability in the flora and fauna of the village and sustainability.

7. Easy availability of indigenous plants, deep knowledge and trust regarding ITK were the main factors that determine the use of ITKs by the livestock owners of Tharu tribes.

5.4 Implications of the study

This research contributes the knowledge on indigenous technical knowledge possessed by Tharu tribes of West Champaran district of Bihar, which is well known for its traditional culture and values. Based on the research findings, implications of this study can be summarized as follows:

1. The region specificity (i.e., Tharuhat region) of the present study as well as richness of the documented ITK in the region implies that similar studies can be taken up for geographically diverse Indian subcontinent to prepare authentic and real knowledge base.
2. Extension functionaries should give attention to the ITK with high validity scores and having less expenditure and prompt availability as an alternative to Modern Veterinary Drug.
3. Refresher training courses on ITK should be organised based on field problems.
4. Involvement of livestock owners, traditional healers, local leaders, veterinary staffs and non-government organisations like jiwika worker in the project identification, implementation, review and monitoring process is an effective method of sharing knowledge and skills.
5. Involvement of professional Vaidya and local traditional healers in the team of researchers for the plant identification, use and harvesting practices is beneficial, because they have practical knowledge and experience. They also have good knowledge about the distribution of major medicinal plants in the locality.
6. Setting up regional work stations for the collection, documentation and perceived effectiveness of information on prevailing ITK as well as imparting education and training for the people who are interested in ITK. It is also necessary to establish sub centres in interior places and in remote areas of the country to impart to say above objective.
7. Emphasis should be given for changes in the B. V. Sc. Program for veterinary graduates. The curriculum should be revised with inclusion of indigenous veterinary medicines.

8. This research offers wide perspectives for understanding and documenting ITK which needs attention of planners, policy makers and extension personnel.

5.5 Future scope of the Research

Based on the findings and experiences of the present study of ITK, following areas were identified where further research could be contemplated.

1. The study was confined to only one district of Bihar state but Tharu tribes also found other parts of India. Hence, generalization of the study cannot be made elsewhere, in the way that these ITK are also used in other areas. Similar studies have to be concluded in other parts of the country where indigenous technical practices in India.
2. The present study has been considered only in Animal Husbandry; likewise other areas can also be taken up, for documentation of indigenous practices.
3. The documented indigenous practices can be taken up by different institutions to test the effectiveness and validation in the laboratory.
4. Research with domain of “Intellectual Property Rights on indigenous medicines used by farmers in the area of dairying” should also be incorporated.
5. As most of the ITKs relevant to animal health care, involves the use of herbal and medicinal plants, the cultivation of these plants can be encouraged.
6. Farmers Participatory Research for evolving appropriate technologies based on indigenous knowledge systems.





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APPENDIX

APPENDIX

प्रसार शिक्षा विभाग
बिहार पशुचिकित्सा माहविद्यालय, पटना – 14
(शोध प्रश्नावली)

क्रमांक सं०.....

दिनांक.....

(A) सामान्य एवं व्यक्तिगत जानकारी :-

1. उत्तरदाता का नाम

2. ग्राम

3. प्रखण्ड

4. आयु वर्ष

5. लिंग – पुरुष/ महिला

6. शैक्षणिक योग्यता ()

a) अशिक्षित (0)

b) प्राथमिक स्कूल तक (1)

c) हाई स्कूल तक (2)

d) स्नातक एवं उपर (3)

7. पेशा () मुख्य पेशा

सहायक पेशा

a) मजदुरी

b) खेती

c) पशुपालन

d) व्यवसाय

e) नौकरी

f) अन्य

8. परिवार –

i. परिवार के सदस्यों की संख्या.....

ii. परिवार का प्रकार.....

9. भूमि स्वामित्व : –

- a) सीमान्त (< 1 ha)
- b) छोटा (1.1 – 2 ha)
- c) माध्यम (2.1 – 4 ha)
- d) बड़ा (> 4 ha)

10. पशुओं की संख्या : –

प्रजाति	विसुखी	दुधारू	बछड़े/बाछी	बैल/भैसा	कुल झुण्ड का आकार
i. गाय देशी					
ii. शंकर गाय					
iii. भैंस देशी					
iv. बकड़ी/भेड़					
v. अन्य					

11. वार्षिक आय :– पशुपालन से (रुपया/वर्ष)
अन्य श्रोत से (रुपया/वर्ष)

- a) कम (< 21,000)
- b) माध्यम (21,000-40,000)
- c) अधिक (> 40,000)

(B.) सूचना के श्रोत : –

(1.) आप निम्न प्रसार श्रोतो से कितनी बार संपर्क करते हैं। () : –

श्रोत	हमेशा (2)	कभी – कभी (1)	कभी – नहीं (0)
1. पशुचिकित्सक			
2. वैज्ञानिकगण			
3. दूधसुपरवाइजर			
4. जीविकाकार्यकर्ता			

(2.) आप निम्न मास मीडिया सुचना के श्रोत का कैसे प्रयोग करते है। () : –

श्रोत	हमेषा (2)	कभी – कभी (1)	कभी नहीं (0)
1. रेडियों			
2. टी0 वी0			
3. अखबार			
4. पत्रिका			
5. पोस्टर			
6. किसान मेला			
7. प्रदर्शनी			

(3.) आप निम्न अनौपचारिक सुचना के श्रोतो का कैसे उपयोग है। () : –

श्रोत	हमेषा (2)	कभी – कभी (1)	कभी नहीं (0)
1. पूर्वज			
2. पड़ोसी			
3. वैध			
4. ओझा			
5. मुखिया			

(C.) देशज तकनिक का ज्ञान : –

(1.) आप अपने पशुओं के स्वास्थ्य रक्षा हेतु एवं बीमारीयों से निजाद हेतु किन – किन देशज तकनीको का प्रयोग करते है।

क्रम संख्या	रोंग / प्रबन्धन	देशज तकनिकि
(1)		
(2)		
(3)		
(4)		
(5)		

(6)

(7)

(8)

(9)

(10)

खण्ड – ख

(D) देशज तकनिकि ज्ञान की जागरूकता (Awareness) : –

क्र. सं.	देशज तकनिकि ज्ञान	जागरूकता (Awareness)		
		पूर्णतया (2)	थोड़ा – बहुत (1)	नहीं (0)
1.	स्तवारी के मूल (जड़) का उपयोग दूध बढ़ाने के एवं जेर गिरने के लिए जाता है।			
2.	हड़जोड़ के पतों का प्रयोग टूटे हड्डी को जोड़ने तथा हड्डी के दर्द एवं सूजन दूर करने में दिया जाता है।			
3.	पशुओं में कब्ज होने पर तीसी के तेल पीलाने से जल्द लाभ मिलता है।			
4.	गैस एवं पेट दर्द की समस्या में हिंग तथा अजवाइन का अर्क (पानी) पीलाने से दूर होती है।			
5.	कच्चा बेल तथा शीशम के ताजा पत्ता खिलाने से दस्त/खूनी दस्त से निजात मिलता है।			

(E) देशज तकनिकि ज्ञान की अंगीकरण (Adoption) : – ()

क्र. सं.	देशज तकनिकि ज्ञान	अंगीकरण (Adoption)	
		हाँ(1)	नहीं(0)
1.	क्या आप पशुओं का दूध उत्पादन बढ़ाने एवं जेर गिराने के लिए सतावरी के मूल (जड़) का उपयोग करते हैं?		
2.	क्या आप पशुओं के टूटे हड्डी को जोड़ने एवं हड्डी के दर्द एवं सूजन में हड़जोड़ के पतों का उपयोग करते हैं?		
3.	क्या आप पशुओं में कब्ज की समस्या होने पर तीसी के तेल को पिलाते हैं?		
4.	क्या आप गैस एवं पेट दर्द की समस्या को दूर करने के लिए हिंग तथा अजवाइन का अर्क (पानी) पीलाते हैं?		
5.	क्या आप पशुओं में दस्त/खूनी दस्त की समस्या को ठीक करने के लिए कच्चा बेल तथा ' शीशम के ताजा पत्ता का उपयोग करते हैं ?		

(F) देशज तकनिकि ज्ञान की कथित प्रभावशिलता (Effectiveness) : –

(F1) पशुओं में दूध उत्पादन बढ़ाने एवं जेर गिराने के लिए सतवार के मूल (जड़) का उपयोग निम्न द्रष्टि से कितना प्रभावी है।

क्र. सं.	चर वस्तुयें (Variables)	नहीं (0)	थोड़ा – बहुत (1)	हाँ (2)
1.	कम लागत में प्रयोग किया जा सकता है। (Cost)			
2.	इसके प्रयोग को आसानी से समझा जा सकता है। (Simplicity/Complexity)			
3.	देशज चीजे आपको आसानी से उपलब्ध होती है। (Availability/Accessibility)			
4.	इसके प्रयोग में कोई परेशानी नहीं है। (Adaptability)			
5.	इसका लाभ संतोषप्रद है। (Rationality)			
6.	इसे आप हमेशाप्रयोग करते हैं, तथा प्रकृति पर कोई दुस्प्रभाव नहीं पड़ता है। (Sustainability)			

(F2) पशुओं में टूटे हड्डी को जोड़ने एवं हड्डी के दर्द एवं सूजन में हड़जोड़ के पत्तों का उपयोग निम्न द्रष्टि से कितना प्रभावकारी है।

क्र. सं.	चर वस्तुयें (Variables)	नहीं (0)	थोड़ा – बहुत (1)	हाँ (2)
1.	कम लागत में प्रयोग किया जा सकता है। (Cost)			
2.	इसके प्रयोग को आसानी से समझा जा सकता है। (Simplicity/Complexity)			
3.	देशज चीजे आपको आसानी से उपलब्ध होती है। (Availability/Accessibility)			
4.	इसके प्रयोग में कोई परेशानी नहीं है। (Adaptability)			
5.	इसका लाभ संतोषप्रद है। (Rationality)			
6.	इसे आप हमेशाप्रयोग करते हैं, तथा प्रकृति पर कोई दुस्प्रभाव नहीं पड़ता है। (Sustainability)			

(F3) पशुओं में कब्ज की समस्या होने पर तीसी के तेल को पिलाना निम्न द्रष्टि से कितना प्रभावकारी है।

क्र. सं.	चर वस्तुयें (Variables)	नहीं (0)	थोड़ा – बहुत (1)	हाँ (2)
1.	कम लागत में प्रयोग किया जा सकता है। (Cost)			
2.	इसके प्रयोग को आसानी से समझा जा सकता है। (Simplicity/Complexity)			
3.	देशज चीजे आपको आसानी से उपलब्ध होती है। (Availability/Accessibility)			
4.	इसके प्रयोग में कोई परेशानी नहीं है। (Adaptability)			
5.	इसका लाभ संतोषप्रद है। (Rationality)			
6.	इसे आप हमेशाप्रयोग करते हैं, तथा प्रकृति पर कोई दुस्प्रभाव नहीं पड़ता है। (Sustainability)			

(F4) पशुओं में गैस एवं पेट दर्द की समस्या को दूर करने के लिए हिंग तथा अजवाइन के अर्क (पानी) का उपयोग निम्न द्रष्टि से कितना प्रभावकारी है।

क्र. सं.	चर वस्तुयें (Variables)	नहीं (0)	थोड़ा – बहुत (1)	हाँ (2)
1.	कम लागत में प्रयोग किया जा सकता है। (Cost)			
2.	इसके प्रयोग को आसानी से समझा जा सकता है। (Simplicity/Complexity)			
3.	देशज चीजे आपको आसानी से उपलब्ध होती है। (Availability/Accessibility)			
4.	इसके प्रयोग में कोई परेशानी नहीं है। (Adaptability)			
5.	इसका लाभ संतोषप्रद है। (Rationality)			
6.	इसे आप हमेशाप्रयोग करते हैं, तथा प्रकृति पर कोई दुस्प्रभाव नहीं पड़ता है। (Sustainability)			

(F5) पशुओं में दस्त/ खूनी दस्त की समस्या को ठीक करने के लिए कच्चा बेल तथा शीशम के ताजा पत्तों का प्रयोग निम्न द्रष्टि से कितना प्रभावकारी हैं।

क्र. सं.	चर वस्तुयें (Variables)	नहीं (0)	थोड़ा – बहुत (1)	हाँ (2)
1.	कम लागत में प्रयोग किया जा सकता है। (Cost)			
2.	इसके प्रयोग को आसानी से समझा जा सकता है। (Simplicity/Complexity)			
3.	देशज चीजे आपको आसानी से उपलब्ध होती है। (Availability/Accessibility)			
4.	इसके प्रयोग में कोई परेशानी नहीं है। (Adaptability)			
5.	इसका लाभ संतोषप्रद है। (Rationality)			
6.	इसे आप हमोशाप्रयोग करते हैं, तथा प्रकृति पर कोई दुस्प्रभाव नहीं पड़ता है। (Sustainability)			



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MATRIC	HIGH SCHOOL SHAMBHUPUR KOARI	BSEB, PATNA	2005	62%
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