

CHAPTER - I

INTRODUCTION

1.1 Background of the Study

Nepal is a beautiful landlocked and within land linked country between two most populous of the worlds, India is the east south and west and china in the north. Nepal is a home to natural beauty with traces of artifacts. Nepal is an agricultural country having 66 percent people directly engaged in farming. Farming is subsistent in nature and crop is mostly integrated with livestock. Where 26.6 million human populations depend in agricultural sector out of which 83 percent population resides in rural area and 78 percent people are highly dependent on agriculture(Central Bureau Ststistics, 2015)

Agricultural development is the part of the both crop and livestock which is various part of in the world dating back some 10-12 thousand years, and it has been termed from the “Neolithic Revolution”. The gradually evolution from the nomadic and hunting and food gathering to promote food security is thought to have been influenced by various factors which is environmental opportunities, socio-economic drives, larger and more dependable supplies of food together with their requisite investment of time and labor ultimately resulted in the development of permanent settlements, societal complexity, and the emergence new technology. At some points there was a transition from coincidental husbandry of animal’s dependent on natural resources (for instance, pasture) to purposeful integration of animals and crops such that temporal spatial utilized resources or waste products such as crops residues and animals manure ware realized(Hilimire, 2011).

Farming system is a resource management strategy to achieve economic and sustain agricultural production to meet diverse requirement of the farm household while preserving the resource base and maintaining high environmental quality. The farming

system in its real sense will help to lift the economy of agriculture and standard of living of the farmers(Swaminathan, 1996)

Farming system is a set of agro economic activities that are interrelated and interact with themselves in a particular agrarian setting. It is a mix of farm enterprises to which farm families allocate its resources in order to efficiently utilize the existing enterprises for increasing the productivity and profitability of the farm(Sharma, 1991).

Integrated farming system is the comprises of crop the components, dairy, poultry, piggery and fishery was the most suitable and efficient farming system model giving the highest system productivity and ensured the multiple uses of water. This model generated significantly higher levels of employment than rice-wheat system(Soni, 2014).

Integrated farming system is the system invariably having combination of crop and animal components. Where, the product and byproduct of one component can be used for another component. Integrated farming and mixed farming benefits more in terms of economic returns than the mono crops. The demand for food is increasing day by day due to decreased food production; there is continuous conversion of agricultural lands to residential lands and also the number of farmers working in the field is drastically reduced(Vasuden, 2014).

Integrated Farming system is one of the approaches to agricultural research and development that views the whole farm as a system and focuses on (i) the interdependencies between the components under the Control of members of the household and (ii) how these components interact with the physical, biological and socio-economic factors which is not under the Control of households(Sirohi, 1980).

In Chitwan district, and inner terai, rice-maize-mustard is a predominant cropping pattern(Timsina & subedi, 1986). In Janakpur and parsa districts (bothterais), farmers have been growing a green manure crop proved to successfully increase rice yields.

The farming system revolves around better utilization of time, money, resources and family labor and also the farm family gets scope for gainful employment round the year

thereby ensuring good income and higher standard of living even from the small holdings(Little, 1987)

Farming system specifically to a crop combination or enterprise-mix in which the products and or the byproducts of one enterprise serves as the input for the production of other enterprises. It takes into account the consumption needs of the family, the economic factors like relative profitability of the technically feasible enterprises, availability of farm resources, infrastructure and institutions such as irrigation, marketing facilities including storage and transportation and credit, besides the agro-biological considerations, viz., interdependence if any among the various enterprises and the preferences of the individual farmers(Maji, 1991).

Integrated farming is the recycling of animal wastes and it is a complex interrelated matrix of soil, plants, animals, implements, power, labor, capital and other inputs controlled in part by farming families and influence to varying degree by political, economic, institutional and rest factors that operate at farm level. Under the existing agrarian structure, most of the rural farm families are of small and marginal in nature that are living below the poverty line with the continued threats to their livelihood security characterized by low in food security and income, unemployment, health problems, education etc. Due to this reason, these categories of farmers are poorly adopted to the changed farming scenario especially in rained areas(Sharma, 1991).

Integrated farming (IF) is a whole management system which aims to deliver more sustainable agriculture. It refers to agricultural systems that integrate livestock and crop production. Integrated farming is also called mixed farming. It is a farming system with simultaneous activities involving crop and animals. The main purpose of the integrated farming is that farming components support one another hence reducing external inputs(Lal & Miller, 1990).Further, this section of farming community is very much susceptible to the natural vagaries (drought & flood) and resulting in large scale migration to urban areas for seeking livelihood opportunities. Keeping in view of these problems, the innovation on IFS developed by University of Agricultural Sciences, Raichur (UASR) addresses the following major constraints have been demonstrated on farmer's farms in Zone 1&2 of Karnataka state during the year 2010 and 2011. To

ensures the consolidation of the natural resource base at farm level and offers better opportunities for adoption of improved technologies with the target of enhancement of overall production and productivity of the farm. To provide an opportunity to arrive at appropriate combination of the enterprise through interlinking of different farm enterprises for the effective use of natural resources available at farm level and for recycling of nutrients on the farm (Norman, 1978). And this technique ensures in the creation of better awareness on the adoption of technology which can lead to sustainable production process with on-farm employment creation to support livelihood of the rural farm families. On farm demonstrations (80 farm families) on integration of different components with crop in Integrated Farming system mode and recycling of resources within the system were organized in Zone 1 and 2 of northern Karnataka during 2010-2011. Villages and Farmers in the zone were randomly selected and rational information from Participatory Rural Appraisal (PRA). This information was used for redesigning the farming activities to develop tailor made IFS modules for different farming situations.

Farming system is a resource management strategy to achieve economic and sustained production to meet diverse requirements of farm households while preserving resource base and maintaining a high-level environmental quality (Lal & Miller, 1990)

Integrated farming system models developed in different parts of the country involving dairy, duckery, poultry, horticulture, apiary, pisciculture and plantation crops etc. along with crops, have been found to increase net profit significantly as compared to cropping alone. These IFS systems were also found more sustainable and employment generative. Net profit increase from Rs.22971/ha/annum in rice alone to Rs.31788/ha/annum in rice + fish + azolla. In Telangana zone of Andhra Pradesh, the major crops grown are rice, maize, jowar, groundnut, sugarcane and cotton and other components include buffalo, goat, sheep and poultry (Ganesan, Chinnaswami, Chandraskaran, Budhar, & Jayaseelan, 1991).

The integrated farming system is to maintain the production of food and other goods and services that contribute to food security and income generation to the rural poor. Other functions that are just as important are achieving environmental sustainability and contributing to agriculture sustainability (Chaudhary & Chaudhary, 1992).

Integrated farming system considered to be conducted on farmers' fields in Punjab conditions, gross profit was found to increase from Rs.81200/ha in cropping (Rice-wheat) alone to Rs.154000/ha in crop dairy and Rs.113200/- in fish piggery system of farming (Gill, et al., 2017).

The integration of crop with fish, poultry and goat, pig and fish resulted in higher productivity than adoption of conventional rice-rice alone and also 26.3 per cent higher productivity was reported in an IFS while compared to conventional rice-rice system. The productivity of IFS was 26.3 per cent higher than the conventional system. Among the various components the productivity was maximum in crop yield (46.32 per cent), closely followed by horticulture (16.77 per cent), dairy (42.26 per cent) and piggery (8.07 per cent) in the southern Karnataka state (Jangkaruz, 1979).

The IFS increased the productivity, profitability, employment generation by 48, 40 and 45 per cent respectively than the existing conventional farming system in Palladam district of Western Zone of Tamilnadu (Manjunatha, et al., 2014).

Integrated farming systems aim for increased productivity, profitability, food and nutritional security, sustainability, recycling of unutilized resource, Generation of income round the year, and increased employment generation. The objectives of farming system in general are converging on to analyze the human and socio-economic livelihood status after integrated farming, and to dig out the impact of integrated farming system in Khairahani Municipality of Chitwan. These integrated systems provide scope not only to augment income of the farmers but also bring improvement in soil health through recycling of organic wastes and thereby increase the overall productivity of the crop (Mandal, 2015). Thus, energy obtained from IFS in various forms is much higher than energy input, as the by-product/wastes of these associated enterprises provide all raw material and energy required for the food chain in another system. This complementarity when carefully chosen, keeping in view the soil and environmental conditions generates greater income.

Livestock is one of the important sources of cash income of the farm households. Livestock products which are sold for cash. The cash needs of the farm families are

mainly met through the sale of milk, yoghurt, cheese, ghee, Chhurpi, meat, egg and live animals and poultry. Generally, farm families in mountains raise Yak or Chauri(Himalayan breed of cow) and sheep, in hills cow, sheep, goat and rural poultry and in Terai buffalo, cow, goat and poultry. Poultry husbandry is emerging enterprise in Terai and hills. Human and animal labors are major sources of farm power(Bhandari, 2004).

In addition, Nepal grows a number of fruit and vegetable crops. Some important ones are Apple, peach, pear, plum, walnut, orange, lime, lemon, mango, lichi, banana, pineapple, papaya, cucumber, lady's finger, brinjal, pumpkin and several leafy vegetables. Fresh water fish culture is another emerging enterprise in Terai whereas rainbow trout in the hills and in the lower mountains (Raut, et al., 2010).

Khairahani Municipality, Chitwan was involved in Terai region also of different forms of agricultural crops as well as husbandry, integrated farming can be chosen as one of the best integrate most of the products into a single arena so that the productivity increases(Mandal, 2015).

At last, integrated farming system has got more relevance in the present-day farming to reap better harvest in the long range by maintaining a productive resource base on a holistic approach. The IFS approach introduces a change in the farming techniques for maximum production in the cropping pattern and takes care of optimal utilization of resources in Khairahani Municipality,Chitwan. The farm wastes are better recycled for productive purposes.

1.2 Statement of the Problem

The farming has played an important role in fulfilment of basic needs of the integrated farmer's in the Khairahani Municipality of Chitwan district. There are farms that individually do pig and fish farming. But this has one drawback, in the sense that the cost of managing food individually is quite high. Thus, the integrated farming would reduce the cost of keeping both the animals. Furthermore, the byproduct produced by the pig can be used as food for the fish, which helps in pig wastage management. The demand of the animal related product is high in the market. To meet the demand the current production

is being insufficient (Timsina&subedi, 1996). Therefore, this integrated farming somehow partially fulfill market demand. The unemployment rate in this municipality is also high. Most of the working manpower is forced to go foreign country to improve livelihood. To control such type of migration and provide employment with the use local resources, this type of farming is thought to be a good model.

In this Khairahani Municipality no researcher has yet researched about the integrated fish and pig farming and their impact on people's livelihood. In view of fulfilling the objectives of the present study, this research answers these following questions:

- What are the major farm products people have been using?
- What is the status of farm products?
- What is the relationship between farm products and people livelihood?
- What are the impacts of farm products on socio-economics condition of people in the study areas?

So, this thesis have assess the contribution of farm product on people's livelihood. Nowadays the inhabitants of Khairahani Municipality use the farm products from the nearest market.

1.3 Objective of the Study

The general objective is to assess the impact of integrated fish and pig farming system on livelihood and the specific objectives of the study are: -

- i) To assess the status of integrated farming system in study area.
- ii) To find out the impact of integrated farming system on livelihood in Khairahani Municipality.

1.4 Significance of the Study

Integrated farming systems aim for increased productivity, profitability, food and nutritional security, sustainability, recycling of unutilized resource, Generation of income round the year, and increased employment generation. The objectives of farming system in general are converging on to analyze the in-livelihood status after integrated farming,

and the to dig out the impact of integrated farming system in Khairahani Municipality of Chitwan, Integrated farming system (IFS) appear to be the possible solution to the continuous increase of demand for food production, stability of income and improvement of nutrition for the small and marginal farmers with limited resources. Activity as base will provide ways to recycle products and waste materials of one component as input through another linked component and reduce the cost of production of the products which will finally raise the total income of the farm. This becomes moderately essential as crop cultivation is subjected to a high degree of risk and provides only seasonal, irregular and uncertain income and employment to the farmers. With a view to mitigate the risk and uncertainty in agriculture, IFS serve as an informal insurance. These integrated systems provide scope not only to augment income of the farmers but also bring improvement in soil health through recycling of organic wastes and thereby increase the overall productivity of the crops (Mandal, 2015). Thus, energy obtained from IFS in various forms is much higher than energy input, as the by-product/wastes of these associated enterprises provide all raw material and energy required for the food chain in another system. This complementarity when carefully chosen, keeping in view the soil and environmental conditions generates greater income.

1.5 Limitation of the Study

This study have been limited on Khairahani Municipality of Chitwan district. The farmers using the integrated farming technique has been studied. The impact of the integrated farming on the livelihood of farmers will be studied in this research. This study will also revolve around find out the status of people using integrated farming technique. This won't study about the farming system using other techniques of farming such as intensive farming. Only the integrated farming on pig and fish i.e. pig-fish integrated farming has been studied.

1.6 Organization of the Study

This study is divided into five chapters. The first chapter deals with background, introduction of Integrated Farming System (IFS), statements of the problem, objective of the study, significance of the study, limitation of the study and organization of the study. The second chapter deals with literature review which included theoretical review and

previous of various studies. The third chapter included research methodology which included research design, selection of the study area, nature and source of data, census method, data collection and techniques, analysis and interpretation of data. The fourth chapter gives analysis and interpretation data. At last fifth chapter gives summary of the whole study along with finding, conclusion and recommendations.

CHAPTER- II

LITERATURE REVIEW

In this chapter, an attempt has been made to review some of the key studies which are relevant to the objectives of the study.

2.1 Theoretical Review

The integrated farming system is attempted to the maximize profitability with a different balance of inputs, directly towards environmental benefits, to those employed on the conventional system(Cook, 2000).

The first to introduce several goals in a farm level decision-making in agriculture. They analyzed the planning problem of a hypothetical 600 acres mixed farm in United Kingdom. The goals considered were maximum gross margin, minimum seasonal cash expense and provision of stable employment for the permanent labor throughout the year(Kathiresan, 2009).

In Chitwan district, and inner terai, rice-maize-mustard is a predominant cropping pattern (Timsina & subedi, 1986). In Janakpur and Parsa districts (Both terais), farmers have been growing a green manure crop proved to successfully increase rice yields.

In Malaysia, IFS is an inspirational example of how sustainable agriculture development can be achieved through globalization towards the empowerment of small farmers. During 8th Malaysian Plan period, agriculture sector has done justice by showing a marvelous growth. Stimulating integrated farming system is expected in order for the country to still produce food for the growing population while preserving the environment. It is a means of achieving sustainable agriculture in a manner that balances food production, profitability, safety, animal welfare, social responsibility and environmental care(Oksel, et al., 2009).

In China, fish ponds stocked with 60,000 fingerlings per ha (average weight 20–30g) of different species raised together with about 45–75 pigs/ha produced between 2–18 t. of fish and 4–7 t. of pigs (live weight) per ha/year (Bosma, et al., 2005).

The impact of mixed farming system on income and employment on small farms in Karnal district of Haryana. The results revealed that the utility of mixed farming system under which the farmers could gain higher net returns and thus rise above poverty line. The study also indicated that a combination of crop + dairy, crop + poultry and crop + poultry + dairy enterprises was more promising and beneficial in that order. The study further showed the potentiality to increase the net farm income on bullock-operated farm with relaxed credit constraints along with adoption of recommended technology (Manjunatha, et al., 2014).

In integrated farming system of the past, animals were used directly for food or to provide services such as power (drought animals). In addition, animals were employed indirectly to provide services such as weed and pest control, fertilization or pollination; or food items such as milk, egg or honey, meat. Animals were also a source of materials such as manure or leather that could be sold directly and converted to a value-add product, returning cash to the enterprises (Chauhan, 2002).

Integrated fish farming is generally considered particularly relevant to benefit the rural poor. In Asia, fish farming has been a part-time activity of peasant farmers, who developed it as an efficient means of utilizing farm resources to the maximum capacity (Mani, 2015).

Farming System in Mid-hills and tarais of Nepal are predominantly small farm-based and subsistence in nature. They are more intensive and diversity in the mid-hills than tarais. Rice is the major crop in all the joy-lying areas of terai and many areas of low to mid-hills. In addition, several other crops, including trees, are grown either in mixed or sequential fashions. Animals constitute a component of farming system. Many of the advanced farmers have evolved and sustained technologies by integrating crops and animals with rice. For instance, crop residues and by-products are essentially utilized for animal feeding and the manure from the animals are used for fertilizing the land. In addition, animals supply the main power for tillage. Still in other cases, green manuring crops are grown for better production of rice. The sustained technologies are results of coordination among men, women and children in the households. Both men and women in the households are involved in farming (Timsina & subedi, 1986).

In integration farming system simultaneous production of fish in ponds, with pigs, duck or chicken rearing in pens, beside or over the ponds constitutes a continuous organic fertilization of the pond by the livestock. This practice increases the efficiency and rent ability of both livestock farming and fish culture through the profitable utilization of animal and feed wastes (Agbonlabor, et al., 2003).

Farming system is a resource management strategy to achieve economic and sustained agricultural production to meet diverse requirements of farm livelihood while preserving resource base and maintaining a high level of environment quality (Singh, et al., 2011).

Farming system is a set of agro-economic activities that are interrelated and interact with themselves in a particular agrariansetting. It is a mix of farmer enterprises to which farm families allocate its resources in order to efficiently utilize the existing enterprises for increasing the productivity and existing enterprises for increasing the productivity and profitability of the farm. These farmer enterprises are crop, livestock, aquaculture, agroforestry and Agri-horticulture (Rangaswamy, et al., 1996).

Farming system is a mix of farm enterprises such as crop, livestock, aquaculture, agro forestry and fruit crops to which farm family allocates its resources in order to efficiently manage the existing environment for the attainment of the family goal (Vanbrakel, et al., 2003).

Farming system is a decision-making unit comprising the farm household, cropping and livestock system that transform land, capital and labor into useful products that can be consumed or sold (Radhamani, et al., 2003).

Integrated farming system represents an appropriate combination of farm enterprises (cropping systems horticulture, livestock, fishery, forestry, and poultry) and the means available to the farmer to raise them for profitability. It interacts adequately with environment without dislocating the ecological and with environment without dislocating the ecological and socio-economic balance on one hand and attempts to meet the national goals on the other (Ramrao & Singh, 2005).

Farming system approach is a powerful tool for natural and human resource management in developing countries such as India. It is a multidisciplinary whole-farm approach and can be effectively employed in solving the problems of small and marginal farmers. The approach aims at increasing employment and income from small-holdings by integrating various farm enterprises and recycling crop residues and by-products within the farm itself (Chawla, et al., 2004).

Integrated Farming System is a complex interrelated matrix of labor, soil, plants, animals, implements, power, capital and other inputs controlled in part by farming families and influence to varying degree by political, economic, institutional and rest factors that operate at farm level. Under the existing agrarian structure, most of the rural farm families are of small and marginal in nature that are living below the poverty line with the continued threats to their livelihood security characterized by low in food security and income, unemployment, health problems, education etc. Due to this reason, these categories of farmers are poorly adopted to the changed farming scenario especially in rainfed areas (Ngambeki, et al., 1992).

In integrated farming waste is only a misplaced resource which can become a valuable material for another product” in IFS and Integrated farming system is commonly and narrowly associated with the direct use of fresh livestock manure in fish culture(FAO, 1977).

IFS as a mixed farming system that consists of at least two separate but logically interdependent parts of a crop and livestock enterprises(Okigbo, 1995).

The IFS as an aquaculture system that is integrated with livestock and in which fresh animal waste is used to feed fish and also reported that there are synergies and complementarity between enterprises that comprise a crop and animal component that form the basis of the concept of IFS. According to this concept, integration usually occurs when outputs (usually by-products) of one enterprise are used as inputs by another within the context of the farming system(Dendup, 2018).

The IFS as a mixed animal crop system where the animal component is often raised on agricultural waste products while the animal is used to cultivate the soil and provide manure to be used as fertilizer and fuel(Prein, 2002).

IFS as a component of farming systems which takes into account the concepts of minimizing risk, increasing production and profits whilst improving the utilization of organic wastes and crop residues (Radhamani, et al., 2003).

Integrated farming system as a type of mixed farming system that combines crop and livestock enterprises in a supplementary and / or complementary manner(Gangaiah & Dam, 2018).

IFS is a component of Farming System Research (FSR), introduces a change in the farming techniques for maximum production in the cropping pattern and takes care of optimal utilization of resources(Chandra, 2006).

Integrated farming is an integrated set of elements and activities that farmers perform in their farms under their resources and circumstances to maximize the productivity and net farm income on a sustainable basis(Roy, 2015).

Theintegration is made in such a way that the product i.e. output of one enterprise /component should be the input for the other enterprises with high degree of complementarity effects. Similarly, the authors stated that the rationale of IFS is to minimize the wastes from the various sub systems on the farm and thus it improves employment opportunities, nutritional security and income of the rural people(Naik, 2017).

IFS as an integrated mixed farming system is the practice of raising different yet dependent enterprises and when different enterprises are dependent, they are primarily complementary and supplementary to each other(Prakash, et al., 2015).

Farming system considered ofthe resource distribution and processes of resource use in a farming unit. Farming unit gives the flexibility to apply it in any specific instance to ageographical unit, an economic unit or to a unit displaying a particulartechnical pattern of resource use(Norman, 1978).

Integrated Farming system is one of the approaches to agricultural research and development that views the whole farm as a system and focuses on (i) the interdependencies between the components under the Control of members of the household and (ii) how these components interact with the physical, biological and socio-economic factors which is not under the Control of households (Walia & Kaur, 2013).

Integrated farming system specifically to a crop combination or enterprise-mix in which the products and or the byproducts of one enterprise serves as the input for the production of other enterprises. It takes into account the consumption needs of the family, the economic factors like relative profitability of the technically feasible enterprises, availability of farm resources, infrastructure and institutions such as irrigation, marketing facilities including storage and transportation and credit, besides the agro-biological considerations, viz. interdependence if any among the various enterprises and the preferences of the individual farmers (Tiwari, et al., 2006).

The intensive integrated farming systems as seven pillars that energy management, post-harvest management, choice of crops, include soil health care, water harvesting and management, crop and pest management far animals and other components of the farming system and information, skill, organization and management empowerment (Prein, 2002).

The concept of “farming system “has got more relevance in the present-day farming to reap better harvest in the long range by maintaining a productive resource base on a holistic approach. The IFS approach introduces a change in the farming techniques for maximum production in the cropping pattern and takes care of optimal utilization of resources. The farm wastes are better recycled for productive purposes. A judicious mix of agriculture enterprises like dairying, poultry, mushroom, piggery, fishery etc. suited to the local agro-climatic situations and socio-economic status of farmer would bring in prosperity in the farming (Rangaswamy, et al., 1996).

Integrated farming involving aquaculture defined broadly is the concurrent or sequential linkage between two or more activities, of which at least one is aquaculture. These may

occur directly on-site, or indirectly through off-site needs and opportunities, or both (Ansari, et al., 2013).

Integrated farming system conducted for the Benefits of integration are synergistic rather than additive; and the fish and livestock components may benefit to varying degrees. The term “waste” has not been omitted because of common usage but philosophically and practically it is better to consider wastes as “resources out of place (Yadav, et al., 2013).

Integrated farming system where high quality, organic, food, feed, and renewable energy are produced by using resources such as soil, water, air and nature as well as regulating factors to farm sustainably and with as little polluting inputs as possible (Gupta, 2012).

Including milch animals with crop activities and developed optimum plans under existing and improved technology level. They concluded that incomes of the small, medium and large farmers would increase by 44.06 per cent, 66.95 per cent and 76.96 per cent, respectively over the existing plan by adopting recommended technology. Crossbreed cows that were most profitable entered the solution. The study has not accounted for the other farm enterprises like poultry, apiculture and others (Jayanthi, et al., 2000).

In integrated farming system land use planning in Southern Karnataka and its relevance to agricultural policy. With the help of macro level optimization model, the authors delineated optimal cropping pattern for different agro-climatic regions in Karnataka. The results indicated that with rational reorganization of resources resulted a savings worth 35.65 per cent of land could produce the same level of output (Mohanty, et al., 2010).

In integrated farming attempts to determine optimum crop and dairy mix for small, medium and large farmers of Bangalore district, by using linear programming technique under varied capital situation. The results indicated that one cross breed cow for small farmers, one cross breed cow, one local dairy cow and one local dairy buffalo for medium farmers and none for large farmers in optimum plans for crop and dairy mix. As a result, the net returns increased by 45.77 per cent for small, 42.25 per cent for medium and 57.88 per cent for large farmers over existing resources (Chandragupta & Thomas, 2002).

In integrated farming system used linear programming considering a sample of 72-farm household in union territory of Delhi and examined the possibilities of increasing income and employment through introduction of dairy and poultry into crop farming system. On optimization with liberal credit facilities, the new enterprise system (crop + dairy + poultry) was found to increase labor employment besides augmenting income on small and marginal farms(Ravinder, 2014)

IFS is an optimum cropping plans of Bangalore north taluk of Karnataka using parametric linear programming (MOTAD). The results indicated that existing use of resources was less than optimum. The normative plans derived by MOTAD suggested that judicious use of resource would increase farm income, facilitate prompt repayment of loans, and create additional employment on small and large farms(Ramrao & Singh, 2005).

In integrated farming system found that introduction of duck-cum-fish culture into rice farming system resulted in an increase of net profit from Rs.13,790 to Rs. 24,117. The income per men per day increased from Rs. 37.78 in arable farming to Rs. 66.07 in mixed farming and an additional employment of 144 man-days was generated. Thus, by following an integrated farming, the farmers could engage themselves productively and augment farm income even in the off-season(Gupta, 2012).

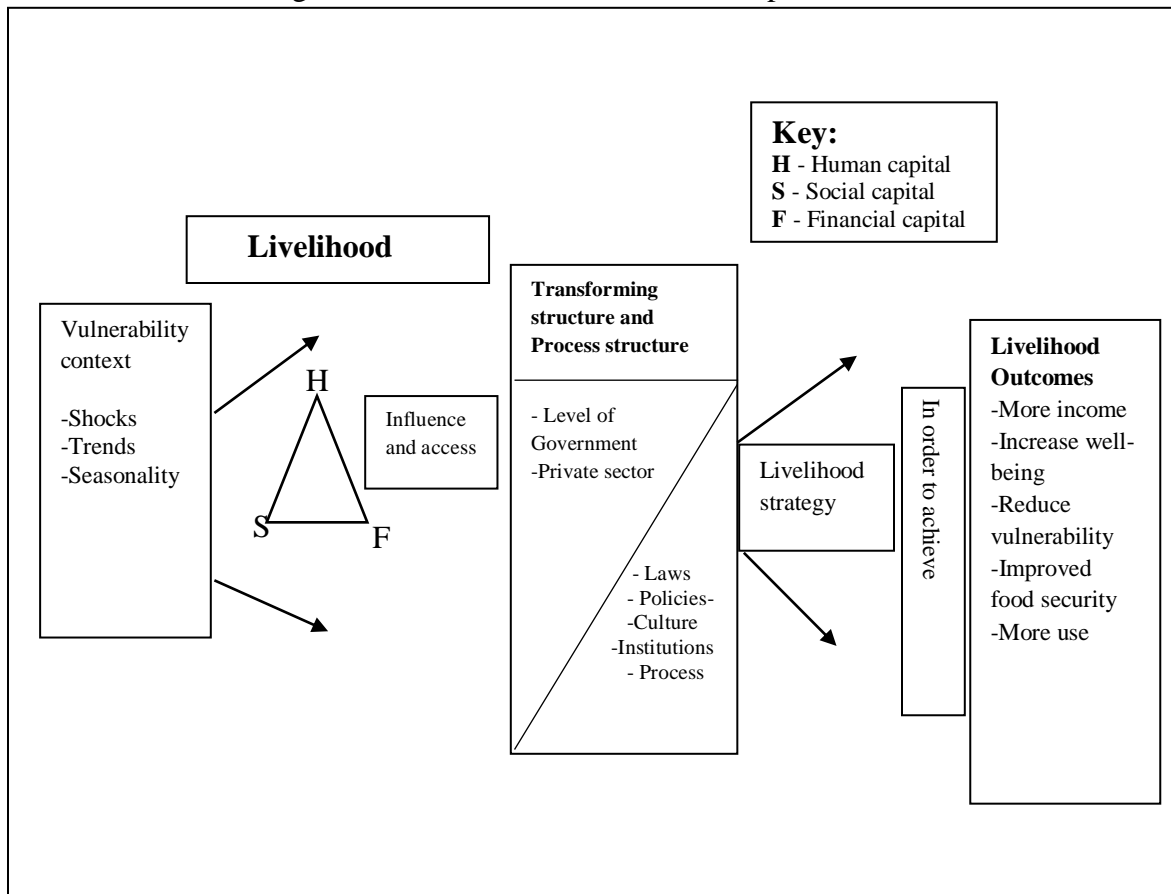
The integrated farming investigated the possibilities of increasing net farm income by including labor-intensive dairy enterprise and vegetables along with crops under existing levels of technology in Pakistan. Linear programming was used to determine the optimum allocation of resources and combination of activities on farms. Activities were those of producing crops and livestock; augmenting resources, namely hiring additional labor, consuming wheat and paddy produced on the farm; and selling surplus quantities of produce. Results were obtained on the optimum and feasible number of buffaloes, and optimum cropping patterns. Dairy animals (buffaloes) were found to be an essential part of farm plans. Besides providing milk and milk products, helped to secure net cash returns which could not be achieved through crops alone; provided employment for some of the family's excess labor; and served as a useful outlet for crop by-products which would otherwise go waste. Basically, the price of milk determined the profitability of

buffaloes. It is concluded that increased net cash returns can be achieved by mixed farming even with subsistence food restrictions, through efficient resource allocation and improved marketing practices(Sachinkumar, et al., 2012).

The potential for increasing farm employment through an efficient farming system. The study was conducted in Bangalore rural district of Karnataka. An efficient system is one with the minimum income variability commensurate with high incomes. The data was analyzed using linear programming and its complements MOTAD, multiple objective and compromise programming techniques. An efficient farm plan has the potential to increase farm income by 124 per cent for crop + poultry system of marginal farms, 53 per cent for crop + sericulture system of small farms and 85 per cent for crop + dairy + sericulture system of medium farms. The efficient farm plan generated the highest employment for crop + sericulture system in all the categories of farms. It can be concluded from the above studies that by optimizing the existing farming systems of different categories of farmers a regular flow of returns throughout the year and additional employment generation would be possible by integrating crop along with different livestock enterprises(Channabasavanna, et al., 2009).

2.2 Conceptual Framework

Figure: 1: Sustainable livelihood conceptual framework



Source: DFID Sustainable Livelihood framework (2008)

The vulnerability context frames the external environment in which people exist. This includes things like trends, shocks and seasonality, over which people have limited or no control. Assets are the capital of peoples which help to sustain the livelihood of the peoples. People's choice of livelihood strategies, as well as the degree of influence they have over policy, institutions and processes. Combination of these assets is required by people to improve their quality of life significantly on a sustainable basis. The institutions, policies, and social processes within the sustainable livelihoods framework shape people livelihoods. They operate at all levels, from the household to the international level, and in all spheres, from the most private to the most public. They also have a direct impact upon whether or not people have a feeling of inclusion and rights over resources. Livelihood strategies are the range and combination of activities that people undertake and choices that they make to achieve their livelihood goals, such as

productive activities, investment strategies and reproductive choices including: Farming, fishing, migration, business and self-employment etc. Livelihood outcomes are the achievements or outputs of livelihood strategies. More income, improved food security, physical security and peace, a secure job, shelter and good health, are some examples of livelihood outcomes (DFID, 2008)

2.3 Importance of Integrated Farming Systems

Integrated Farming systems necessary on Khairahani Municipality in Chitwan because it is a way of adoption for leads to sustainability and stability in farm income through multiple enterprises that aim at maximum utilization of available natural resources to meet the family needs. It aims at generating a threshold level of farm income required for the farm family to maintain sustained interest in farming thus preventing migration of people from farming sector (Timsina & Subedi, 1986).

Integrated farming system, which is a synonym to family farming, provides an opportunity to profitably engage the available man power in the farm family to the fullest extent throughout the year leading to higher income and family satisfaction. A good IFS aims at least dependence on outside resources and efficient recycling of available farm resources (Cook, 2000).

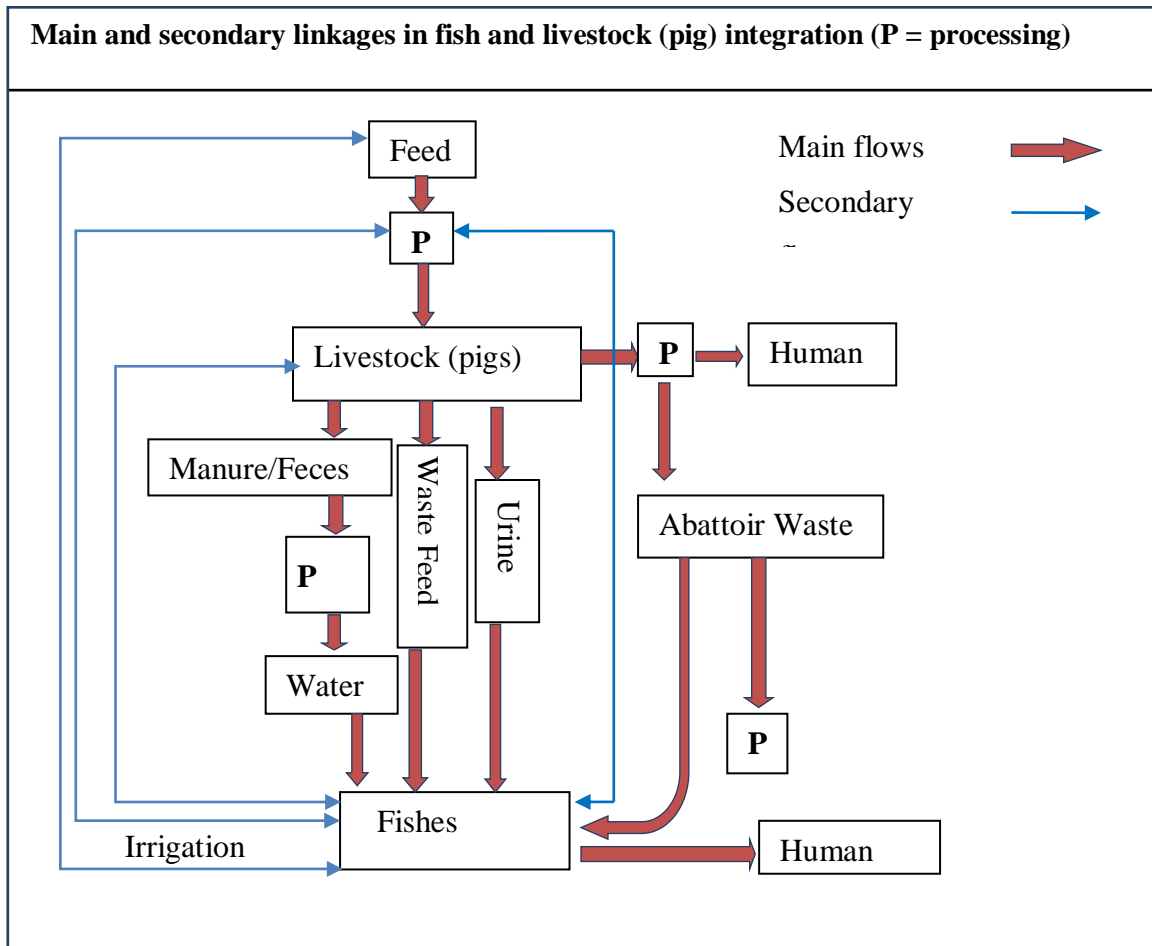
The rationale behind integrated farming is to minimize wastes from the various subsystems on the farm: wastes or by-products from each subsystem are used as inputs to other subsystems to improve the productivity and lower the cost of production of the outputs of the various subsystems (Chandra, 2006).

The important of IFS include pooling and sharing of resources, efficient use of family labor, conservation, and utilization of farm biomass including non-conventional feed and fodder resources, effective use of minimal waste, regulation of soil fertility and health, income and employment generation for many people and increase economic resources. It improves space utilization and provides diversified products. The IFS is part of the strategy to ensure sustainable use of the natural resources for the benefit of present and future generations (Preston & Leng, 1987).

The IFS provide an opportunity to increase economic offarm in per unit area per unit time by asset of intensification of farm and connected enterprises. The Use waste material of one component at the least cost. Thus, reduction of cost of production and form the linkage of utilization of waste material and elimination of middleman interference in most inputsused. Working out net profit ratio is increased. In integrated farming system of theOrganic supplementation through effective utilization of byproducts of linked component is done thus providing an opportunity to sustain the potentiality of production base for much longer periods. Components of varied nature are linked to produce different sources of nutrition. In IFS waste materials are effectively recycled by linking appropriate components, thus minimize environment pollution. The effective recycling of waste material in IFS. Therefore, there is less reliance to outside inputs like fertilizers, agrochemicals, feeds, energy, etc. Due to interaction of farm enterprises with fish and pig, it provides flow of money to the farmer round the year. There is higher net return to land and labor resources of the farming family. Resourceful farmers (bigfarmer) fully utilize technology. Money flow round the year gives an inducement to the small/ original farmers to go for the adoption oftechnologies(Preston & Leng, 1987). And together farm with livestock enterprises would increase the labor requirement significantly and would help in reducing the problems of under employment to a great extent. IFS provide enough scope to employ family labor round the year.IFS provide good scope to use inputs in different component greater efficiency and benefits cost ratio.

3.4 Relationship between Farm Products and People Livelihood

Figure 2: Relationship Between Farm Products and People Livelihood



Source: FAO, 1997

As per the figure above, there is direct link between integrated farming system and livelihood. Among this relationship, there is another embedded relationship within the system i.e. with fish and pig itself. Explaining the process, the first is the foods that are processed and provided to the pigs. The foods thus consumed by the pigs turn into energy and waste material. One of the waste materials i.e. feces of pig is given to the fish as food and urine of the pig is also provided to the fish. Similarly, the remaining junks after feeding pig are also given to fish as their food. The fishes are then either consumed by human or sold for economic benefit. On the contrary, the pigs are also consumed or sold by humans for their profit. In this processing, the pigs during their consumption has to be cut down and the abattoir wastes that are produced are again given to the fishes as food.

Similarly, the water from the fish pond is used for irrigation by people to increase the productivity of their crops. The water from fish ponds are supposed to be full of nutrition as the wastes of fish as well as pig are put into that pond making the water full of nutrients. So, this process; as shown in the above figure depicts that there is inter-linkage between the livestock reared and the economy of the people.

CHAPTER - III

RESEARCH METHODOLOGY

Methodology is an important aspect to conduct any research. This study describes the included research methodology which included research design, selection of the study area, nature and source of data, census method, data collection and techniques, and finalization of analysis and interpretation of data.

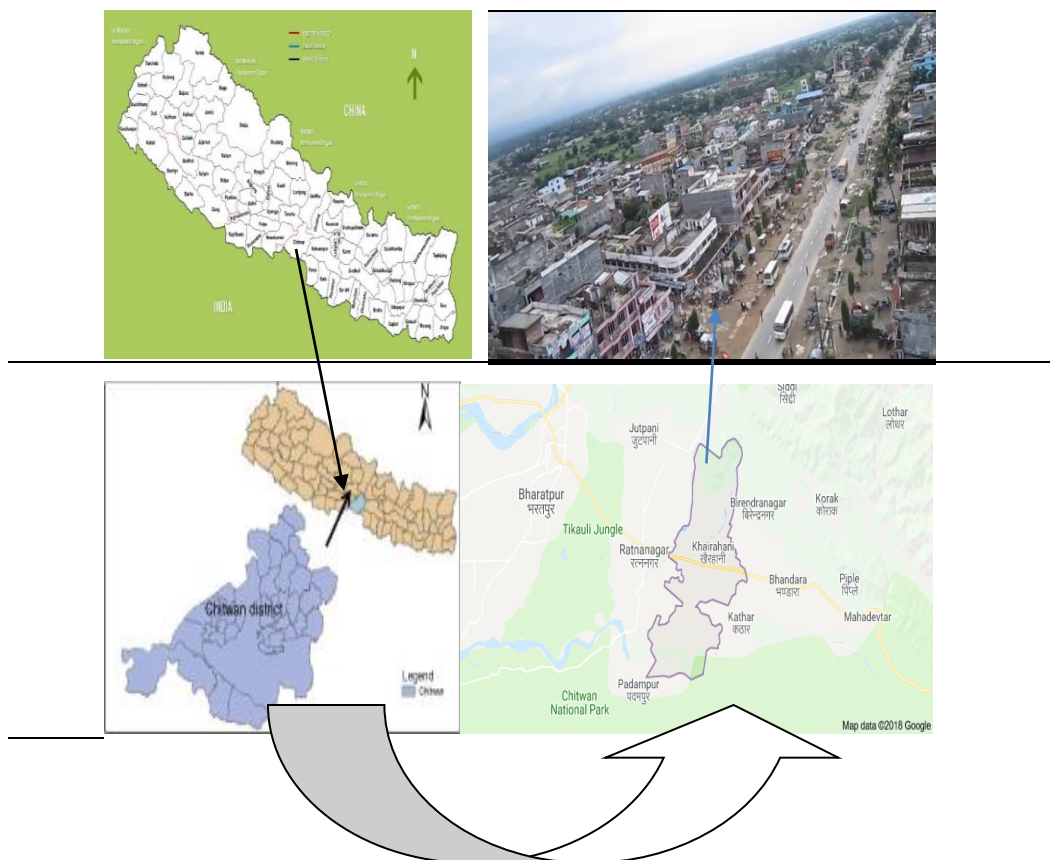
3.1 Research Design

This study aims to represent of the status of livelihood of the prospects of integrated farming system in Khairahani Municipality Chitwan. The study have been based on descriptive and exploratory type of research design which attempt to identify the uses of integrated farming and its impact on livelihood of the farmer. It is descriptive since it attempts to find out the impact of integrated farming system on livelihood in Khairahani municipality of Chitwan.

3.2 Selection of the Study Area

The study area has been selected purposively by the researcher i.e. during the selection of the research area, the researcher has been used to determine the area to conduct the research. Khairahani is a Municipality in Chitwan District in the Narayani of southern Nepal. The Khairahani Municipality consists of 13 wards. Total population of Khairahani Municipality is 56,925. Where male 26,748 and female 30,177 within 5,529 households.

Khairahani is a Municipality which included on Chitwan district in the Narayani zone of southern Nepal. This municipality was established on 08 may 2014 by merging the existing Khairahani, Kumroj and Chainpur VDCs. Study side selection represented below figure:



3.3 Nature and Source of Data

Primary source has been the main source of data. Data includes like: questionnaire survey, photograph collection. And secondary data have been taken from district veterinary office, agriculture office, different journals, CBS data, FAO and Magazines, articles, books, email, internet and various dissertations are used to make the study which is more authentic. The data have been qualitative in nature. But some data have been the mixture of both qualitative as well as quantitative data.

3.4 Census Method

Universe: The Khairahani Municipality & different wards included has been the Universe for the study.

Census method was used for determining the farm for the research. Out of 4 integrated farms present in Khairahani municipality, all the four farms were the census of the research and thus data was collected from all the farms.

3.5 Data Collection Procedure and Techniques

Data Collection Procedure

The researcher essential information have been collected by visiting the study area, interviewing with workers and the farm owners. Others sources of data can be district veterinary office, and agriculture office, NGOs and INGOs working in that area, in the field of integrated farming. Some researcher studied about integrated farming previously, from their research, researcher have been expected to get some data.

Techniques of data collection

In this study, interview schedule have been used for collection of information the structure of interview schedule have been open and close type.

No.	Techniques	Tools
1.	Observation	Observation guideline checklist
2.	Key informant Interview	Interview guideline
3.	Farm survey	Questionnaire
4.	Photography	

3.5.1 Observation

Observation means a technique of data collection where a researcher uses his/her visual perception to identify any kinds of answers and make a research more valid and reliable. Here observation checklist is made as the tools for observation technique.

3.5.2 Key Informant Interview

Key informant interview is conducted to obtain vital information about this farm. The information is typically obtained from a community member (key informant) who is in a position to know the farm, or the particular issue of interest. Researcher may have already conducted a key informant interview in the past without knowing. If researcher have a meeting with Owner of Farm, public official to discuss community needs, researcher have been informally conducted a key informant interview. By conducting key informant

interviews researcher has been good stewards of the valuable time and resources available in this integrated farm.

3.5.3 Survey Questionnaire

The survey questionnaire is a type of data gathering techniques that is utilized to collect, analyze and interpret the different views of farm from total integrated fish and pig farm. The survey questionnaire has been used in the different field such as research, researcher use survey questionnaire to gather information that is beneficial to researcher. So that, Survey questionnaire is a general or comprehensive view of or appraise, as a situation, area of study by the researcher.

3.6 Analysis and Interpretation of Data

The collection of data have been checked, verified editing, coding on the field manually to reduce error then the researcher simple descriptive statistic tools have been used analyze according to tables, and photograph. Then the interpretation have been done.

CHAPTER - IV

DATA PRESENTATION AND INTERPRETATION

This chapter is aimed to display and evaluate the collected data regarding the objectives. The main components of integrated fish and pig farming established for saving the money to use for family and farm purpose and income generation and enhance the living standard of farmers. In this chapter had been analyzed the human, socio-economic status of integrated farming system in study area.

4.1 The Status of Integrated Farming System in Study Area

In this objective to analyze the in human and socio-economic livelihood status after integrated farming in Khairahani Municipality in chitwan district. Collection key information from the farmers and Municipality veterinary and agriculture officers. Following data found:

4.1.1 Types of Animals Farm in Initial Phase

In the first table, the species of farm animals and fishes along with the name of farm-holders as well as the number of species that were present in the initial phase of the farm establishment has been presented in order to determine their initial status.

The below table 1 shows that farm A has started fish farm with 6 different types of fingerlings which are silver carp, common carp, raj born, gouch, big head and raunani. Also farm A has started pig farm with 4 different types of pig which are Hampshire, Seinbel, yogshire and landsel. According to farm B owner, in the starting phase she started fish farm with 4 types of fingerlings which are raj-bom, common- crap, silver-carp and raunani and with 3 types of pigs which are Seinbel, Hampshire and yogshire. As well as farm C also started her fish and pig farm with 5 types of fish and 3 types of pig, which are raunani, raj-bom, silver-carp, big head and common-carp and Hampshire, Seinbel and landsel respectively. Farm D has started farming with different types of fish which are raunani, raj-bom and common-carp and different types of pig which are Hampshire and landsel.

In nutshell, that different farm are started their farming business with same types of fish and pig. Which are Silver-carp, common-carp, raj bom, gouch, big head, raunani and Hampshire,Seinbel, yogshire, landsel respectively. And all the A, B, C and D farms were independent and were solely run by themselves only.

Table 1: Type of Farm Animals

S. N	Name of Farm owners	Farm	Fish	Name of fish	Pig	Name of pig
1.	KeshavBahadurKarma chrya	(A)	6	Silver-carp, common-carp, raj bom, gouch, big head, raunani	4	Hampshire,S einbel, yogshire, landsel
2.	DurgamayaGurung	(B)	4	Raj- bom, common- carp, Silver-carp, Raunani	3	Seinbel, <u>Hampshire</u> , yogshire,
3.	Anita Gurung	(C)	5	Raunani, raj bom, Silver- carp, big head, common-carp,	3	Seinbel, <u>Hampshire</u> , Landsel
4.	GopalBahadurThapaM agar	(D)	3	Raunani, Raj- bom, common- carp	2	<u>Hampshire</u> , landsel

Source: field survey, 2018

4.1.2 Land Holding Size of Farms

Land holding size the socio-economic status of the farm owners in the farm areas. Land holdings size of the farms are shown as:

Table 2: Land Holding Size of Farms

S.N	Farms	Size of land
-----	-------	--------------

1.	A	13 katha, 1 dhur
2.	B	5 katha
3.	C	17 katha
4.	D	3 katha

Source: field survey, 2018

The above table 2 has clearly shown that the area that are covered by farms. According to the table Farm A has spread in 13 katha and 1 dhur, farm B has covered the area of 5 katha in the same way farm C and D has spread in 17 katha and 3 katha respectively.

4.1.3 Investment of Farm in Initial Phase

Table 3: Investment of Farm in Initial Phase

S.N	Farms	Investment of Farm
1.	A	23 lakh
2.	B	12 lakh
3.	C	17 lakh
4.	D	9 lakh

Source: field survey, 2018

The above table 3 has been clearly shown the initial investment of all the farms that was invested by farmers. Here we saw Farmers of farm has invested 23 lakh at initial, farmer of farm B has invested 12 lakh and farmers of farm C and D has invested 17 lakh and 9lakh respectively.

4.1.4 Fishes and Pig Bought in Initial Phase

In the initial investment on fish and pig bought, farm A had bought 5 pigs and 100000 fingerlings in the beginning, farm B had 2 pigs and 40000 fingerlings, C had 4 pigs and 80000 fingerlings and farm D had 6 pigs and 50000 fingerlings.

All the farms had bought fishes and pigs as per their capacity.

4.1.5 Supports from Organization

During the questioning of the supports received from any organization, farm A had received subsidy of rs.400000 from Veterinary office chitwan and 20000 from veterinary department and agriculture department of municipality. Similarly farm B has received 20000 from veterinary department and agriculture department of municipality. Similarly, farm C had received 20000 for shed construction as well as purchasing fishes and also for breed improvement from Veterinary department of municipality. Likely, farm D has received 60000 from district veterinary office.

As per the JTO, Yougeswor Shah of the department of livestock told us, every farmers or firm personnel were provided with training on magh and falgun month and had been giving pig baby (piglet) to group of 20 peoples. Among the subsidy, Rs. 20000 was provided for shed construction, 15000 for buying the feeding material and Rs. 20000 for breed improvement. The farmers and the personnel were provided with vaccination training and temperature maintenance training. The veterinary doctor has been visiting the field in 6 months duration and also as per the requirement. Khairahani municipality has been conducting programs where the farmers are competing with each other where the first get 2500, second get 2000 and third get 1500 respectively and remaining get 1000 for each participant. The farmers didn't have to pay tax after the establishment of the farm where they had to pay 2500 at the beginning as a tax.

As per the agriculture official, the food for the fish was the feces of the pig but they also have managed the food for the fish for the time required at the rate of Rs. 20000 to each farm. They have also been helping them to start e-vector training for the farms as well and has also been motivating the farmers in their activity.

And together, as per the agriculture official Shreekanta Ghimire told us about the food for the fish was the feces of the pig but they also have managed the food for the fish for the time required at the rate of Rs. 20000 to each farm. They have also been helping them to start e-vector training for the farms as well and has also been motivating the farmers in their activity.

In a conclusion, researcher has found that all the farms had received some grants from municipality, veterinary office and district level office as per the size of the firm.

4.1.6 Acquisition of Training

While evaluating the trainings that were acquired by the farm and the farm personal, following trainings were found;

Farm A: Shed construction training, temperature maintenance training, treatment and vaccination training and butchery training, water sterilization and purification training for ponds

Farm B: Shed Construction training, temperature maintenance training, treatment and vaccination training, water sterilization and purification training for ponds

Farm C: Shed Construction training, temperature maintenance training, treatment and vaccination training, water sterilization and purification training for ponds.

Farm D: Shed Construction training, temperature maintenance training, treatment and vaccination training, water sterilization and purification training for ponds

As a conclusion, the farm personnel had enough training for sustainably running the farm.

4.1.7 Most Supportive Family Member in Integrated Farms

While the question on the most supportive family member was raised, Farm A owner told us about his son, who devoted his time more on the farm than other members of the family. Similarly, the owner of farm B has reported that her husband gives his more time on the farm than other members of the family and supports her the most. Similarly in farm C, husband has been supporting the farm and the owner most. Lastly, the farm D owner claims that his wife supports him in his farm activities most.

Looking at the scenario, husband has been supporting most in the farm management where women are the owner of the farm.

4.1.8 Health Care Treatment of Livestock

During this while studying about the integrated fish and pig farm, the firm A should be keep for the pig's medicine on the every month, but to the requirement of the vaccination should be placed on the 2/2 month, and has the compulsory vaccination medicine needed to treatment made during pig delivery was obtained. But farm B, C and D has been flow the treatments and vaccination process as well as farm A.

4.1.9 Consumers of Farms Products

Evaluating the consumer of the farm products, farm A, B and D reported that the local people and the local business persons were the major consumers of the farm products. Farm C has reported that the local people, local businessman and some market outside of that municipality were the major consumers.

The local people and the local businessperson were the prime focus in the utilization and consumption of the farm product.

4.1.10 Purpose of Produced Product

In the process of collecting data of integrated fish and pig farming in Khairahani municipality, where collected data found from four farms. Farm A has mentioned that they have earned adequate income by selling their products in local market and community. Along with selling in market, they also consume the products themselves. Likewise, farm B also focused in selling their products in local market and local people, farm C also sells their products in local market. In near future they have been planning to take their business to next step i.e. in national market. And farm D has been using in self-consumption and also has been selling their products to local market as well. They also had the commitment on enlargement of their farm if required in time.

In conclusion, the farms are helping more to the local market rather than national level market.

4.1.11 Use of Pig Feces and Urine

In the study of the use of pig faces and urine, farm A used substantial amount of waste materials are utilized as food for the fish and some extra waste is utilized in producing bio-gas. Farm B and D on the other hand used the waste in agriculture and for feeding the fishes. Farm C used the waste for food of fish as well as selling in the local community.

Thus, in the conclusion, the waste products of pig are used mostly for feeding fish and some remaining waste are used in agriculture and bio-gas production.

4.1.12 Condition of Produced Goods in the Market

During the analysis of the condition of produced goods in the market, firm A, B, C and D had satisfactory condition in which the demand for their product in the market was growing in the sense that their product was sold in mere days of production.

4.1.13 Problem and Challenges of Integrated Fish and Pig Farms

In the response for the challenge and problem of integrated fish and pig farm, farm A didn't have any kinds of problems. Similarly, farm B had human resource problem and economic problem. In terms of challenge, the farm B was facing the challenge of flooding i.e. flood affects the fish ponds. Farm C on the other hand had economic problem and as a challenge the community didn't support them in their activity. Lastly farm D had no any kinds of problems. In a nutshell, there is no problem and challenges received by farms A but D and farm B and C had been facing the challenges and problems and are still moving forward.

But also from the observation farm A: In the observation of the farm, they had their own fresh house to sell the products in the market. The farm condition of that farm as well as the water condition was also fine. There was good temperature maintenance system in the farm. Similarly, there was proper waste management system where the feces of pig was used as food to the fishes. Similarly, there was water softening methodology used by the peoples to secure the fish farming. There was additional multi-water use system where the overflown water was used in agriculture. They had irrigation system and proper waste management system.

Farm B, C and D didn't have own fresh house to sell the products in the market, farm condition, household condition and human health condition was normal. All the farms had high voltage bulb to ensure temperature maintenance. Farm B had problem of soil erosion but others were safe from erosion. In all the farms, fertilizers and waste products were used in fish pond. The road access to the farms was a bit tougher as they were far from the main road.

As a conclusion, the observation on the farms were normal with average level of enthusiasm on maintenance and upkeep of the farms.

4.1.14 Marketing Problem of Integrated Fish and Pig Farm Product

Looking at the marketing problems, government policies are not favoring their farm business as per farm A, farm B had the problem of storage, policy of the market and lastly government policy. Farm C on the other hand, had the problem of collection and storage. Lastly farm D had the same problems as farm B.

In a conclusion, the farms had been facing marketing problems due to government policy and also storage facility.

4.1.15 Methods to Ensure Safety of the Farm Product from any Risk

Farm A has been using high voltage bulb to ensure heat maintenance for pig and use of limestone powder to break the hardness of water for fish pond. Similarly, for farm B, C and D, they didn't have preventive measures to ensure the safety of the fish and pigs.

Finally, only one farm was cautious of the preventive measures of the fish and pigs.

4.1.16 Role of Male and Female in Farm Management

In farm A, all the activities of the farm were handled by male of the farm, farm B have all the activities done by female and only some works as waste management by male of that farm. In farm C, financial side and waste management was handled by the women and other rest by male and finally farm management was by the male and other cleaning, bathing and economic activity was handled by female.

Thus, the activity of the farm was participatory in nature i.e. the participation of both male and female in the management of the farm as per the requirement.

4.1.17 Marketing Channel

During the time of studying the integrated Fish and Pig farming, what researcher found was, the product of good's sales and distribution of farm A owner by the intermediary and local people. Similarly, farm B doesn't do the same as farm A but they do directly by the intermediary and those intermediaries have the special profit. And in farm C, because of its huge capacity of product local people, intermediate, distributor channel along with them they themselves sale and distribute the farm product. Furthermore, farm D has sold and distributed their product themselves and sometime by the help of local people.

In conclusion, affirmation Fish and pig farm's product distribution task has been focused by local peoples and sometimes beyond the municipality level.

4.1.18 Time Spend in Farm

Through the study of this farm the researcher found how much the farmer spend the time. In which in farm A the owner has spent his full time. Likewise, farm B has utilized six and half hour out of 24 hours. Similarly, farm C also has been spending almost all the time in the farm. In farm D the owner has spent his time equally to home as well as farm because the farm was near the home.

To summarize, all the farm in Khairahani municipality have helped and improved their livelihood, that's why, they spent their whole time in their farm.

4.1.19 Working Outside of Farm

The researcher found these owners have been working out of the farm as well. The owner of the farm A, earlier had worked in own shop. Later he sold it and increased investment in the Fish and Pic farm. And now, extracting some time from farm activity, he has been working in rice mill and his son has been working as a helper in Fresh house. Similarly, the owner of the farm B has worked only in household works and for caring and sanitation of the farm. Likewise, owner of Farm C works same as the owner of the farm

B. Farm D owner, as a retired British Army, invested all amount in his farm and does not work in other areas.

In nutshell, both owner of the farm tries their best to develop the employment opportunity to other people in the farm and control the migration of the local people. They want to stand as an epitome of a self-reliance farmer though it is as a small work.

4.1.20 Major Farm Products People have been Used

All the different four Farms, in farm A has been using the paddy (chawol), maize, wheat and in pulses rajma (kidney bean), matahar and in vegetable potato, kauli, gopi, gajar (carrot) as well as mula. Farm B, C and D also has been using farm products people same as well farm A.

4.2 Impact of Integrated Farming System on livelihood

In this objective included to find out the impact of integrated farming system on livelihood in Khairahani Municipality, Chitwan. Following data are found which are as:

4.2.1 Annual Income Status

Table 4: Annual Income Status of Farmers

Farms	Established (in year)	Year 070/71	Year 071/72	Year 072/73	Year 073/74	Year 074/75
		Income	Income	Income	Income	Income
Farm A	070/71	1 lakh	5 lakh	8 lakh	10/11 lakh	16 lakh
Farm B	2070	2 lakh	3 lakh	Nearly 3.5 lakh	5 lakh	7 lakh
Farm C	2072	----	----	3 lakh	7 lakh	12 lakh
Farm D	2071	----	2 lakh	3 lakh	4 lakh	6 lakh

Source: field survey, 2018

The above mentioned table 4 has shown the annual income of farm A, B, C and D. where farm A was established in 2070/71 years, which has only estimated 2 lakhs in the year, and in the years the income is grown long enough, in 2071/72, 2072/73, 2073/74, 2074/75 years, 5 lakhs, 8 lakhs, 10/11 lakhs, and 16 lakhs respectively. The establishment was farm B in the year 2070. The income of farm on year 2070/71, 2071/72, 2072/73, 2073/74, 2074/75 is 1 lakh, 3 lakh, 3.5 lakhs, 5 lakhs, and 7 lakhs respectively. For C established in 2072, there was 3 lakhs, 7 lakhs, 12 lakhs annually in the rank 2072/73, 2073/74, 2074/75, and Farm D, in the same manner 2072/73, 2073/74, and 2074 /75, it has reached 3 lakh, 4 lakh and 6 lakhs respectively.

In the conclusion, all the firms has been received the income in initial established year gradually slowly but in last few years became increase income. In all the integrated fish and pig farm are income became increase but from the all farm, farm C was the able to the increase income then other A, B and D farm.

4.2.2 Annual Saving Status

Table 5: Annual Saving Status of Farmers

Farms	Established (in year)	Year 070/71	Year 071/72	Year 072/73	Year 073/74	Year 074/75
		Saving	Saving	Saving	Saving	Saving
Farm A	070/71	Not saving	3 lakh	4 lakh	6 lakh	8 lakh
Farm B	2070	Not saving	1 lakh	2 lakh	2 lakh	4 lakh
Farm C	2072	----	-----	Not saving	4 lakh	7 lakh
Farm D	2071	----	Nearly 1 lakh	1 lakh	Nearly 1.5 lakh	4 lakh

Source: field survey, 2018

The above table 5 has shown the annual saving of different four Farms. Mentioned table has been shows the annual income of farm A, B, C and D. where farm A was established in 2070/71 years, which has not saving in initial year and then in next years the income is grown long enough, in 2072/73, 2073/74, 2074/75 year, 3 lakh, 4 lakh, 6 lakh, and 8 lakhs respectively. The farm B was established in the year 2070, on 2070/71 Farm B also can't have saving income as similar to farm A. and then next year the saving gradually increase from the 1 lakh, 2 lakh, 2lakh and 4 lakh in following year 2071/72, 2072/73, 2073/74, 2074/75 respectively. Likewise farm C was established in 2072 where farm c doesn't have save in initial phase and then next year gradually increase the saving rate where in 2073/44, 2074/75 respectively 4 lakh, and 7 lakhs. And in farm D annual income 2071/72, 2072/73, 2073/74 and last 2074/75 respectively nearly 1 lakh, 1 lakh, nearly 1.5 lakh and 4 lakh.

In the conclusion, all the firms has been cannot besaving income in initial year. But in last few years became increase saving. In all the integrated fish and pig farm are became increase saving but from the all farm, farm C was the able to the increase saving income than other farm A, B and D.

4.2.3 Effects Seen in Socio-economic Status

After the use of integrated farming system, farm A has helped in environment balance by waste management (using the waste foods for feeding fishes and pigs), created

employment opportunities which has increased the economic status of the people involved in the farms (job holders as well as the owners) and has been providing home for a family and occupation for them as well which has helped them to improve their livelihood. Similarly, farm B, C and D has been helping in waste management as well as providing employment opportunity to the local people.

These kinds of integrated farm helps in creating employment opportunities to the locals as well as helps in waste management and increase per capita income as well.

4.2.4 Use of Saved Income

With the saving from the income, A uses the saved income for household purpose as well as farm upgrading, B uses the saved income for farm upgrading and for education of the children, C uses the saved income for household purpose and developing the farm and farm D uses the saving for increasing the size of the farm as well as for social works in the society.

Thus, we found out that the farms have been saving some amount of income for different purposes.

4.2.5 Created of Types of Employment Opportunities

This question has been used to identify the types of employment opportunity (monthly, yearly, seasonally etc.) created. As per the owner of farm A and B, monthly employment is provided to the local people, as per farm C, there is both part time as well as full time for yearlong and farm D has been providing employment opportunity as per the season. Moreover, all the farms have been providing employment opportunities to the local people rather than outsiders.

In a nutshell, the farms have been creating employment opportunity as per the need of the farm.

CHAPTER - V

SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Summary

A brief summary of the research results along with the salient findings is presented in this chapter. Also based on the conclusions drawn from this study, policy options are suggested for planners and administrators. The present study was undertaken in Khairahani Municipality on Chitwan district, with a general objective assess the impact of integrated farming system on livelihood.

The specific objectives of the study are:

- To assess the status of integrated farming system in study area.
- To find out the impact of integrated farming system on livelihood in Khairahani Municipality.

The study used descriptive research design. The design was appropriate as it allowed for gathering of information concerning the current human and socio-economic status of the farmer and describes it as it exists. Census method was used to get respondents who had integrated fish and pig farm which has been improvement their livelihood and as well as change their life style. Data was collected on the human and socio-economic status, the underlying reasons for factor that integrated fish and pig farm on Khairahani municipality in Chitwan district. And the tables was used to analyze the data.

5.2 Findings

The followings were the findings:

- Integrated fish and pig farming in Khairahani Municipalities on Chitwan, which all are farm has been operationalized by the ethnicity. And where both male and female are equal active in the integrated fish and pig farming.

- These integrated farms of Khairahani municipality has been providing employment opportunity to the local people as well as uplifting their status who are worker in the farm.
- Among the farms, farm A had maintained strongest social status and standard in the society.
- The farms are helping more to the local market rather than national level market.
- The Fish and pig farm's product distribution task has been focused by local peoples and sometimes beyond the municipality level.
- In this all farm Khairahani municipality have helped and improved their livelihood, that's why, they spent their whole time in their farm.
- Farm owner has been tries to their best to develop the employment opportunity to other people in the farm and control the migration of the local people. They want to stand as an epitome of a self-reliance farmer though it is as a small work.
- All the farms are Silver-carp, common-carp, raj bom, gouch, big head, raunani and Hampshire,Seinbel, yogshire, landsel respectively.
- Looking at the scenario, husband has been supporting most in the farm management where women are the owner of the farm.
- The local people and the local businessperson were the prime focus in the utilization and consumption of the farm product.
- The farm personnel had enough training for sustainably running the farm.
- Kinds of integrated farm helps in creating employment opportunities to the locals as well as helps in waste management and increase per capita income as well. The farms has been creating employment opportunity as per the need of the farm.
- The waste products of pig are used mostly for byproduct of fish and some remaining waste are used in agriculture and bio-gas production.
- All the farms had been saving from their income to some extent.
- Researcher found out that the farms has been saving some amount of income for different farm, household and other purposes.
- Researcher has found that all the farms had received some grants from municipality, veterinary office and district level office as per the size of the firm.

- All the farms were independent and were solely run by themselves only.
- All the farms had bought fishes and pigs as per their capacity.
- The farms had been facing marketing problems due to government policy and also storage facility.
- Only one farm was cautious of the preventive measures of the fish and pigs.
- The activity of the farm was participatory in nature i.e. the participation of both male and female in the management of the farm as per the requirement.
- The agriculture official, the food for the fish was the feces of the pig but they also have managed the food for the fish for the time required at the rate of Rs. 20000 to each farm. They have also been helping them to start e-vector training for the farms as well and has also been motivating the farmers in their activity.
- In Khairahani municipality has been conducting programs where the farmers are competing with each other where the first get 2500, second get 2000 and third get 1500 respectively and remaining get 1000 for each participant. The farmers didn't have to pay tax after the establishment of the farm where they had to pay 2500 at the beginning as a tax as a size of farm.

5.3 Conclusion

A brief conclusion of the above discussed chapters is an attempt to be made in this chapter. The main objective of the research is clearly to study of integrated fish and pig farming system on livelihood in Khairahani Municipality of Chitwan district. And focusing on the impact of integrated farming system on livelihood. Hence the following conclusion are generated as:

The study provided an innovative idea about the integrated farm in the study area. The integrated farming systems play a vital role in for the farmers and add value to agricultural waste and livestock excreta as well as human excreta. This integrated fish and pig farm significant advantages, especially in regard to the human and socio-economic. The maximum use of feceswaste of pig was for the byproduct of fish purpose also where over flow of waste used in bio-gas which for energy were found to be enjoying the lighting facility.

Local people were the main beneficiaries of the farm product and amount of time was saved through marketing for the like buying goods and services, bring the food for livestock, washing and bathing so on. The local people were basically getting opportunity to involve in farm to generate employment, generate of daily income and to help in generate the fulfilments of daily basic needs.

Hence, in order to support the activities of maintenance farmers affecting to food security and sustainable resources management, it is important for farmer's human, and socio-economic network that would enhance food security, resource management and their livelihood, as a whole.

5.4 Recommendations

The study showed the need for further research into the eradication of problems for the cultivation of integrated farms on Khairahani Municipality in chitwan district follows are recommendation:

- There is a need for further livestock training regarding the vaccination and treatment supported by farm animals.
- Diversification of integrated farming systems also need greater emphasis on livestock, as they are land saving and stabilize the income and increase the employment opportunities on the one side, and reduce the risk of lower returns on the other.
- The integrated farming system concept has to be strengthened and expanded across different holding sizes to enable farmers to capture with interactions. This needs farm management extension effort.
- Integrated farming system is an extension programs need to be developed with market extension towards system efficiency.
- Training should be given to suggest the technical way of byproduct matters to get the maximum output from the limited available resources.
- Maintenance training to all the integrated fish and pig farm owners should be given compulsorily so that they do not have to depend on veterinary office and agriculture office for the days to maintain and repair of the farm.

- There are all integrated fish and pig farmers compulsory maintain the storage fresh house.
- The government should formulate some terms and conditions against integrated farmer so that, integrated farmer can get more subsidies.

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ANNEX- I
Questionnaires for Data Collection
Farm’s survey questionnaire
Khairahani municipality, Chitwan

A. Personal Detail of Respondents

1. Name of respondent.....2. Age.....3. Language.....S
 4. Occupation.....6. Sex.....7. Ward No.....
 7. What is your Education level? (Tick and Write)
 a) Class of schooling. B) SLC c) Campus.....Level
 d) Literate e) Illiterate

B. Demographic Information

1.	Name of Household head
2.	Sex of household head	Male..... 1 Female..... 2 Third gender..... 3
3.	Caste of household	Brahmin1 Chhetri.....2 Vaishya.....3 Sudra.....4 Ethnicity.....5 Others.....6
4.	Occupation of household	Service.....1 Agriculture.....2 Business.....3 Labor.....4 thers.....5

6.	No. of family member
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C. Socio- Economic/ Occupation income source information

1. Which land have you occupied for farming?

Types	Khet	Bari	Pakho
Amount (Kattha)			

E. Who was ownership of fixed property by men and women?

	Khet	Bari	Pakho	House	Others
Male					
Female					

3. How much your annual income is?

- a) Less than 1 lakh
- b) 1 lakh – 5 lakh
- c) 5 lakh – 10 lakh
- d. above 10 lakhs

4. Which type of farm have you obtained?

5. What are the impact has been shown in t' mmunity? After establishing the farm by you.

- a. Change life style
- b. reduced dependency
- c. Change in thinking capacity of the people
- d. Create employment opportunities
- e) Way of self-dependent
- f) increase purchasing capacity

6. What are the assets have you obtained after farming?

- a) Human, political
- b) Financial, social

C) Natural, physical

D) Human and socio-economic

7. Which purposes for have you produced your products?

a) Self-consume

b) sell to local market

c) sell to national market

8. Which marketing channel is your product sold?

a) Self

b) local people

c) Mediator

d) Distribution channel

9. How many animals are there in your farm?

a) Pigs..... c) Fish.....

10. How much time do you spend to care the farm?

a) Hours.....

b) Minutes.....

11. Have you work out of home along with farm? Where...

12. How this farm important for your livelihood?

13. Who is most supportive in your family for this farm?

14. How does you are satisfied with your farm?

15. Who is the consumer of your farm product?

a) Local people

↳ Local business man

c) Out of municipality people

16. Do you have any suggestions to others about farm, what it would be?

.....

17. Which type of training have you takes related to your farm?

a).....

b)

18. How has the affected in the socio-economic side after establishing this firm?
19. Which kinds of employment opportunities create by this farm?
 A) Seasonal b) Monthly c) Daily
20. Which sector does the animal's Feces / urine used?
 A) used in agriculture sector b) buying C) byproduct of fish
21. Which area should be giving employment opportunities?
 A) Local b) National c) International
22. Which types of animal's health care do you have?
23. How often does take health care?
 A) 1-3 months b) 3-6 months c) 6-9 months d) 9 months above
24. What is the condition of goods produced in the market?
 A) Good b) Bad c) Satisfactory
25. How much savings are there to arrange for almost a yearly?
 A) 0-1 lakh b) 1-5 lakh c) 5-10 lakh d) Above 10 lakhs
26. What are the reasons for saving income?
 A) Family purpose b) For firm c) for invest
27. Which you afraid to support a NGOs/INGOs when setting up your firm?
28. How many peoples are investing in this firm?
29. How often does produce of the farm product?
 A) In 1-3 months, b) 3-6 months c) 6 months in d) Above9 months
30. What are the problems and challenges have you faced during established your farm?

i) Shed construction and improvement

ii) Feed purchases

iii) Breed improvement

1. What is generally adopted immunization/vaccination schedule?
2. What are environment control methods adopted in pig and fish farm?
3. If there is any prize designated for best farm owner?
4. What and which facility provide for the integrated farmer from veterinary office and agriculture office included about fish in details?
5. What and which facility provide for the integrated farmer from veterinary office and agriculture office included about pig in details?

ANNEX- III
Observation Checklist

Particular	Status/Process
Storage	
Farm condition	
Household condition	
Temperature	
Soil erosion	
Fertilizer	
Water condition	
Human health condition	
Pesticides	
Waste product management	
Accessibility	
Irrigation	

