

ROLE OF FARM WOMEN IN VALUE ADDITION TO FARM PRODUCE

Thesis

**Submitted to the Punjab Agricultural University
in partial fulfillment of the requirements
for the degree of**

**MASTER OF SCIENCE
in
FAMILY RESOURCE MANAGEMENT
(Minor Subject: Sociology)**

By

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CERTIFICATE – I

This is to certify that the thesis entitled “**Role of farm women in value addition to farm produce**” submitted for the degree of **M.Sc.** in the subject of **Family Resource Management** (Minor subject: **Sociology**) of the Punjab Agricultural University, Ludhiana, is a bonafide research work carried out by **Divya Martolia (L-2016-H.Sc-326-M)** under my supervision and that no part of this thesis has been submitted for any other degree.

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

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ABSTRACT

The study entitled “Role of farm women in value addition to farm produce” was undertaken to study the existing status of value addition to farm produce in selected households. The study was conducted to determine the role of farm women in value addition to farm produce and to identify the constraints faced by farm women. A self- structured interview schedule was designed to conduct a survey on farm women in rural area of Ludhiana district. For sample selection two blocks from Ludhiana district were randomly selected. Further from each selected block two villages were randomly selected, from each selected village 30 respondents were randomly selected thus making the sample size 120. Results of the study revealed that the existing status of value addition to various farm produce of farm families were reported low, only farm women who were part of women oriented SHG(self help group)were involved in value addition process to farm produce products such as flour, pickle, squash or juice making. Further no value addition in allied farm produce was found in dairy, poultry and bee-keeping as well at secondary and tertiary stage, whereas, few respondents were involved in value addition process in fruits, dairy and honey. The role of farm women in value addition categorized as independently, jointly with other members or no participation. Majority of the farm women were reported no participation at primary stage except in dairy and bee-keeping farm families who had dairy animals and bee boxes participated independently and jointly with other members, whereas, value addition at secondary and tertiary stage mostly performed by farm women who were member of SHG (self help group) only and no value addition was observed in allied farm produce at secondary and tertiary stage. The constraints faced by farm women in value addition to various farm produce was lack of time management due to women involvement in domestic chores, lack of self-confidence, lack of training assistance to farm women, unwillingness to practice value addition because of poor health issue and lack of high cost equipment.

Keywords: Value addition, Farm women, Farm produce, Self help group, Constraints.

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ਸਾਰ

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CONTENTS

| CHAPTER | TITLE | PAGE NO. |
|----------------|------------------------|-----------------|
| I | INTRODUCTION | 1 – 5 |
| II | REVIEW OF LITERATURE | 6 – 16 |
| III | MATERIALS AND METHODS | 17 – 21 |
| IV | RESULTS AND DISCUSSION | 22 – 47 |
| V | SUMMARY | 48 – 52 |
| | REFERENCES | 53 – 56 |
| | ANNEXURE | i – vi |
| | VITA | |

LIST OF TABLES

| Table No. | Title of table | Page No. |
|------------------|---|-----------------|
| 4.1 | Distribution of respondents on the basis of their socio-personal and economic characteristics | 23 |
| 4.2 | Distribution of respondents according to the crop cultivation pattern adopted by their families | 28 |
| 4.3 | Distribution of respondents according to the fruits cultivation pattern adopted by their families | 30 |
| 4.4 | Distribution of respondents according to the vegetables cultivation pattern adopted by their families | 32 |
| 4.5 | Distribution of respondents according to the number of dairy animals owned by their families | 34 |
| 4.6 | Distribution of respondents according to the bee-keeping farming owned by their families | 35 |
| 4.7 | Distribution of the respondents according to their participation in value addition to farm produce at primary stage | 38-39 |
| 4.8 | Distribution of the respondents according to their participation in value addition to farm produce at secondary stage | 41-42 |
| 4.9 | Distribution of the respondents according to their participation in value addition to farm produce at tertiary stage | 44-45 |
| 4.10 | Identification of the constraints faced by farm women | 46 |

LIST OF FIGURES

| Fig No. | Title | Page No. |
|----------------|---|-----------------|
| 4.1 | Distribution of respondents by age group (years) | 24 |
| 4.2 | Distribution of respondents by education qualification | 24 |
| 4.3 | Distribution of respondents by marital status | 24 |
| 4.4 | Distribution of respondents by family type | 25 |
| 4.5 | Distribution of respondents by family size | 25 |
| 4.6 | Distribution of respondents by family annual income (in lakh) | 25 |
| 4.7 | Distribution of respondents by operational landholding | 26 |

CHAPTER I

INTRODUCTION

In Indian society, rural women have multi dimensional role ranging from agricultural and allied activities to domestic activities. The jobs traditionally done by farm women in the order of importance are mainly the kitchen gardening, harvesting, seedling raising and transplanting. Moreover, Indian rural women share substantial responsibilities and perform a wide spectrum of duties in most of the family related activities, farming related activities as well, besides their exclusive involvement in domestic chores. In other words, rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not defined as “economically active employment” in national accounts but they are essential to the wellbeing of rural households.

The desirable socio-economic development can be achieved only when women in large are stimulated and motivated to accept and adopt new techniques which lead them to play a major role to play in the development process. The Economic Survey has proposed an agricultural policy aimed at integrating women as active agents in rural transformation. (Sally 2018). For the last few years, programmes for women have been receiving particular attention under community and rural development programmes, which undermines the potential benefits from programme, especially those related to food production, household income improvements, nutrition, literacy, poverty alleviation and population control. Equitable access for rural women to educational facilities had certainly improved their performance and liberates them from their marginalized status in the society. Although women play an indispensable role in farming and in improving the quality of life in rural areas, their contributions often remain concealed due to social barriers and gender biasness existing in our society where women are still largely self-employed or employed as casual labour in agriculture (Shrivastava and Shrivastava 2010).

Value addition to farm produce has made significant contribution to agriculture sector of India. The concept of value addition in agriculture, in the developing economies is widely becoming an acceptable strategy adopted by both government and non-governmental organizations towards improving the income generation of the rural communities. The farmer trend in which rural farmers disposed-off their farms produce without processing seems to be drastically reduced through such transactions.

Value-added agriculture entails changing a raw farm produce into something new through various methods of preservation of food including thermal processing, fermentation, pickling, dehydration, freezing etc. The technology for preservation also varies with type of products and targeted market. Adding value to agricultural products is a worthwhile endeavor because of the higher returns that come with the investment, the opportunity to open new markets and extend the producer's marketing season as well as the ability to create new recognition for the farm (Matthewson 2007). Value addition to farm produce has assumed vital in our country due to diversity in socio-economic conditions, industrial growth, urbanization and globalization.

India is among top 5 producers in worldwide of rice, wheat, groundnut, spices, oilseeds etc but still holds less contribution in value addition to farm produce, as it contributes less than 1.5 per cent of processed food in international food trade (Singh *et al* 2012). This implies that there is a vast scope for investment in agro processing for better value addition and direct income generation. Currently in India, value addition to raw materials at different stages includes primary processing which includes cleaning, grading, powdering and refining of agricultural produce, whereas, secondary process includes basic value addition, e.g., tomato-puree, ground coffee, processing of meat products and tertiary processing includes addition products like jams, sauces, biscuits and other bakery products ready for consumption. 75 per cent are involves in primary processing, whereas, secondary and tertiary processing together accounts only 25 per cent (Saikumar *et al* 2010).

A remarkable feature of any economy is that depends on agriculture and contributes national income to some extent for boosting the country like India. Agriculture is an important economic sector and offers plenty of employment opportunities. According to the latest India's census (Census 2011) more than 60 per cent of the work force in the country depends on agriculture.

The value adding processes range from simple preservation to production of high value products. For example, a farmer cultivates paddy on his farm and the paddy plants produce paddy, straw, husk, bran, and rice kernel. Paddy has a potential of supporting a number of processing industries such as rice mills, solvent extraction plant for rice bran oil, processing of husk for variety of products and straw paper or board mills and the processing of these raw materials opens up large value addition possibilities.

The processing of farm produce often goes simultaneously with agricultural diversification as perishable products like meat, milk, poultry, fruits and vegetables, often termed as High Value Products (HVPs), are in greater demand of processing. Faced with the current economic realities, farmers worldwide are searching for new options of surviving, as

well as expanding their agriculture business. The empowerment of women through self-help groups (SHGs), a non formal cooperative organization would benefit not only the individual women but also the family and community as a whole through collective action for development (Holvoet 2005).

Empowering women needs a holistic approach to participate in decision making in the household, community and local domestic sector and prepare women to take up leadership position in agricultural activities. SHGs in rural India are bringing a silent revolution not only in terms of providing access to micro credit to communities but also in contributing towards a greater sustainability in agriculture in various ways, including a better use of marginalized local agro biodiversity.

Rural women always play an important role in the society, the rural women are often physically visible but conceptually invisible and remained marginalized. The best way to make optional use of human resources is to provide them opportunities for self-development through training, which improves the existing knowledge and skill, enhances capability, and improves the competency to meet the challenges of the society and technology (Meera *et al* 2001). The involvement of women has increase in horticultural sector with the increase in area and production of these crops. The women are playing major role in cultivation of fruits, vegetable and flowers (Baba *et al* 2010)

Livestock is one of the important sectors in agriculture. It accounts 52.2 percent of agriculture value added and 11 percent of GDP (GOP 2008). Poultry production at home level particularly assigned to women, which contributes a lot for family nutrition and subsequently for family health. Beekeeping is often promoted in the context of rural development because the practice provides monetary, nutritional, and social benefits to poor families, without requiring land ownership or large amounts of capital investment (Wolff and Gomes 2015)

The economic returns from farming are diminishing due to various factors. Hence, it has become imperative to resort to some practices which may help to make the farming more remunerative. Adding value to farm produce is one of the most measures to enhance profits from agriculture. Mechanization is an essential input not only for crop production, but it also has a crucial role to play along the entire value chain. By mechanizing the whole process of agricultural crop value addition from planting to marketing, higher value outputs can be produced, rural employment can be created and sustained, post-harvest losses can be reduced, quality can be enhanced and smallholders can be integrated into the market economy.

Governments can support the development and coordination of value chains. Investments that incentivize greater productivity and the ability to capture a higher value include transport infrastructure; energy for processing, chilling, drying, or and packaging

commodities; research and extension services in new storage, processing and packaging technologies; and education and training in product marketing. Perhaps the most critical role of governments is establishing systems of laws, regulation and governance, which set rules for fair and competitive markets for farmers, marketing agents and processors and permit farmers to secure land and property rights.

Women's involvement is much more significant than is widely known or acknowledged. In fact, the role of women in contributing to food security is often not appreciated. However, for greater achievement in food security support should be provided to rural women who are closely associated to food production systems

The Ministry of Food Processing Industries has launched a new Central Sector Scheme PRADHAN MANTRI KISAN SAMPADA YOJANA (PMKSY) with an allocation of Rs.6000 crore for the period of 2016-20 co-terminus with 14th Finance Commission cycle. PMKSY is an umbrella scheme for overall development of food processing sector which includes development of food processing units. The scheme encompasses three new schemes viz.

- (i) Infrastructure for Agro-processing Clusters;
- (ii) Creation of Backward and Forward Linkages; and
- (iii) Creation/Expansion of Food Processing & Preservation Capacities and four on-going schemes viz.
 - a) Mega Food Parks;
 - b) Integrated Cold Chain and Value Addition Infrastructure;
 - c) Food Safety and Quality Assurance Infrastructure; and
 - d) Human Resources and Institutions.

The aforementioned schemes are implemented mainly by private sector & demand driven and provide flexibility to the promoters to choose the components, their capacities and location of the project as per techno economic feasibility conducted by them and ensuring the viability of the project vis-à-vis availability of adequate infrastructure and smooth backward and forward integration.

The major objectives of PMKSY are to create robust modern infrastructure along the entire food processing value chain, reduce wastage of agricultural produce and increase food processing/value addition which would, inter alia, increase the income of the farmers and encourage them to adopt better farming methods/practices to increase farm productivity.

As Government is giving tremendous input for food processing so that the wastage of farm produce can be reduced and income generation activities could be elevated. Keeping the

above concept in the view, the research is designed to study role of farm women in value addition to farm produce. Thus, it become imperative to know women contribution in value addition to farm produce as women is pivotal part of national economy.

1.1 Objectives

- 1.1.1 To study the existing status of value addition to farm produce in selected households.
- 1.1.2 To determine the role of farm women in value addition to farm produce.
- 1.1.3 To study the constraints faced by farm women in value addition to farm produce.

CHAPTER II

REVIEW OF LITERATURE

This chapter endeavors to deal with the review of literature to provide a gainful insight into the work done in the research fields. The function of citing review of literature is to provide a base for developing framework, providing an insight into methodology, selection of sample, operational definitions of concepts and finally to work out a basis for interpretation of findings and discussion of results.

Women have a crucial role to play in post harvest technology particularly in areas related to winnowing and storage of grains. However, little attention has been paid to food losses. It was suggested that proper handling and management needs to be taught systematically to rural women. A study of needs of training in PHT (Post Harvest Technologies) for farm women was launched which covered the involvement of women in operations, the effectiveness of the messages on PHT transmitted in terms of knowledge gain and associated factors influencing knowledge acquisition and attitudinal change. The results revealed that the message of PHT can be transmitted effectively without any consideration for age, caste, education or family type, implying that need based training can overcome the barriers of personal factors or limitations. PHT is, therefore, relevant to farm women irrespective of their personal profile variables (Verma *et al* 1992).

Danielson and Park (2001) from his study concluded that value added activities can provide a supplement to farm's other agricultural enterprises. The addition of value can result from the application of the farmer's own time, management, skills, and resources to make products with less capital expenditures and purchased inputs, as well as from the sale of products of higher intrinsic value for consumers who are willing to pay more for quality.

A study conducted by Supekar (2002) stated that to enable women to undertake the agricultural or other income-generating programs and specific need based training courses are to be prepared and conducted. These training programs shall include interalia cropping management patterns, agro-processing and preservation, marketing, packaging, advertisement for entrepreneurship development, seed collection and selection, nursery activities, forestry, appropriate low-cost technology, organic farming etc. In short, in addition to adult literacy among women the "Agriculture Literacy" program has to be undertaken as a special campaign. The results further indicated that value addition technologies targeting women should be relevant, accessible and affordable. Similarly, women entrepreneurs should be facilitated to acquire credit, appropriate training in value addition and marketing skills.

To identify and analyse different methods being used by the women in cassava processing, a study was carried out by Okorji *et al* (2003) in Nigeria, sample size 150 women

cassava processors were taken to perform the study and three cassava processing methods were identified namely modern, traditional and a hybridized trado-modern. It was discovered that using trado-modern and modern methods in cassava tuber processing were more efficient in terms of output, labour input and costs than traditional method. However, there existed no modern technology that can kick start and complete cassava tuber processing into any of the six products (gari, akpu, akaraakpu, tapioca, starch and flour) without relying on the traditional method. It was recommended that the engineers should construct low cost processing equipment that will reduce both the time on each operation and the tedious nature of cassava processing.

Post training evaluation of 300 women from various self-help groups in Bangalore on the technology of incorporating dehydrated greens (*Celosia argentea*) powder into ready-to-eat products (chakli, laddu and savoury biscuits) prepared with a combination of maize and cowpea for value addition and income generation was done by Nath *et al* (2005). Results revealed that overall perception of the women regarding technology for the preparation of dehydrated greens powder and the value-added ready to eat snacks is viable, effective, and helpful in generating employment and empowering women. Feedback of the programme showed that hundred percent of the participants expressed their willingness to prepare them at home. Sixty per cent expressed that these products could be marketed. Ten percent of the participants have taken up these products for self-enterprise. These trainings would go a long way in improving economic and nutrition security of rural women folk.

Ashfaq *et al* (2008) conducted a study to quantify the share of women in household's farm income and productivity of wheat crop in Faisalabad district. The results revealed that females working hours were significant variables that contributed towards the productivity of wheat and also had positive impact on the overall income of the farm households. Thus women in the study area clearly had significant effect on the farm productivity and ultimately on the farm income.

Effective post-harvest treatments play a key role in increasing productivity and combating food shortages due to decay. The role of postharvest protection in the food chain is often underestimated. Innovative and safe solutions are vital to protect healthy fruits and vegetables in view of the ever-increasing demand for these important food commodities all year round. Modern crop protection solutions based on innovative active ingredients from Bayer crop science's portfolio make an important contribution to food quality and thus toward ensuring healthy, nutrition and safeguarding the food supply (Shahabuddin 2013).

Wanga *et al* (2009) carried out a study which aims to analyze the constraints in selling high quality value added milk products, faced by women owning milk micro

enterprise in Kenya. The findings showed that women in milk micro enterprises used basic value addition technologies that were operated at low costs but which at the same time hindered their performance in the milk business, which showed majority of the women processed fresh milk (99.1%) and fermented milk (88%), all of which do not require highly sophisticated processing equipment. Some (36.1%) made yoghurt while only a few processed ice-cream (3.7%), *ghee* (0.9%) and butter, which require sophisticated processing equipment. A major factor that hindered women entrepreneurs from upgrading milk value addition equipment was lack of finance. 92.9 per cent reported that they could not acquire the desired value addition equipment because they were too expensive. They also had problems accessing appropriate value addition information due to lack of knowledge on sources of information (50%), lack of time to look for the information (28.3%) and the high cost of acquiring the information (13.0%). Almost half (48.7%) of the women also experienced problems in marketing their products. The main problem was inability to profitably price products, which was 33.3 per cent. The results further indicated that value addition technologies targeting women should be relevant, accessible and affordable. Similarly, women entrepreneurs should be facilitated to acquire credit, appropriate training in value addition and marketing skills.

A study was conducted by Amin *et al* (2009) on participation level of rural women regarding post-harvesting activities in Pakistan. It was reported that most of the activities related to take the crop to the market and mills were performed by the husbands (67.97%) with limited participation in food preservation and processing whereas, the wives were mainly involved in cleaning of store rooms, storage of agricultural products in bags and preparation of marmalades and pickles. The findings revealed that participation of women was very high in storage, drying, packaging of grains and low in marketing.

Singh and Datta (2010) examined that Indian dairy sector has shown tremendous growth in terms of milk production, from 17 million tones (1950-51) to 112 million tonnes (2009-10). This transition from deficiency to sufficiency has been achieved by a series of policy interventions by the government. The first phase of 'Operation Flood', growth rate of value-added products was 0.93 per cent per annum, but in the third phase, it became 9.10 per cent per annum. Milk processing in India was around 35 per cent, of which the organized dairy industry accounts for only 13 per cent of the milk produced, the remaining 22 per cent is processed in the unorganized sector. It has highlighted certain dairy development policies to encourage growth of the dairy sector. While value addition in milk is unavoidable if one has to enhance sector profitability, the same does not seem feasible unless the organized sector improves its penetration.

The study was conducted in the purposively selected Jalandhar district of Punjab by Kumar *et al* (2010) on value addition of potatoes and chillies and for this a sample of 75

potato and 75 chilli growers were selected. Data were collected by interviewing the respondents. The results revealed that about 83.00 per cent of the potato growers were aware about sorting whereas 98.67 per cent of them were aware about grading of potatoes. All the respondents were aware that pickles and sauce are the processed products of chilli and about 67.00 per cent of the respondents agreed that there is lack of equipment and one fourth of the respondents agreed that there is lack of storage infrastructure. All the potato growers also agreed that value addition adds to profit of farmers and it's the need of the day. Maximum number of respondents of both categories (chilli and potato growers) reported lack of technical knowledge non availability of equipment and their high cost, non availability of credit, high cost of starting of processing unit and lack of good storage facilities as the major reason for not opting for value addition.

Empowerment of women farmers through value addition on minor millets genetic resources: a case study in Karnataka conducted by Vijaylakshmi *et al* (2010). The objectives were to understand the social and economic empowerment of the women members of SHG's (Self Help Group), and to empower the women through interventions in training and value addition. The results concluded that capacity building interventions, the skills, self confidence and leadership enhanced through the training courses played an important role in boosting the income generating activities pursued by their women members.

To analysed economic and technological constraints faced by women in farm activities, a study was conducted by Tiwari (2010) in four villages of Uttar Pradesh with the sample size of 100 farmwomen drawn by proportionate random sampling. The study concluded that women faced number of economical and technological constraints such as costly agricultural inputs, irregular and costly supply of electricity, non availability of subsidy, non availability of necessary inputs at the right time or in the right quantities and viable and compatible technology for farm women etc.

A research study was conducted by Berem *et al* (2011) to determine the adoption of honey value addition and contribution of value addition to household poverty among 110 randomly selected honey producers in Baringo County. The study uses Heckman two stage and the logistic regression models to determine the adoption of value addition contingent on the decision of a honey producer to participate in value addition activity, and to assess the link between honey value addition and household poverty status, respectively. The results showed the farmers with small quantities of honey were less likely to engage in value addition as they saw it as loss and it was reported as a major constraint to value addition, who harvested little amounts indicating that they could not participate in value addition majorly because they viewed it as a waste of time and finances. Adding value to honey this decision is positively

and significantly influenced by the amount of honey harvested, group membership and amount of hours spent on off-farm activities, while it is negatively influenced by the age of the farmers and the education level of the household head. Value addition contributes to the reduction of poverty through the improvement of household incomes.

Shivaraja (2012) conducted the study in Karnataka with the sample size of 120 farmers for production and for this six dry chilli processing units were selected randomly. Both primary and secondary data were collected and analysed by employing compound growth rate analysis, tabular presentation technique, budgeting technique and financial feasibility analysis. The results revealed that area under chilli in Haveri district was showing a decreasing trend over the years. The total cost of cultivation of chilli per hectare was worked out to be Rs.39343.92. The net return per hectare obtained by farmers was Rs. 19589.86. The pattern of capital investment in dry chilli processing units revealed a direct relationship with size of the processing units. Total cost per quintal of dry chilli processed was more in large units (Rs.7095.23/q) as compared to medium (Rs.7034.27/q) and small (Rs.7021.64/q). The net return per quintal of dry chilli processed was higher in case of large (Rs. 1829.77/q) units compared to medium (Rs.1785.73/q) and small (Rs. 1693.36/q). The charge of transportation including loading and unloading and gunny bags accounted major share in per quintal of dry chilli marketing costs incurred by the sample respondents. The farmers suggested that uneven rainfall and non availability of labours at the right time were the severe problems and high government taxes, price of raw material and scarcity of labour were the major problems faced by processors in dry chilli processing.

Ali (2012) conducted study on 556 vegetable growers in eight districts of Uttar Pradesh as vegetable growers suffer greatly from the problem of high post-harvest losses, resulting in significant declines in food quality and safety, competitiveness in the market, and profits earned by producers. This study analyzed the adoption behavior of vegetable growers for postharvest practices of washing, sorting and grading, preserving and cooling, dehydrating/drying, packaging, and labeling and storage for value addition. The Poisson count regression model was used to identify the most likely factors affecting adoption of postharvest practices in the vegetable value chain. The results indicated that diversified vegetable farmers, inclined to introduce new crops, use credit, have higher income, employ better irrigation facilities, adopt integrated pest management techniques, and sell produce in organized markets, were more likely to adopt postharvest techniques.

Aggarwal *et al* (2013) conducted a study to analyse the problems faced by women in performing agricultural activities. Data was collected from a sample of 150 farm women in the age group of 20 – 45 years with the help of interview schedule, field observation and case

studies techniques. The results of the study highlighted that majority of the women suffered from minor health problems, management problems, social and financial problems. Specifically almost all the women (95.3%) suffered from health problems such as back ache, headache and fatigue while 80 per cent of the women feel that their diet was not balanced and healthy. Majority of the women (60.6%, 71.3%, 53.3% & 64.6%) reported unhygienic conditions on the field, found difficulty in managing the time between farm and home, faced difficulties in carrying out major agricultural operations like crop harvesting, transplanting, sowing etc. and shyness from male member while working on fields as a major problem. Only 32 per cent of them were not comfortable working along with their in-laws on the agricultural fields. Maximum number of women i.e. between 70-76 per cent faced financial problems on account of both lack of resources and lack of finances.

A research was conducted by Said and Pradhan (2013) on preservation and value addition of jaggery. The IISR (Indian Institute of Sugarcane Research) Lucknow had developed various processing equipments (pan) and standardized the manufacturing process for hygienic preparation of jaggery. Preservation can be enhanced by incorporating different natural preservatives. The value addition of jaggery has tremendous scope as there was lack of past work on value addition. The value addition improves the nutritional value of the jaggery by adding various vitamins, minerals which are not present or in fewer amounts. Many of the scientists have developed new processing technologies, equipment for production of jaggery, different storage methods for preservation of jaggery, and the value added products to enrich the jaggery.

A study was carried out by Varma and Devi (2013) who worked on various constraints faced by the farm women in utilizing the technical information regarding different cereals and oil crops in six districts of Haryana with sample size of 485 rural women. The findings revealed that among all the constraints rice growers, in Karnal and Kurukshetra districts, faced lack of technical expertise, physical and time constraints and in Jind and Kaithal districts, physical and time constraints were perceived most serious constraints by the wheat grower. Most serious constraints such as physical, social and language were faced by the cotton growers.

Parveen *et al* (2014) Conducted the study on minimize the post harvest loss by practicing value addition in Pakistan. In spite of high yield, agriculture sector suffers significantly from postharvest losses of about 30–40%, because inherently this sector are more liable to deteriorative nature of fresh fruit and vegetables under tropical conditions characterized by high ambient temperatures and humidity, and a high incidence of pests and diseases which diminishes returns for producers. Tremendous opportunities exist for vertical

diversification within the fruit and vegetable sector in terms of increase in farm income, poverty alleviation, food security, and sustainable agriculture. The vibrant agro-food industry have unlimited potential in the form of processed or value added products and consumers all over the country can get opportunity to enjoy them throughout the year. In this transaction, processing of food crops into a variety of products with extended shelf life. Adding value to the original crop also helps the farmer not only to overcome the spoilage and losses, but also fetches high returns due to the newly added technology. Value addition enterprises are aimed at giving value to the raw commodities into multiple products like fruit candies, jam, jellies, marmalade, fruit nectars, juices, dehydrated products and semi-processed food etc. which we can envisage in this category as well as remunerative prices to farmers. It provides convenience & safe food to consumers and promotes diversification and commercialization of agriculture by providing effective linkage between consumers and farmers. Moreover, it will make farm produce more exportable. The need for technology generation and commercialization at small scale are of critical importance to growth and diversification. The development of a dynamic agro-food industry will depend on innovative research and the deliberate engagement of the national inventive system comprising academia, industry, and government sector.

Salome (2014) carried out a research on role of women in agricultural activities in Nigeria. Information obtained from 150 women through interview scheduled on socio-economic characteristics, agricultural activities, agricultural production and their constraints. The agriculture activities revealed that 94 per cent of the respondents were involved in processing, 90 per cent in harvesting and 86 per cent in marketing of farm produce, whereas, 80 per cent of the respondents planted pineapple, 60 per cent planted orange, while 40 per cent planted palm fruit and pepper, and about 50 per cent planted cassava and groundnut. The socio-economic characteristics revealed that women produce crops for family consumption and generate income within their locality and half of the respondents' belonged to age group of 41-60 years. Majority (80%) of them do not have access to land, 60 per cent of them were married while 40 per cent had primary education. The constraints faced by women included mainly finance, lack of land for farming, poor transportation network, lack of farm input, inaccessibility to modern production technology, poor and weak farmers groups and co-operative unions.

Mgbakor *et al* (2014) conducted the study to identify socioeconomic situation, factors that affect value addition in the area, the major constraints to value added production and processing and the level of technology available to the respondents in Nigeria. Self structured interview schedule was used to collect the data. The major findings were large quantity of rice

production and profitability. The major constraints are lack of adequate training, funds, appropriate technology. From the data collected and due analysis, it was concluded that there was a poor state of value chain exhaustion following lack of adequate technology, technical know-how, government incentive and training. High cost and drudgery equally constitute significant constraints to rice business.

A study was carried out by Oduol and Mithöfer (2014) who worked on constraints to and opportunities for women's participation in high value agricultural commodity value chains in Kenya. The study focused on two categories of women namely those in male and female -headed households. The data were collected through focus group discussions, key informant interviews and household surveys. The results showed that women dominate the production stage while men tend to own the fields, make decisions on sales of fruits of premium quality and control revenues. Women in female headed households appear to be fully integrated in most of the stages of the export value chain, although they face greater challenges than men in performing tasks that are physically demanding like harvesting and those that require specialized skills such as grading and spraying. Women in male headed households in the export market will require involving them in the trainings on certification standards.

Omoare *et al* (2014) examined the awareness of value addition of sweet potato has received comparatively little attention in Nigeria despite its potential to reduce perishability and enhanced utilization of the crop in diverse products forms. Multi-stage random sampling technique was used to select 120 respondents for the study. Data obtained were analyzed using descriptive statistics and multiple regression analysis. The findings showed that level of sweet potato value addition was very low, it can be concluded that awareness of value addition of sweet potato was very low and consequently had lesser economic returns per hectare.

To study the extent of participation of farm women in vegetable Cultivation, a research was conducted by Manjari (2014) in Guntur district of Andhra Pradesh. The findings revealed that majority of the respondents (60-90%) were involved in almost all the activities of vegetable cultivation either independently or jointly with male members of the family however, their participation was found to be less in activities like seed selection, irrigation, procurement of inputs and plant protection.

Islam *et al* (2015) conducted the study on Livelihood promotion through value addition to household traditional *Sal* (*Shorea robusta* Gaertn.) leaf plate making in Jharkhand. The sample villages were selected using random sampling technique and all the households owning cottage industries of *Sal* leaf plate making were selected as representative respondents

for household survey employing purposive sampling technique. The data on production, seasonality, employment generation, income earning and marketing were collected through personal structured interviews and direct observations. Value addition by mechanized pressing of raw *Sal* leaf plates may increase income by Rs. 24100/ household/ year (96.40 %) and employment by 50 mandays/ household/ year (12.50 %). It was recommended that crucial intervention can accelerate forest resources based livelihood diversifications, promotion and development.

A study was carried out by Khatun *et al* (2016) on value chain analysis of processed poultry products (egg and meat) among 123 respondents from each Districts (Dhaka and Chittagong) was selected. A random survey was performed with the help of constructed and pretested questionnaire. The results showed that Value chain analysis was the profit and cost effectiveness analysis of an enterprise. Profit was the difference between the total value of the products and total cost of performing the activities i.e., from production down to consumers as producer value chain; marketing value chain and consumers value chain.

Dahiya and Mehta (2016) conducted a research study on empowerment of rural women through value addition of fruits and vegetables in Fatehabad district of Haryana as the work was part of Rashtriya Krishi Vikas Yojna Project. Twenty five farm women from each village were selected. The main objective was involvement of farm women in fruit and vegetable growing and post harvest operations and feasible value added fruit and vegetable products. The results was found highest for simplicity, complexity (mean score 4.50 rank I) followed by relative advantage mean score 4.32, triability mean score 3.78 observability mean score 3.0 respectively. Half of the respondents acquired medium level of skill regarding fruit and vegetable processing.

The study was carried out at (Pakistan Council of Scientific and Industrial Research) PCSIR Laboratories Skardu. Fruits apple, mulberry, apricot, seabuckthorn and commercial grade preservatives Potassium metabisulphite and Sodium benzoate used. The findings of this study showed that the developed products of apple and apricot mixed squash, jam, and candy is of good quality and has maximum consumer acceptance. The jam and candy/leather developed from apricot alone has less consumer acceptance as compared to apricot apple mixed developed jam and candy. The shelf life study up to 90 days storage study showed apricot apple and other fruit can be utilized and preserved in the form of squash, jam and candy. So that the farmers of Gilgit-Baltistan can get maximum benefits from fruits and can control the losses and wastages of fruits by using these wounded, fallen and diseased infected fruits for product development. Khan *et al* (2016)

A study was carried out with the aim to analyse the mushroom value chain and its contribution to the actors' income. Sample size of 84 actors in the North West Region of Cameroon was analysed with descriptive statistics and added value calculation. The findings showed that 65.48 per cent of the respondents were farmers, 13.09 per cent were transformers meanwhile 21.43 per cent were retailers. Results also revealed that various actors are involved in the production and commercialization of fresh mushroom, dried mushroom, mushroom juice and mushroom powder. Analysis showed that the short value chain was most profitable. Also, farmers make an average net margin of 36 per cent for the production of fresh mushroom; transformers make the least profit margin (0.42%) meanwhile retailers make an average net margin of 5.6 per cent. Based on the actors' perceptions, mushroom production and commercialization offers many opportunities such as; creating employment, increasing income and ameliorating health. The constraints faced by them such as intrusion of pest, high seed prices, lack of finances for expansion, competition with pickled mushroom and insufficient production equipment Egwu *et al* (2016).

A research study was conducted by Chandra *et al* (2017) on value addition of underutilised fruits with a conceptual model for women empowerment by analysis of the secondary data. Enterprise Architecture (EA) Analysis was used to portray the concept i.e., a small business venture based on value addition of underutilized fruits for SHGs to women empowerment. The findings showed that most of the minor fruits are enriched with nutritional and medicinal value and can be grown even in wastelands without much care. Therefore, it is worthwhile to look into the organized cultivation and improvement of minor group of crops like aonla, pumpkin, wood apple, bael etc. so that their utilization can be maximized. These underutilised fruit crops are seasonal in nature if completely dependent on them can cause input constraint. Hence research organizations must concentrate on these crops to develop production even during off seasons.

A study was conducted on 100 randomly selected rural women in Udaipur district of Rajasthan by Hada and Bansal (2017) with the objective to identify the participation of rural women in processing and preservation of fruits. The findings of the study revealed that respondents had poor participation in fruit processing and preservation practices. The outcome of the study divulged that majority of the respondents (100%) were participating in practice of fruit selection independently or jointly with male members. However, in other activities like washing, grading, processing & preservation, packaging, storage and marketing participation of women was found to be less.

Khatri (2017) conducted the study to analyse technological needs of farm women in post-harvest practices of kinnow, in Sri Ganganagar district of Rajasthan. The findings

revealed that respondents had poor knowledge and adoption in post-harvest practices of kinnow with over all mean per cent score of 28.69 and 28.80. The overall gap in knowledge and adoption of post-harvest practices was found high. Wide knowledge gap was existed in storage (78.5%), grading (65%) and packaging (59.08%). Similarly high adoption gap was observed in the components viz-waxing (100%), processing (100%) and transportation (91%).

A study was undertaken with the objective of identifying determinants of milk value addition by 238 dairy farm households in Ethiopia by Tadesse (2017). The results indicated that age, education level of household head, number of children under age of six, access to labour force and extended shelf life were found to be determinant of participation in milk value addition. The finding implies that paying special attention for aged households will have positive effect on participation decision and expanding rural education as well as arranging mechanism for experience sharing among experienced and younger farmers.

A study was carried out by Islam *et al* (2018) on participation of rural women in activities related to homestead vegetable cultivation at Monirampur upazila under Jessore district. The findings revealed that highest proportion of the rural women had low to medium participation in homestead vegetable cultivation. The respondents' participation was highest in seedbed preparation and raising of seedlings while it was least in intercultural operation. In case of 26-issues under 6- aspects of homestead vegetable cultivation, the high dominant area of participation by the respondents were seed collection. The least dominant area of participation was training. Only age showed a significant relationship with their participation in homestead vegetable cultivation. This showed that participation of women in homestead vegetable production was still unsatisfactory and necessary steps concerning extension approach should be taken to increase the vegetable production by ensuring barrier free participation of rural women in homestead vegetable cultivation.

Critical appraisal of review

It can be concluded from the foregoing review that there are several studies related to value addition performed by SHG (Self Help Group) women in particular farm produce but there is limited studies, which investigate the role of farm women in value addition to farm produce who were not a part of any SHG. It was felt important to study the farm families' women involvement in value addition practices. The present study entitled "Role of farm women in value addition to farm produce" was undertaken to study the existing status of value addition in selected households and to determine role of farm women in value addition to farm produce and the constraints faced by farm women in value addition.

CHAPTER-III

MATERIAL AND METHODS

Systematic methodology is a base, for a successful research. As it adds to clarity and precision of the findings related to the research problem. The present study on “Role of farm women in value addition to farm produce” was undertaken to study the existing status of value addition in rural farm household. A systematic procedure was followed to complete the study in different phases:

- 3.1 Locale of the study
- 3.2 Sample selection
- 3.3 Instrument used
- 3.4 Pretesting of the instruments
- 3.5 Collection of data
- 3.6 Statistical analysis of data

3.1 LOCALE OF THE STUDY

The study was conducted in four villages of two different blocks of Ludhiana district of the Punjab state. There are twelve blocks in Ludhiana district. Out of these, two blocks were randomly selected further from selected block two villages from each block was randomly selected. Village Ayali Kalan, Thareeke was selected from Ludhiana –I block, village Ayali Khurd, Balloke was selected from Ludhiana-II block randomly.

The following table gives the list of villages and number of respondents selected from each village.

| Name of the blocks | Name of the villages | Number of respondents |
|--------------------|----------------------|-----------------------|
| Ludhiana block I | Ayali Kalan | 30 farm women |
| | Thareeke | 30 farm women |
| Ludhiana block II | Ayali Khurd | 30 farm women |
| | Balloke | 30 farm women |
| Total | | 120 |

3.2 SAMPLE SELECTION

A sample of 120 farm women of four different villages of two different blocks of Ludhiana district comprising 30 respondents from each village was randomly selected. A list of farm families in the selected villages was prepared with the help of village “Sarpanch” where the woman participating in agricultural and allied activities was prepared

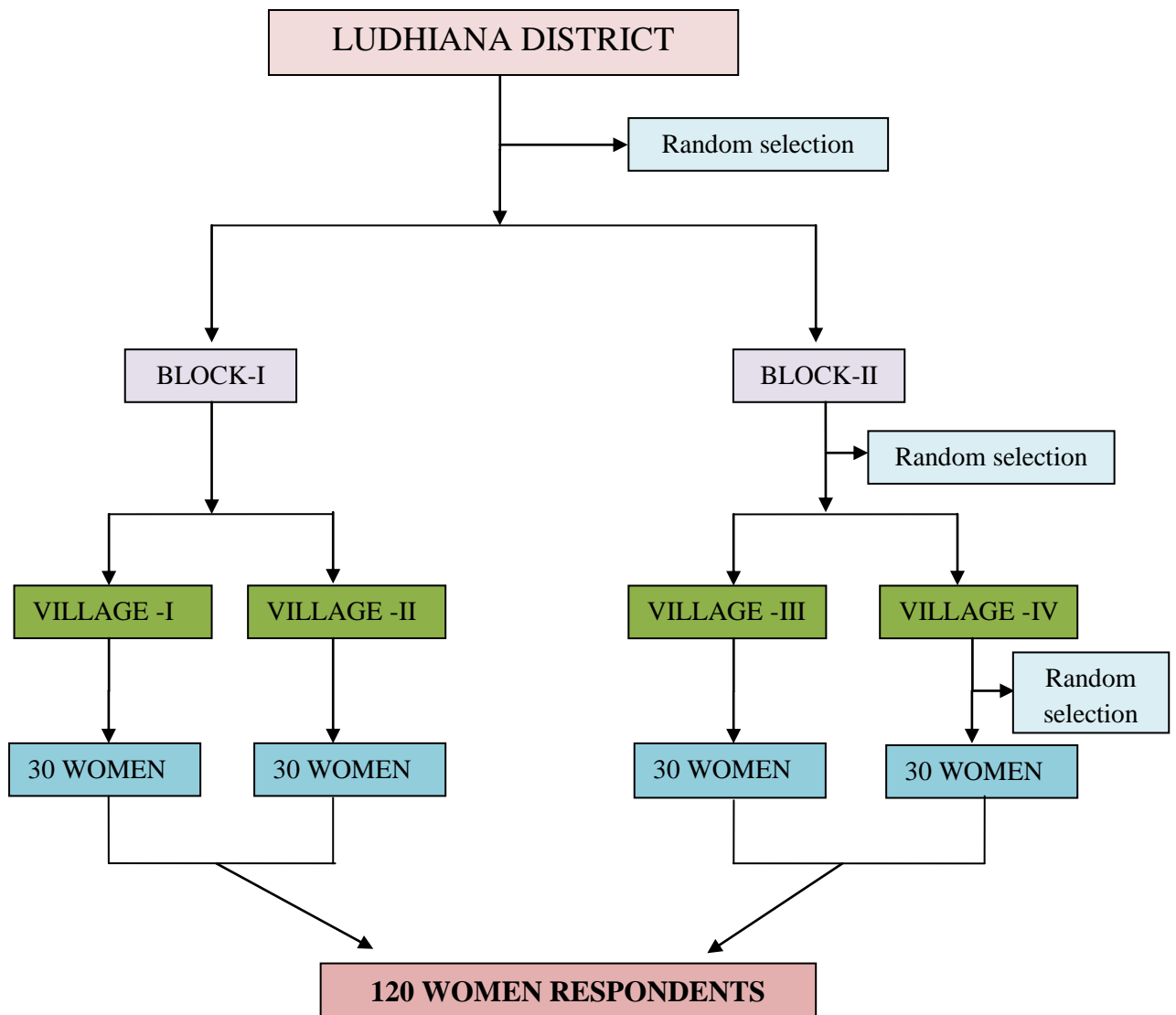


Fig. 1: Selection of Sample

3.3 INSTRUMENT USED

For collecting the relevant data, a self-structured interview schedule was prepared which comprised of following parts:

3.3.1 General information: The first part of the survey focused on collecting the basic information of the respondents like age, education, marital status, income, type and size of family.

3.3.2 Specific information: Specific information was collected on following sub points.

3.3.2.1 Existing status of value addition to farm produce in selected households.

Existing status of value addition to farm produce was addressed through a structured interview schedule. Information was gathered about produce of major crops and of allied agricultural vocations in selected households and the extent of value addition to farm produces through primary, secondary and tertiary processing was studied by framing appropriate questions.

3.3.2.2 Determination of the role of farm women in value addition to farm produce

This part contained items related to role of farm women in value addition to various types of farm produce viz. cereals, pulses, oilseeds, vegetables, fruits, milk, poultry and honey and their role in value addition to farm produce through various modes viz. participation in different stages of value addition (primary, secondary and tertiary) was determined by asking relevant self-structured questions.

3.3.2.3 Identification of constraints faced by farm women in value addition to farm produce

Various possible constraints were listed under the category of technical, personal, infrastructural and miscellaneous.

Technical constraints comprised of lack of technical knowledge regarding value addition, lack of accessibility to handle technological tool and lack of marketing. Personal constraints included low self confidence, lack of family support and motivation, poor health, shyness from male trainer and unwillingness to practice value addition. An infrastructural constraint consists of lack of cold chain and storage facilities, poor transportation, poor supply of resources (water/ electricity) and lack of equipment. Miscellaneous included lack of time management, lack of training opportunity, lack of contact with extension agents and less demands of value added products.

3.4 PRE- TESTING OF THE INSTRUMENTS

Before collecting the primary data, the self structured interview schedule was put into trial run on 15 rural farm women from a non- sampling area of Ludhiana district were

randomly selected to pre-test the self structured interview schedule for the validity of the questionnaire whether the questions are really match with objective of the researcher's study or not. A few changes were made in the order of questions. The pre-test helped to finalized the schedule with certain modifications in constructing and arranging the order of questions and presenting the appropriate questionnaire and table.

3.5 COLLECTION OF DATA

The self-structured interview schedule was used to collect the data. The respondents were approached in their respective household. In the first step investigator approached the sarpanch of the selected villages. From each village a required number of respondents were randomly selected. The respondents thus selected from the selected villages constituted the final sample of 120.

3.6 STATISTICAL ANALYSIS OF DATA

According to the objectives appropriate tables were formulated depending on the kind of information required. Various statistical tools applied were: frequencies, percentage and mean score.

3.6.1 Frequency and percentage

Frequency and percentage were calculated to find out distribution of the respondents according to socio- personal characteristics, involvement of respondents in value addition to farm produce. The frequency distribution of respondents was worked out and expressed in terms of percentages.

$$\text{Percentage} = \frac{\text{Frequency}}{\text{Total respondents}} \times 100$$

3.6.2 Mean score

It was obtained by adding the score and dividing their total by number of observations. The mean score calculated by using the following formula:

$$\bar{X} = \frac{\sum X}{n}$$

Where

X = mean score

$\sum X$ = Sum of all observation score

n = Total no. of respondents

Operational Definitions

Value addition: value addition is the process of transforming a product from its original state to more valuable state. Many raw commodities have intrinsic value in their original state

as well. For example, field corn grown, harvested and stored on a farm. There are three stages in value addition; primary stage, secondary stage, tertiary stage.

Primary stage: In primary stage conversion of raw food materials to foods that can be eaten or to ingredients that are used to make edible food products. The activity in this stage includes cleaning, sorting, drying, picking, milking etc.

Secondary stage: In secondary stage conversion of raw ingredients, i.e. the products of primary stage, to edible food products.

Tertiary stage: In tertiary stage, food stuffs prepared to sold and consume as shelf stable products, refrigerated or frozen products.

Farm women: Farm women are those who work on farm of her husband owned or on rented land for generating indirect income for her family.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents the analysis and interpretation of the data collected for the present study, "Role of farm women in value addition to farm produce". Systematic research technique was applied and gathered information has been explained under the following sections:

- 4.1 Distribution of respondents according to their socio-personal profile
- 4.2 Assessment of existing status of value addition to farm produce
- 4.3 Determination of the role of farm women in value addition
- 4.4 Identification of the constraints faced by farm women

4.1 Distribution of respondents on the basis of their socio-personal and economic characteristics

The socio-personal and economic characteristics of respondents like age, education, marital status family type, family size, family annual income and land holding of the respondents have been presented in Table 4.1 and are as under:-

Age: The data in the Table 4.1 and fig. 4.1 reveals that 42.50 per cent of the respondents were in age group of 33-42 years followed by 40.83 per cent respondents were in the age group 24-33 years and 16.66 per cent of the respondents in higher age group of 42-50 years.

Education: Regarding educational status, more than half of the respondents (58.33%) had high secondary education followed by one fourth of the respondents (25.83%) were graduated, 10.83 per cent of the respondents had matric level of education and 5.00 per cent of the respondents were found to be primary passed.

Marital status: Data in Table 4.1 and fig. 4.3 reveals that majority of the respondents (96.66%) were married whereas, 3.33 per cent of the respondents were found to be divorcee/ widow.

Family type: Only 9.16 per cent of the respondents belonged to joint family, whereas, majority of the respondents (90.83%) had nuclear family. This shows the decreasing trends of joint families in rural area. The findings was concurrent with the statistics of census 2011 which shows that there are only 23.99 per cent joint families existing in state of Punjab (Anonymous 2013).

Family size: The trend of nuclear families was further revealed in form of family size with majority (54.16%) having less than 5 members in their families. Whereas, 37.50 per cent respondents had 5-10 members in their families and very less percentage (8.33%) of the respondents had more than 10 members in their families. Findings were found concurrent with the statistics of census 2011 which shows that majority of the households in Punjab had family size of 4-5 members (Anonymous 2013).

Table 4.1: Distribution of respondents on the basis of their socio-personal and economic characteristics

N=120

| Socio-personal and economic characteristics | Category/range | f (%) |
|--|-----------------------|----------------|
| Age (years) | 24-33 | 49 (40.83) |
| | 33-42 | 51 (42.50) |
| | 42-50 | 20 (16.66) |
| Education | Primary | 6 (5.00) |
| | Matric | 13 (10.83) |
| | High secondary | 70 (58.33) |
| | Graduate | 31 (25.83) |
| Marital status | Married | 116 (96.66) |
| | Divorcee/Widow | 4 (3.33) |
| Family type | Nuclear | 109 (90.83) |
| | Joint | 11 (9.16) |
| Family size | Less than 5 | 65 (54.16) |
| | 5-10 | 45 (37.50) |
| | More than 10 | 10 (8.33) |
| Family Annual income (in lakh) | Less than 3 lakh | 101 (84.16) |
| | 3-5 lakh | 16 (13.33) |
| | More than 5 lakh | 3 (2.50) |
| Operational land holding (acre) | 1-3 | 45 (37.50) |
| | 3-5 | 39 (32.50) |
| | 5-8 | 22 (18.33) |

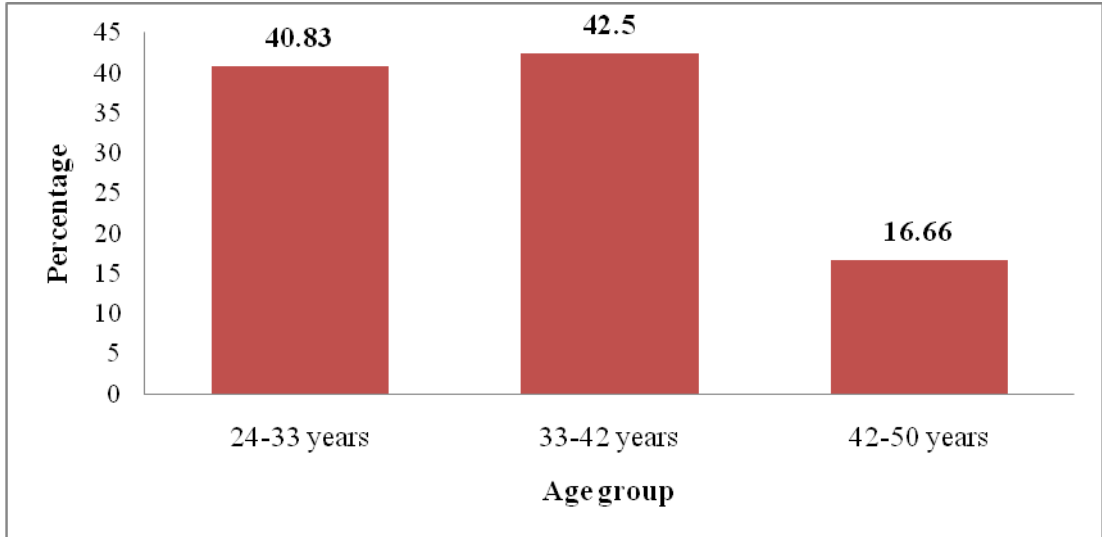


Fig: 4.1 Distribution of respondents by age group (years)

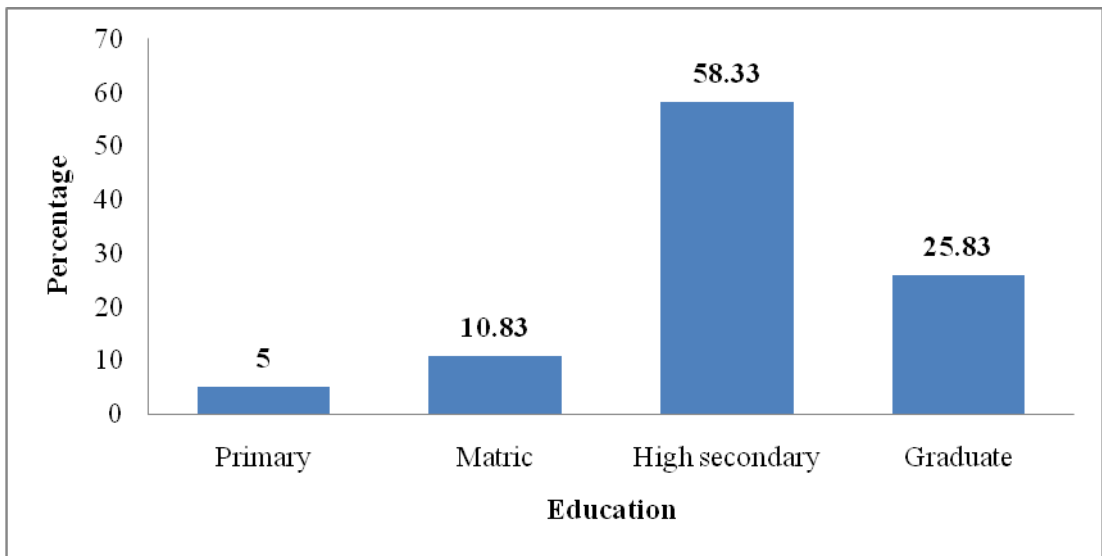


Fig: 4.2 Distribution of respondents by education qualification

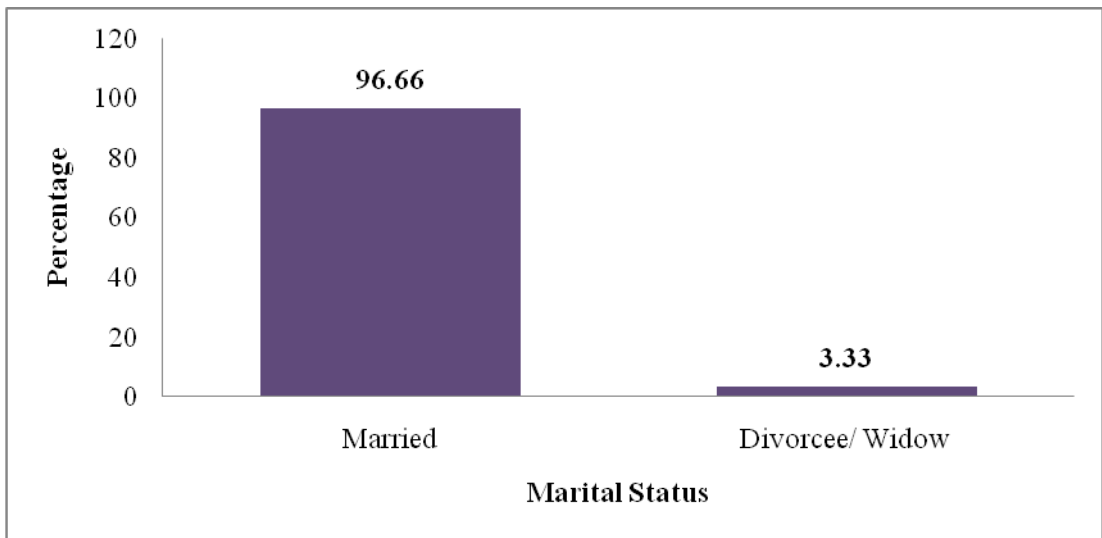


Fig: 4.3 Distribution of respondents by marital status

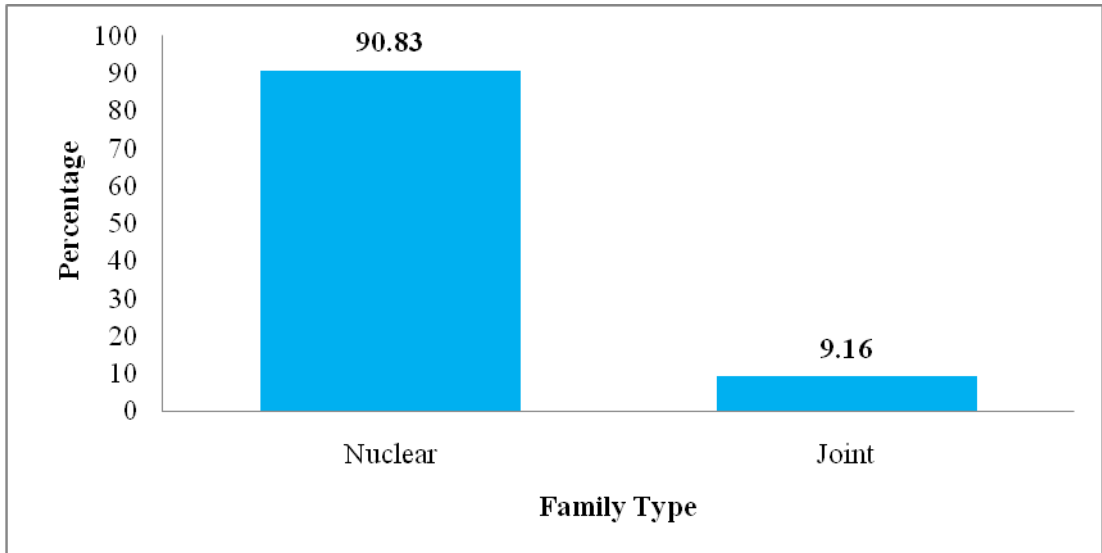


Fig: 4.4 Distribution of respondents by family type

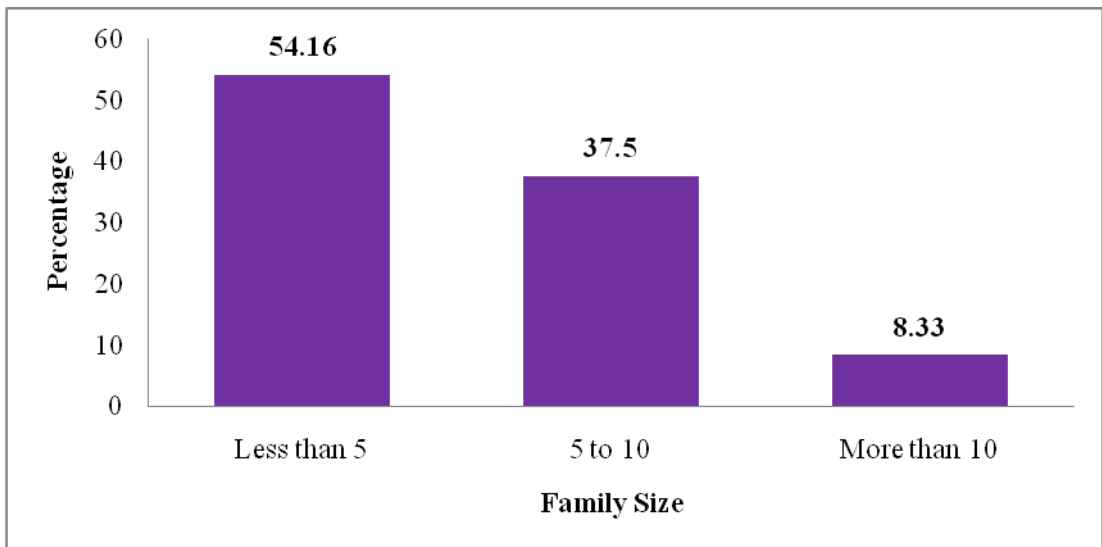


Fig: 4.5 Distribution of respondents by family size

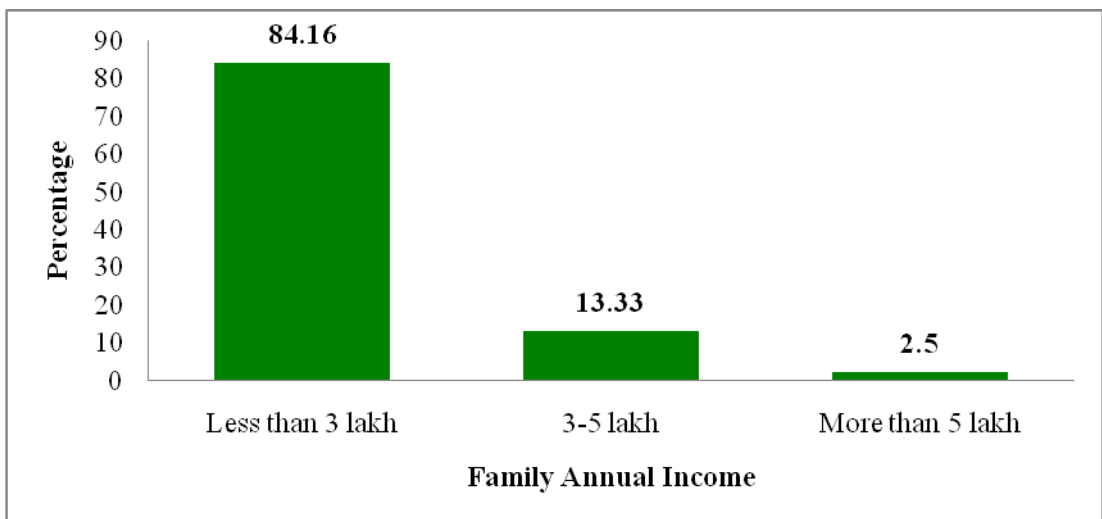


Fig: 4.6 Distribution of respondents by family annual income

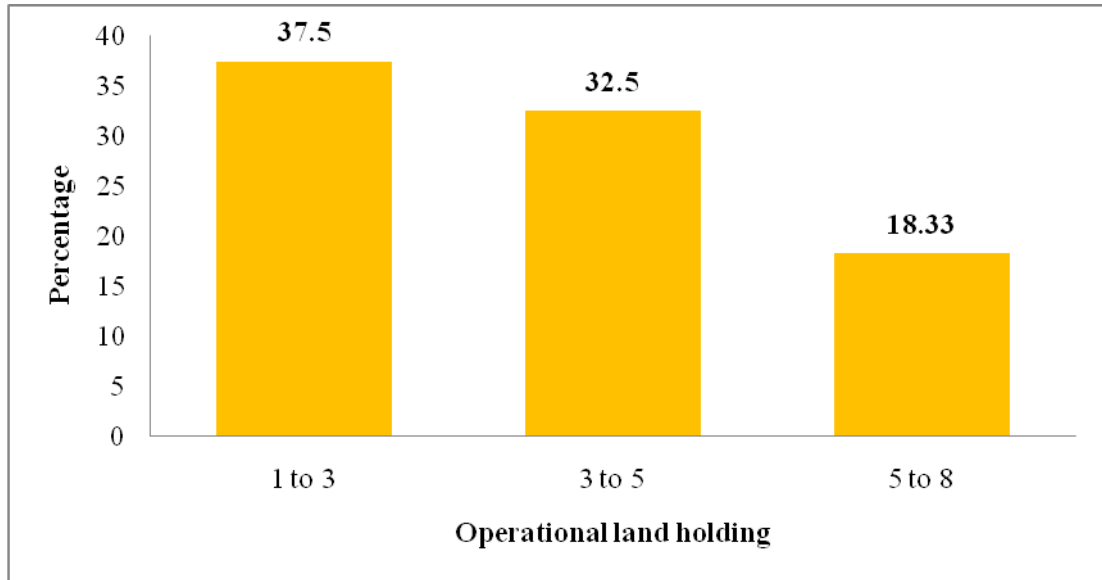


Fig: 4.7 Distribution of respondents by operational land holding

Family annual income: Major sample proportion (84.16%) reported an annual income of less than 3 lakh. Whereas, 13.33 per cent had reported family income of 3-5 lakh and only 2.50 per cent had more than 5 lakh of family income. The findings of this research are in line with the observation reported by Sharma (2016)

Operational land holding: Table 4.1 and fig. 4.7 unveils that 37.50 per cent respondents were having 1-3 acre operational area followed by 32.50 per cent having 3-5 acre area and only 18.33 per cent of respondents were having 5-8 acre operational area for farming of various crops. These findings can be corroborated with the findings of Sharma (2016) who also reported that majority of the farming families in Punjab have marginal to small operational land holdings.

4.2 Assessment of existing status of value addition to farm produce

4.2.1 Distribution of respondents according to the crop cultivation pattern adopted by their families

The scope of Value addition to farm produce largely depends upon the type of produce i.e. the crops cultivated in the area. Hence the cropping pattern of the study area was probed and relevant data is presented in Table 4.2

The perusal of the data regarding cereals crops, reveal that all the families (100.00%) were cultivating wheat in rabi season followed by rice (93.33%) in kharif season with overall average production of 40.70 quintal and 27.38 quintal of wheat and rice respectively. The average marketable surplus of wheat was found to be 34.66 quintal and for rice it was 24.12

quintal. Nearly 42.00 per cent families were cultivating maize with overall average production of 16.43 quintal and average marketable surplus was reported to be 14.95 quintal. The status of value addition in cereals crops indicates that only 18.33 per cent respondents, who were member of SHG (self help group) were involved in value addition of wheat in the form of flour making at secondary stage whereas, no respondent was found to be involved in adding value at primary stage which involves cleaning, drying and sorting and in tertiary stage which includes making of pre-prepared food stuff that can be sold as ready- to- eat.

Further it can be observed in Table 4.2 indicates that in pulses more than one fourth (36.66%) of the families were cultivating green gram (*moong*) in kharif season with overall average production of 3.02 quintal and average marketable surplus of 2.16 quintal followed by 13.33per cent families cultivating lentil with average production of 2.48 quintal and average marketable surplus was found to be 1.83 quintal. Twenty per cent families were cultivating chickpea in rabi season and reported high average production of 5.25 quintal and average marketable surplus of 4.37 quintal in overall pulses category. There was no respondent involved in value addition of pulses at primary, secondary or tertiary stages. More than one fourth of the farm families (39.16%) were cultivating mustard with overall average production of 3.79 quintal and average marketable surplus was 2.97 quintal. The status of mustard value addition showed similar result as that of pulses. The reasons behind low exiting status of value addition in cereals, pulses and oilseeds were involvement of farm women in domestic chores, lack of time management by women, lack of self- confidence to start a pilot work of value addition to farm produce, unwillingness to participate manually so they hire labour for field work, lack of equipment and lack of knowledge regarding value addition processes.

So, it is clear from the above findings that domestic responsibilities restrict farm women mobility as far as seeking for information and training assistance. It is important that extension agents or training officers within the agricultural sector put extra efforts in reaching farm women who had farm, to encourage women to participate in value addition activity which will help them to generate an income for their family and it will help them to boost their self-confidence as well. The extension agents should help them out with training regarding value addition so that they can work independently and such training need to take into consideration farm women's domestic responsibilities if women are to effectively participate in value addition.

Table 4.2: Distribution of respondents according to the crop cultivation pattern adopted by their families

| Name of crop | | No. of respondents' families cultivating the crop | Average area (acre) | Average producti on (qnt.) | Average marketable surplus (qnt.) | Status of value addition | | |
|-----------------|-----------------------|--|------------------------|----------------------------------|--|--------------------------|---------------|-------------|
| | | f (%) | | | | Primary | Secondary | Tertiary |
| | | | | | | f (%) | f (%) | f (%) |
| Cereals | Wheat | 120 (100.00) | 2.15 | 40.70 | 34.66 | 0 (0.00) | 22 (18.33) | 0 (0.00) |
| | Rice | 112 (93.33) | 1.59 | 27.38 | 24.12 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Maize | 51 (42.50) | 1.12 | 16.43 | 14.95 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Pulses | Green gram (moong) | 44 (36.66) | 1.13 | 3.02 | 2.16 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Chickpea (chana) | 24 (20.00) | 1 | 5.25 | 4.37 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Lentil (masur) | 16 (13.33) | 1.20 | 2.48 | 1.83 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Oilseeds | Mustard | 47 (39.16) | 1.05 | 3.79 | 2.97 | 0 (0.00) | 0 (0.00) | 0 (0.00) |

4.2.2 Distribution of respondents according to the fruits cultivation pattern adopted by their families

Fruits are highly perishable in nature so there is a need to add value to minimize the qualitative and quantitative deterioration of the produce after harvest and to increase the shelf life. Various processed products viz. juices, dehydrated products, ketchup, sauces, pickles, chutneys, jam, jelly etc. can be produced from fruits and marketed in local area for income generation. Table 4.3 presents data regarding fruits cultivation pattern adopted by the families of the respondents. Respondent's families did not have any fruit orchard and they only had 1-4 trees in their home backyard or in farm area. Farm women from SHG were involved in value addition whereas, other non- SHG farm women had knowledge only about traditional processing of fruit such as pickle and chutney making which they use for household consumption and not for marketing.

The data in Table 4.3 indicates that 20.83 per cent of the families were having mango trees with overall average production of 83.33 kg and average marketable surplus was 82.11 kg. Only 44.00 per cent of the respondents who were members of SHG (self help group) were involved in primary stage activity such as sorting of fruits and 80.00 per cent of the respondents were involved in value addition at tertiary stage (pickle and jam making). Whereas, 12.50 per cent families were involved in guava growing with overall average production of 128.66 kg, it has been found that guava fruit was used for household consumption and there was no marketable surplus of value added guava.

Similar results were observed for jamun fruit, 10.00 per cent families had jamun trees with overall average production of 81.66 kg but no value addition was found at primary, secondary and tertiary stages. Amla growing families were 6.66 per cent and overall average production was 134.37 kg with average marketable surplus of 132.54 kg. About 37 per cent respondents were involved at primary stage activity such as sorting of fruits and 62.50 per cent were involved at tertiary stage of value addition such as pickle, murrabba and jam making. Kinnow was grown by 15.83 per cent respondents with overall average production of 149.36kg and average marketable surplus of 148.36 kg. In primary stage, sorting of fruit was done by 10.83 per cent respondents and more than half of the respondents (52.63%) were performing value addition at secondary stage in the form of squash and juice making. Only 2.50 per cent of the respondents were growing plum with overall average production of 43.33kg and average marketable surplus of 42.78kg. The status of value addition in plum shows that all the respondents (100.00%) were performing primary activity of sorting and also contributed at secondary stage of value addition in form of squash or juice making. The

Table 4.3: Distribution of respondents according to the fruits cultivation pattern adopted by their families

| Farm produce | | No. of respondents' cultivating the fruits | No. of trees | Average no. of trees in families | Average production (kg) | Average marketable surplus (kg) | Status of value addition | | |
|--------------|--------|--|--------------|----------------------------------|-------------------------|---------------------------------|--------------------------|---------------|---------------|
| | | f (%) | | | | | Primary | Secondary | Tertiary |
| | | | | | | | f (%) | f (%) | f (%) |
| Fruits | Mango | 25 (20.83) | 36 | 1.40 | 83.33 | 82.11 | 11 (44.00) | 0 (0.00) | 20 (80.00) |
| | Guava | 15 (12.50) | 21 | 1.40 | 128.66 | 0 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Jamun | 12 (10.00) | 14 | 1.16 | 81.66 | 0 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Alma | 8 (6.66) | 10 | 1.25 | 134.37 | 132.54 | 3 (37.50) | 0 (0.00) | 5 (62.50) |
| | Kinnow | 19 (15.83) | 28 | 1.47 | 149.36 | 148.36 | 13 (10.83) | 10 (52.63) | 0 (0.00) |
| | Plum | 3 (2.50) | 5 | 1.66 | 43.33 | 42.78 | 3 (100.00) | 3 (100.00) | 0 (0.00) |

results indicate that though the farm women have traditional knowledge of preservation and processing of fruits but they were not involved in adding price to that processed product and only those who were part of some organization or have got training from any institute were active in value addition of fruits.

So, it is clear from the above findings that farm women who were member of SHG (self help group) were skilled in value addition process and marketing sector as compared to those women who were not a part of any SHG (self help group) such women lack self-confidence and motivation, lack of knowledge about value addition process, marketing skill and technical knowledge to add value.

4.2.3 Distribution of respondents according to the vegetables cultivation pattern adopted by their families

Tables 4.4 illustrate the data regarding existing status of value addition of vegetables cultivated by farm women families. There were few families cultivating vegetables only for household consumption and not for marketing whereas, some families had hired labour for cultivating vegetables for marketing purpose.

The data in Table 4.4 reveals that 14.16 per cent families were cultivating cauliflower with overall average production of 28.47 quintal and average marketable surplus of 27.55 quintal. About 18 per cent respondents were cultivating bottle gourd with overall average production of 50.95 quintal and 49.77 quintal average marketable surplus. Nearly 16 per cent respondents were cultivating bitter gourd for household purpose with overall average production of 3.47 quintal. Similarly lady finger and carrot were cultivated for household purpose by 10.83 per cent and 9.16 per cent respondents respectively with overall average production of 3.57 quintal and 6.84 quintal respectively. Number of families cultivating tomato and potato were same (14.16%) with overall average production of 20.6 quintal for tomato and 38.70 quintal for potato. The market surplus of tomato was 19.73 quintal and for potato it was observed as 37.52 quintal. About 11 per cent families were cultivating garlic with overall average production of 10.92 quintal and average market surplus of 9.96 quintal, onion was cultivated by 12.50 per cent families with overall average production of 35.50 quintal and average market surplus of 34.46 quintal. The results further reveal that only garlic was used for value addition by farm women at tertiary stage (pickle making) and farm women had no role in value addition of other vegetables. So it is clear from the above findings that farm women showed least interest in value addition of vegetables, the reason behind it was lack of time management, lack of knowledge regarding value addition of vegetables and

Table 4.4: Distribution of respondents according to the vegetables cultivation pattern adopted by their families

| Farm produce | | No. of respondents' cultivating the vegetables | Average area (in acre) | Average production (qnt.) | Average marketable surplus (qnt.) | Status of value addition | | |
|--------------|--------------|--|------------------------|---------------------------|-----------------------------------|--------------------------|-------------|---------------|
| | | f (%) | | | | Primary | Secondary | Tertiary |
| | | | | | | f (%) | f (%) | f (%) |
| Vegetables | Cauliflower | 17 (14.16) | 0.31 | 28.47 | 27.55 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Bottle gourd | 22 (18.33) | 0.26 | 50.95 | 49.77 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Bitter gourd | 19 (15.83) | 0.1 | 3.47 | - | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Lady finger | 13 (10.83) | 0.07 | 3.57 | - | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Tomato | 17 (14.16) | 0.10 | 20.6 | 19.73 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Potato | 17 (14.16) | 0.40 | 38.70 | 37.52 | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Carrot | 11 (9.16) | 0.03 | 6.84 | - | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| | Garlic | 14 (11.66) | 0.22 | 10.92 | 9.96 | 0 (0.00) | 0 (0.00) | 10 (71.42) |
| | Onion | 15 (12.50) | 0.27 | 35.50 | 34.46 | 0 (0.00) | 0 (0.00) | 0 (0.00) |

technical handling of equipment, lack of cold storage facilities as vegetables are easily perishable. The findings of the study are in line with the observations reported by Kumar *et al* (2010) who stated that high cost of equipment, lack of knowledge about processing, packing, equipment used and skills about handling of machinery used for value addition, lack of storage infrastructure, high storage charges and unsatisfactory condition of cold storage as the reasons for not going for value addition.

4.2.4 Distribution of respondents according to the number of dairy animals owned by their families

Dairy farmer have the opportunity to add value to raw milk by producing a wide variety of processed product such as curd, butter, khoya, cheese, buttermilk etc, so the study of value addition performed in dairy farm families was analyzed and relevant data is presented in Table 4.5.

The perusal of the data reveals that half of the respondents (50.00%) had cow with overall average production of 58.16 liters milk and average marketable surplus was 54.14 liters milk. More than one fourth of the respondent (29.16%) had buffalo with overall average production of 35.67 liters milk and average marketable surplus was 32.42 liters milk. Only 7.50 per cent of the respondents had goat with overall average production of 12 liters milk and 10.88 liters milk was the average marketable surplus. There was no respondent involved in value addition at secondary and tertiary stage, whereas, 58.33 per cent, 60.00 per cent and 100.00 per cent of the respondents were involved in milking of cow, buffalo and goat respectively at primary stage.

The findings show that respondents usually sold raw milk directly to consumer or in dairy. Respondents had knowledge about processing of milk just for household purpose and not for commercial purpose. The reason behind it was lack of self-confidence, lack of time management, lack of equipment for processing of milk and lack of storage because milk is a perishable item. The findings of this research are supported with those of Wanga *et al* (2009), who stated that milk is a highly perishable product, and the women did not have any cooling or preservation equipment to increase the shelf life of milk.

4.2.5 Distribution of respondents according to the number of poultry animal owned by their families

The perusal of the data reveals that in poultry only 3.33 per cent of the respondents had egg laying hen with average production of 10 eggs weekly and no marketable surplus was found because the respondent belonged to joint family who owned poultry for household consumption and not for commercial purpose. There was no value

Table 4.5: Distribution of respondents according to the number of dairy animals owned by their families

| Farm produce | | No. of respondents' involved in dairy produce | No. of animals | Average no. of animals in families | Average production (ltr.) | Average marketable surplus (ltr.) | Status of value addition | | |
|--------------|---------|---|----------------|------------------------------------|---------------------------|-----------------------------------|--------------------------|-------------|-------------|
| | | f (%) | | | | | Primary | Secondary | Tertiary |
| | | | | | | | f (%) | f (%) | f (%) |
| Dairy | Cow | 60 (50.00) | 312 | 5 | 58.16 | 54.15 | 35 (58.33) | 0 (0.00) | 0 (0.00) |
| | Buffalo | 35 (29.16) | 206 | 6 | 35.67 | 32.42 | 21 (60.0) | 0 (0.00) | 0 (0.00) |
| | Goat | 9 (7.50) | 33 | 4 | 12.00 | 10.88 | 9 (100.00) | 0 (0.00) | 0 (0.00) |

Table 4.6: Distribution of respondents according to the bee-keeping farming owned by their families

| Bee-keeping | No. of respondents' involved in bee-keeping | No. of bee box | Average no. of boxes | Average production (kg) | Average marketable surplus (kg) | Status of value addition | | |
|-------------|---|----------------|----------------------|-------------------------|---------------------------------|--------------------------|-------------|-------------|
| | F (%) | | | | | Primary | Secondary | Tertiary |
| | | | | | | f (%) | f (%) | f (%) |
| Honey | 1 (0.83%) | 250 | 250 | 12,500 | 12,480 | 1 (100.00) | 0 (0.00) | 0 (0.00) |

addition observed at secondary and tertiary stage due to lack of knowledge regarding adding value to egg in other form, unwillingness to practice due to poor health issue, lack of equipment, lack of storage, lack of time management and lack of training assistance.

So it can be concluded that a strong policies and plans for improvement of food processing infrastructure including up-gradation of technology and enforcement of quality standards, promoting investment in food processing, activating domestic market with focus and support of farm women to practice value addition in allied farm produce.

4.2.6 Distribution of respondents according to the bee-keeping farming owned by their families

The data presented in Table 4.6 indicates that only 0.83 per cent respondent was involved in bee-keeping with overall average production of 12,500 kg and average marketable surplus was observed to be 12,480 kg. The status of existing value addition in bee-keeping reported that respondents were performing primary activity such as extraction of honey in bee-keeping, whereas, no further value addition was done in honey at secondary and tertiary stage.

The findings reveal that respondent belonged to SHG (self help group) used to sell honey in raw form during Kisan Mela and in local market. Although the respondent belonged to self help group but still they lack processing of honey at secondary and tertiary stage the reason behind no further value addition in honey was due to lack of equipment, lack of knowledge and lack of time management.

Government of Punjab had initiated many plans to promote value addition of honey in different districts of Punjab by providing a platform to manufacture processed honey along with other value added products such as jaggery, toffees, soaps and lotions. PAU (Punjab Agricultural University) also provides training to bee owner regarding value addition of honey, breeding etc. The women farmer should participate in value addition of honey which not only helps them to generate income but also build their self-confidence to start their own venture in regard to value addition to farm produce.

4.3 Determination of the role of farm women in value addition

4.3.1 Distribution of respondents according to their participation in value addition to farm produce at primary stage

The participation of farm women in value addition to various farm produce independently, jointly with others or no participation have been presented in Table 4.7

The data in Table 4.7 reveals that all the respondents (100.00%) have not participated in value addition process of cereals, pulses and oilseeds at primary stage which includes cleaning, drying, sorting. The reason behind respondents poor participation level was due to

lack of time management women were busy in domestic chore, hire labour for manual work or their husband itself work on field, shyness from male gender because on field, number of male worker is more which makes women hesitate to perform primary activity on field. Results indicate that even women belonged from SHG (self help group) did not participated in value addition process at primary level because they lack high cost machinery for cleaning, drying and sorting in cereals and pulses, that's why they use to transport their farm produce such as cereals and pulses in CIPHET (Central Institute of Postharvest Engineering and Technology) for cleaning and sorting activity in PAU (Punjab Agricultural University).

In farm produce category, fruits growing respondents do not have orchard they just have 1-4 trees in their home backyard or in their farm area, some of the respondent use for household consumption whereas, farm women who were part of SHG(self help group) use fruits for value addition. The respondents participation at primary stage of fruits includes sorting of fruits i.e. selecting of good quality of fruits and removing rotten fruits during value addition process basically done by members of SHG (self help group) only.

The data shows 44.00 per cent of the respondents were jointly participated with others in sorting of mango at primary stage and more than half of the respondents (56.00%) were reported no participation at primary stage followed by amla 37.50 per cent participated jointly with others and 62.50 per cent of the respondents were observed no participation. Majority of the respondents (68.42%) shows jointly participation in sorting of kinnow fruits at primary stage and more than one fourth of the respondents (31.57%) were reported no participation, whereas, in plum all respondents (100.00%) were participated jointly with others in selecting of good quality of fruits and removing rotten fruits at primary stage.

The findings reveal that farm women who were part of SHG(self help group) were involved in value addition process of fruits as compare to those farm women who were not a part of SHG(self help group). The reason behind no participation of non- SHG farm women was due to unwillingness to practice value addition because of lack of time management women involvement in domestic chores, lack of knowledge, lack of family support, lack of marketing skill and lack of training assistance. Though the women had traditional knowledge of processing of fruits in form of pickle and chutney for household consumption but lack of self-confidence and lack of time management hinders to start a venture to generate income for their families.

Similarly in vegetables cultivating farm families all respondents (100.00%) showed no participation in sorting activity of vegetables at primary stage as in cereals. The reason behind it was either men of the farm families work or hire labour to work on their field, lack of time management due to involvement of women in domestic chores, shyness from male

gender i.e. on field male worker are more in number which makes them hesitate to work in same environment.

In dairy, data reveals that 20.00 per cent of the respondents were participating independently in milking of cow and 38.33 per cent were jointly participated in milking activity and 41.66 per cent showed no participation because of more number of cows in their respective households they have hire other member for the task followed by one fourth of the respondents (25.71%) who had buffalos participated independently in milking activity at primary stage and 34.28 per cent respondents were participated jointly with others. About 40.00 per cent of the respondents show no participation in milking of buffalo at primary stage and the respondents who had goat in their household indicates 100.00 per cent participation independently at primary stage. In poultry respondents do not participated in value addition due to lack of knowledge at primary stage, whereas in bee-keeping there was only one respondent who owned bee farming and participated jointly with other members in honey extraction process at primary stage.

The findings reveal that farm families' women who own dairy animals are actively participating at primary stage of milk value addition independently or jointly with others in their respective households. There are few women reported no participation because of large number of animals so they have hire other person for milking activity because some of the respondents had poor health issue related to muscular disorder.

Table 4.7: Distribution of respondents according to their participation in value addition to farm produce at primary stage

| Farm produce | | Participation of farm women at primary stage | | |
|--------------|--------------------|--|---------------------|------------------|
| | | Independently | Jointly with others | No participation |
| | | f (%) | f (%) | f (%) |
| Cereals | Wheat | 0 (0.00) | 0 (0.00) | 120 (100.00) |
| | Rice | 0 (0.00) | 0 (0.00) | 112 (100.00) |
| | Maize | 0 (0.00) | 0 (0.00) | 51 (100.00) |
| Pulses | Green gram (moong) | 0 (0.00) | 0 (0.00) | 44 (100.00) |
| | Chickpea (chana) | 0 (0.00) | 0 (0.00) | 24 (100.00) |
| | Lentil (masur) | 0 (0.00) | 0 (0.00) | 16 (100.00) |

| Farm produce | | Participation of farm women at primary stage | | |
|--------------------|--------------|--|---------------------|------------------|
| | | Independently | Jointly with others | No participation |
| | | f (%) | f (%) | f (%) |
| Oilseeds | Mustard | 0 (0.00) | 0 (0.00) | 47 (100.00) |
| Fruits | Mango | 0 (0.00) | 11 (44.00) | 14 (56.00) |
| | Guava | 0 (0.00) | 0 (0.00) | 15 (100.00) |
| | Jamun | 0 (0.00) | 0 (0.00) | 12 (100.0) |
| | Amla | 0 (0.00) | 3 (37.50) | 5 (62.50) |
| | Kinnow | 0 (0.00) | 13 (68.42) | 6 (31.57) |
| | Plum | 0 (0.00) | 3 (100.00) | 0 (0.00) |
| Vegetables | Cauliflower | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Bottle gourd | 0 (0.00) | 0 (0.00) | 22 (100.00) |
| | Bitter gourd | 0 (0.00) | 0 (0.00) | 19 (100.00) |
| | Lady finger | 0 (0.00) | 0 (0.00) | 13 (100.00) |
| | Tomato | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Potato | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Carrot | 0 (0.00) | 0 (0.00) | 11 (100.00) |
| | Garlic | 0 (0.00) | 0 (0.00) | 14 (100.00) |
| | Onion | 0 (0.00) | 0 (0.00) | 15 (100.00) |
| Dairy | Cow | 12 (20.00) | 23 (38.33) | 25 (41.66) |
| | Buffalo | 9 (25.71) | 12 (34.28) | 14 (40.00) |
| | Goat | 9 100.00 | 0 (0.00) | 0 (0.00) |
| Poultry | Hen | 0 (0.00) | 0 (0.00) | 4 (100.00) |
| Bee-keeping | Bee | 0 (0.00) | 1 (100.00) | 0 (0.00) |

In overall the above findings reveal that farm women had no participation in value addition of cereals, pulses, oilseeds and vegetables at primary stage which includes cleaning, drying, sorting etc. independently or jointly with other members because either men of the farm families perform or hire labour for field job, whereas, in fruits, dairy and beekeeping farm women perform primary stage activity independently and jointly with other members.

4.3.2 Distribution of respondents according to their participation in value addition to farm produce at secondary stage

The data in Table 4.8 revealed about the distribution of the respondents according to their participation in value addition to farm produce at secondary stage. Secondary stage activity includes grinding, past, juice, curd making etc. where primary product processed, to edible food.

In cereals, nearly 18 per cent of the respondents show joint participation with others in value addition of wheat and 81.66 per cent of the respondents were reported no participation followed by rice, maize no participation shows by any of the respondent. Similarly in pulses and oilseeds no one participated in value addition process at secondary stage. Results depicted that few women respondents who were member of SHG(self help group) have the grinding machine which they used to add value in wheat in form of flour and sold it under their SHG(self help group) brand in local market, whereas, farm women who were not a part of SHG(self help group) shows no participation. The reason behind it was lack of knowledge, lack of high cost equipment, lack of time management and unwillingness to participate due to household chores.

In fruits, respondents who had kinnow and plum trees were involved in value addition of fruits, whereas, other fruits grower used to consume in raw form or processed at tertiary stage such as guava, jamun, mango and amla. All of the respondents (100.00%) were plum grower found to be participated jointly with other members in value addition of plum in form of juice making at secondary stage followed by more than half of the respondents (52.63%) were kinnow grower participated in value addition process jointly with other members at secondary stage and 47.36 per cent of the respondents were reported no participation, whereas, 100.00 per cent of the respondents of mango, guava, jamun and amla grower had not participated in value addition process independently or jointly with other members at secondary stage. The findings reveal that farm women belonged to SHG(self help group) had knowledge about processing of fruits in form of juice or squash making and are skilled in marketing of value added products as compare to non- SHG farm women but still value addition in fruits results low because of lack of storage, fruits are perishable item so it need cold storage to preserve and extend the shelf life.

Table 4.8: Distribution of respondents according to their participation in value addition to farm produce at secondary stage

| Farm produce | | Participation of farm women at secondary stage | | |
|--------------|--------------------|--|---------------------|------------------|
| | | Independently | Jointly with others | No participation |
| | | f (%) | f (%) | f (%) |
| Cereals | Wheat | 0 (0.00) | 22 (18.33) | 98 (81.66) |
| | Rice | 0 (0.00) | 0 (0.00) | 112 (100.00) |
| | Maize | 0 (0.00) | 0 (0.00) | 51 (100.00) |
| Pulses | Green gram (moong) | 0 (0.00) | 0 (0.00) | 44 (100.00) |
| | Chickpea (chana) | 0 (0.00) | 0 (0.00) | 24 (100.00) |
| | Lentil (masur) | 0 (0.00) | 0 (0.00) | 16 (100.00) |
| Oilseeds | Mustard | 0 (0.00) | 0 (0.00) | 47 (100.00) |
| Fruits | Mango | 0 (0.00) | 0 (0.00) | 25 (100.00) |
| | Guava | 0 (0.00) | 0 (0.00) | 15 (100.00) |
| | Jamun | 0 (0.00) | 0 (0.00) | 12 (100.00) |
| | Amla | 0 (0.00) | 0 (0.00) | 8 (100.00) |
| | Kinnow | 0 (0.00) | 10 (52.63) | 9 (47.36) |
| | Plum | 0 (0.00) | 3 (100.00) | 0 (0.00) |
| Vegetables | Cauliflower | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Bottle gourd | 0 (0.00) | 0 (0.00) | 22 (100.00) |
| | Bitter gourd | 0 (0.00) | 0 (0.00) | 19 (100.00) |
| | Lady finger | 0 (0.00) | 0 (0.00) | 13 (100.00) |
| | Tomato | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Potato | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Carrot | 0 (0.00) | 0 (0.00) | 11 (100.00) |
| | Garlic | 0 (0.00) | 0 (0.00) | 14 (100.00) |
| | Onion | 0 (0.00) | 0 (0.00) | 15 (100.00) |

| Farm produce | | Participation of farm women at secondary stage | | |
|--------------|---------|--|---------------------|------------------|
| | | Independently | Jointly with others | No participation |
| | | f (%) | f (%) | f (%) |
| Dairy | Cow | 0 (0.00) | 0 (0.00) | 60 (100.00) |
| | Buffalo | 0 (0.00) | 0 (0.00) | 35 (100.00) |
| | Goat | 0 (0.00) | 0 (0.00) | 9 (100.00) |
| Poultry | Hen | 0 (0.00) | 0 (0.00) | 4 (100.00) |
| Bee-keeping | Bee | 0 (0.00) | 0 (0.00) | 1 (100.00) |

Results indicated that non- SHG farm women have knowledge about processing of fruits but lack in value addition of fruits in form of generating income directly, unwillingness to work manually, lack of family support, lack of financial assistance, lack of training assistance, lack of knowledge regarding secondary processing of value addition.

The data revealed that in vegetables, all respondent (100.00%) were reported no participation in value addition of cauliflower, bottle gourd, lady finger, tomato, potato, carrot, garlic and onion. The reason behind it was respondents' lack of knowledge regarding processing of vegetables at secondary stage, lack of training assistance, lack of marketing skill and unwillingness to perform manual work due to hectic domestic chores, poor health issue. Another reason was the consumption preference of vegetables in staple form.

In dairy, all respondents (100.00%) were not involved in value addition of cow, buffalo and goat milk, independently or jointly with others at secondary stage. Results depicted that adding value to dairy produce was known to all respondents like making of curd, *ghee*, butter and *khoya* etc. with basic equipment and methods of value addition at household purpose and not for marketing purpose. In poultry respondents do not participated independently or jointly with other members due to lack of knowledge in processing, lack of equipment and lack of training assistance. Similar results was indicated in bee-keeping as well.

In overall the above findings reveal that farm families' respondents who were part of SHG (self help group) involved in value addition of wheat, in cereals followed by kinnow and plum in fruits jointly with other members at secondary stage. Whereas, no value addition performed in other farm produce due to lack of knowledge, lack of time management, lack of equipment, lack of training assistance and lack of self-confidence despite women had basic

knowledge and they use to perform value addition for household consumption and not for generating income.

4.3.3 Distribution of respondents according to their participation in value addition to farm produce at tertiary stage

The data presented in Table 4.9 reveals the respondents participation in value addition to various farm produce independently, jointly with others or no participation at tertiary stage.

In cereals, all of the respondents (100.00%) showed no participation in value addition of wheat, rice and maize independently or jointly with other members at tertiary stage. Similarly in pulses and oilseeds all of the respondents (100.00%) were reported no participation independently or jointly with other members at tertiary stage. The results reveal that being in farm families women were not contributing in value addition process at tertiary stage, the reason behind it was lack of knowledge, lack of time management due to domestic chores, lack of financial assistance, lack of self-confidence to start a value addition to farm produce at pilot level, lack of training assistance, lack of equipment and lack of storage.

In fruits, The respondent growing guava, jamun, kinnow and plum were reported 100.00 per cent no participation independently or jointly with other members in value addition process at tertiary stage followed by majority of the respondents (80.00%) were mango grower who were member of SHG (self help group) involved in value addition process of pickle making jointly with other members at tertiary stage, amla 62.50 per cent of the respondents participated in value addition process of pickle and murrabba making jointly with other members at tertiary stage. About 20.00 per cent of the respondents reported no participation independently or jointly with other members in value addition process at tertiary stage. The findings reveal that only SHG (self help group) farm women have knowledge about marketing skill whereas, other farm women have lack of knowledge in processing of fruits, lack of storage facilities, lack of time management and unwillingness to work due to involvement in domestic chores, lack of family support and lack of self-confidence.

In vegetables only 71.42 per cent of the respondents were garlic growers who were member of SHG (self help group) participated in value addition of garlic in form of pickle making and more than one fourth of the respondents (28.58%) reported no participation in value addition process at tertiary stage. The reason behind it was lack of time management, lack of self-confidence, lack of family support, lack of training assistance, lack of unwillingness to practice due to poor health issue and domestic chores.

Table 4.9: Distribution of respondents according to their participation in value addition to farm produce at tertiary stage

| Farm produce | | Participation of farm women at tertiary stage | | |
|--------------|--------------------|---|---------------------|------------------|
| | | Independently | Jointly with others | No participation |
| | | f (%) | f (%) | f (%) |
| Cereals | Wheat | 0 (0.00) | 0 (0.00) | 120 (100.00) |
| | Rice | 0 (0.00) | 0 (0.00) | 112 (100.00) |
| | Maize | 0 (0.00) | 0 (0.00) | 51 (100.00) |
| Pulses | Green gram (moong) | 0 (0.00) | 0 (0.00) | 44 (100.00) |
| | Chickpea (chana) | 0 (0.00) | 0 (0.00) | 24 (100.00) |
| | Lentil (masur) | 0 (0.00) | 0 (0.00) | 16 (100.00) |
| Oilseeds | Mustard | 0 (0.00) | 0 (0.00) | 47 (100.00) |
| Fruits | Mango | 0 (0.00) | 20 (80.00) | 5 (20.00) |
| | Guava | 0 (0.00) | 0 (0.00) | 15 (100.00) |
| | Jamun | 0 (0.00) | 0 (0.00) | 12 (10.00) |
| | Amla | 0 (0.00) | 5 (62.50) | 3 (37.50) |
| | Kinnow | 0 (0.00) | 0 (0.00) | 19 (100.00) |
| | Plum | 0 (0.00) | 0 (0.00) | 3 (100.00) |
| Vegetables | Cauliflower | 0 (0.00) | 0 (0.00) | 11 (64.70) |
| | Bottle gourd | 0 (0.00) | 0 (0.00) | 22 (100.00) |
| | Bitter gourd | 0 (0.00) | 0 (0.00) | 19 (100.00) |
| | Lady finger | 0 (0.00) | 0 (0.00) | 13 (100.00) |
| | Tomato | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Potato | 0 (0.00) | 0 (0.00) | 17 (100.00) |
| | Carrot | 0 (0.00) | 0 (0.00) | 11 (100.00) |
| | Garlic | 0 (0.00) | 10 (71.42) | 4 (28.57) |
| | Onion | 0 (0.00) | 0 (0.00) | 15 (100.00) |

| Farm produce | | Participation of farm women at tertiary stage | | |
|--------------|---------|---|---------------------|------------------|
| | | Independently | Jointly with others | No participation |
| | | f (%) | f (%) | f (%) |
| Dairy | Cow | 0 (0.00) | 0 (0.00) | 60 (100.00) |
| | Buffalo | 0 (0.00) | 0 (0.00) | 35 (100.00) |
| | Goat | 0 (0.00) | 0 (0.00) | 9 (100.00) |
| Poultry | Hen | 0 (0.00) | 0 (0.00) | 4 (100.00) |
| Bee-keeping | Bee | 0 (0.00) | 0 (0.00) | 1 (100.00) |

In dairy, all the respondents (100.00%) were reported no participation in value addition of dairy produce at tertiary stage, a similar result was found in poultry and bee-keeping as well. The reason behind it was lack of high cost equipment, lack of storage facilities, lack of knowledge and lack of training assistance, lack of family support.

The overall findings reveal that at tertiary stage farm women of SHG (self help group) participated in value addition of mango, plum and garlic in form of pickle and squash making. The respondents of SHG (self help group) were trained in value addition process as compare to non- SHG farm women because of lack of marketing skill, lack of self-confidence and lack of training assistance.

4.4 Identification of the constraints faced by farm women

The data pertaining to constraints faced by farm women in value addition to farm produce was further divided into technical, personal, infrastructure and miscellaneous constraints.

Technical constraints: The data in Table 4.10 reveals that majority (90.83%) of farm women faced lack of technical knowledge regarding process of value addition and 84.16 per cent lack of knowledge about equipment and machines whereas, 72.50 per cent of the respondents lack of access to technological tool.

Personal constraints: The data in the Table 4.10 unveils that maximum number of respondents (85.83%) shows unwillingness to practice value addition followed by low self confidence and motivation factor (80.00%), poor health (68.33%) lack of family support (57.50%) and least result showed (42.50%) in case of gender biasness.

Table 4.10 Distribution of respondents according to the constraints faced by them

N=120

| Sr. no. | Constraints | f | % |
|----------------|---|----------|----------|
| a. | Technical Constraints | | |
| 1. | Lack of technical knowledge regarding process of value addition | 109 | 90.83 |
| 2. | Lack of knowledge about equipment and machines | 101 | 84.16 |
| 3. | Lack of access to technological tool | 87 | 72.50 |
| b. | Personal Constraints | | |
| 1. | Unwillingness to practice value addition | 103 | 85.83 |
| 2. | Low self confidence and motivation factor | 96 | 80.00 |
| 3. | Poor health | 82 | 68.33 |
| 4. | Lack of family support | 69 | 57.50 |
| 5. | Shyness from male trainer | 51 | 42.50 |
| c. | Infrastructure Constraints | | |
| 1. | Lack of cold chain | 113 | 94.16 |
| 2. | Lack of storage facility | 107 | 89.16 |
| 3. | Lack of equipment | 96 | 80.00 |
| 4. | Poor supply of electricity and water | 50 | 41.67 |
| 5. | Poor transportation facility | 34 | 28.33 |
| d. | Miscellaneous Constraints | | |
| 1. | Lack of training opportunity | 110 | 91.66 |
| 2. | Lack of contact with extension agents | 104 | 86.66 |
| 3. | Lack of time management | 87 | 72.50 |
| 4. | Less demand of value added products | 70 | 58.33 |

Infrastructure: The perusal of data reveals that due to lack of cold chain (94.16%), (89.16%) lacks of storage facility, (80%) lack of equipment to run the value addition process to farm produce. However, poor transportation facility and poor supply of resource also hinders the value addition to farm produce. These findings are in line with those of Kumar *et al* (2010) who reported that respondents were not going for value addition, because of lack of storage infrastructure, high storage charges and unsatisfactory condition of cold storage.

Miscellaneous: Training can play a key role in helping farm women to become self-dependent. Other vocational training programmes help them to build a wide set of soft skills, and increase their family income Dunning (2013). Majority (91.66%) feels lack of training opportunity, (86.66%) in respect to lack of contact with extension workers, (72.50%) due to lack of time management. (58.33%) leads to less demand of value addition products.

Similar study was reported by Mishra (2013) that major constraints faced by farm women in agriculture male dominance, no knowledge about improved technology was the most important problems affecting the participation of rural women in agriculture activities .Other factors in order of sequence was lack of information about new technologies, poor economic status of the family, lack of knowledge, lack of awareness, family norms, high cost of farm material.

On the basis of above findings we can sum up that farm families' women had high secondary level of education qualification and knowledge about value addition to farm produce for household purpose only. They had least interest in value addition to farm produce and the reason behind it was lack of unwillingness to practice, lack of self-confidence and lack of training assistance. Farm women who were a part of SHG (self help group) were involved in value addition to farm produce independently and jointly with other members. They used to transport their farm produce to CIPHET (Central Institute of Postharvest Engineering and Technology) for cleaning and sorting activity in PAU (Punjab Agricultural University). Farm women of SHG also faced constraints in regards to technical handling of equipment and high cost of equipment.

CHAPTER V

SUMMARY

Value addition to farm produce has made significant contribution to agriculture sector of India. The concept of value addition in agriculture, in the developing economies is widely becoming an acceptable strategy adopted by both government and non-governmental organizations towards improving the income generation of the rural communities. The farmer trend in which rural farmers disposed-off their farms produce without processing seems to be drastically reduced through such transactions.

Value-added agriculture entails changing a raw farm produce into something new through packaging, processing, cooling, drying, extracting or any other type of process that differentiates the product from the original raw commodity. It is a worthwhile endeavor because of the higher returns that come with the investment, the opportunities for farm women at household level as well as the ability to create new recognition for the farm.

Though India is among top 5 producers in worldwide of rice, wheat, groundnut, spices, oilseeds etc. but holds less contribution in value addition to farm produce. Hence, there is need to emphasize more on value addition so that the wastage of farm produce can be reduced.

The economic returns from farming are diminishing due to various factors. Hence, it has become imperative to resort to some practices which may help to make the farming more remunerative. Adding value to farm produce is one of the most measures to enhance profits from agriculture. Mechanization is an essential input not only for crop production, but it also has a crucial role to play along the entire value chain. By mechanizing the whole process of agricultural crop value addition from planting to marketing, higher value outputs can be produced, rural employment can be created and sustained, post-harvest losses can be reduced, quality can be enhanced and smallholders can be integrated into the market economy.

As Government is giving tremendous input for food processing so that the wastage of farm produce can be reduced and income generation activities could be elevated. Keeping the above concept in the view, the research is designed to study role of farm women in value addition to farm produce. Thus, it become imperative to know women contribution in value addition to farm produce as women is pivotal part of national economy.

Objectives

1. To study the existing status of value addition to farm produce in selected households.
2. To determine the role of farm women in value addition to farm produce.
3. To study the constraints faced by farm women in value addition to farm produce.

A planned and systematic procedure was followed for conducting the study, analysis and interpretation of data. A sample of 120 respondents from farm families of four different villages of two different blocks of district Ludhiana comprising 30 respondents from each village was randomly selected. An interview schedule was designed to collect the data and a random sampling technique was used for the selection of 120 farm women. The sarpanch of the selected villages were contacted and purpose of the study was explained to them.

Data was analyzed using statistical techniques like frequencies, percentage and arithmetic mean.

The salient findings of the research study are summarized below:

- Regarding socio-personal and economic profile of the respondents, maximum number of the farm women (42.50%) belonged to 33-42 years of age, had high secondary level of education status. The findings of the study also revealed that maximum number of the respondents from farm families possessed 1-3 acre of operational land, had small family size (less than 5 member). While looking at their family type the results indicated that majority of farm women had nuclear family. The results on annual income depicted that majority of farm women belonged to small income group (less than 3 lakh).
- In overall crop cultivation pattern 100.00 per cent of the respondents of farm families were wheat grower, had high average production (40.70 quintal) with average marketable surplus of 34.66 quintal. The overall status of value addition of crop cultivating farm families indicates that nearly 18 per cent of the respondents who were member of SHG (self help group) involved in value addition of wheat in form of flour making at secondary stage whereas, no respondent found to be involved in adding value at primary and tertiary stage.
- In fruits value addition process, the farm families have no orchard, they were just having 1-4 trees in their home backyard or in farm area. Farm women from SHG (self help group) were involved in value addition whereas, other non- SHG farm women had knowledge about traditional processing of fruits such as pickle and chutney making which they use for household consumption and not for marketing purpose. Results indicated that those who were part of some organization or have trained from any institute were active in value addition process of fruits because they are skilled in value addition processing and marketing sector as compare to women who were not the part of SHG (self help group) the reason behind it was lack of self-confidence and motivation, lack of marketing skill and lack of technical knowledge to add value.

- The findings reveal that women showed least interest in value addition of vegetables, due to lack of time management, unwillingness to practice value addition because of manual labour, poor health issue and lack of knowledge regarding value addition of vegetables.
- In overall vegetables only garlic cultivation farm families' women, who were part of SHG (self help group) performed value addition of garlic in form of pickle and use to sell during Kisan Mela and in local market.
- The findings reveal that respondents usually sell raw milk to consumer directly or in dairy and, the respondents had knowledge about processing of milk in form of curd, ghee, khoya making just for household purpose and not for commercial purpose.
- Farm families who have dairy animals do not perform value addition in milk due to lack of self-confidence, lack of time management, lack of training assistance, lack of equipment for processing of milk and lack of storage because milk is a perishable item so it's vital to add value in form of ghee, butter, buttermilk etc to extend the shelf life. Similar results indicated in bee-keeping farming, respondents sell honey in raw form in local market no further value addition performed at secondary and tertiary stage.
- In poultry farming families the respondents have 8-10 egg laying hen and they use eggs for household consumption and not for commercial purpose. There was no value addition observed at primary, secondary and tertiary stage due to lack of knowledge regarding adding value to egg in other form, unwillingness to practice due to involvement of women in domestic chores, lack of equipment, lack of training assistance and lack of time management.
- Farm women role at primary stage reveals that they had no participation in value addition to cereals, pulses, oilseeds and vegetables at primary stage which includes cleaning, drying, sorting etc. independently or jointly with other members because either men of the farm families perform or hire labour for field job whereas, in fruits and beekeeping farm women who were part of SHG (self help group) performing primary stage activity independently and jointly with other members whereas, in dairy all the respondents of farm families who owns dairy animals perform milking activity at primary stage.
- Farm women role at secondary stage reveals that respondents of farm families who were part of SHG (self help group) were involved in value addition of wheat, in cereals followed by kinnow and plum in fruits jointly with other members at secondary stage. Whereas, no value addition performed in other farm produce due to lack of knowledge, lack of time management, lack of equipment, lack of training assistance and lack of self-confidence.

- The overall findings reveal that at tertiary stage farm women of SHG (self help group) participated in value addition of mango, plum and garlic in form of pickle and squash making. The respondents of SHG (self help group) were trained in value addition process as compare to non- SHG farm women because of lack of marketing skill, lack of self-confidence, lack of training assistance.
- The findings reveal about the constraints faced by the farm women in value addition, technically majority (90.83%) of the respondents faced lack of knowledge followed by personal constraint 85.33 per cent showed unwillingness to practice manually due to involvement of women in domestic chores and poor health issues. Whereas, in infrastructural constraint respondents had lack of cold chain facility problem (94.16%) and majority (91.66%) in miscellaneous category faced problem related to lack of training opportunity.

Women act as major contributor to the family food and economic security. On the basis of the above findings, it can be concluded that farm women who were member of SHG (self help group) had knowledge regarding value addition of farm produce and skilled in marketing sector as compare to non- SHG farm women the reason behind it was lack of knowledge, unwillingness to participate, lack of family support, lack of self-confidence to start their own startup in value addition to their farm produce and lack of marketing skill.

IMPLICATIONS

1. The study provides the information regarding the existing status of value addition to farm produce, determination of the role of farm women and the constraints faced by farm women.
2. It can be helpful in formulating various value addition programs and training for farm women.

SUGGESTIONS FOR FUTURE STUDY

1. Similar study can be conducted in other districts of Punjab state.
2. A comparative study can be conducted between rural women and urban women involvement in value addition process.
3. Self-help groups effectively play role in emancipates women farmers to practice value addition to farm produce.
4. Training programmes should have flexible hours for women farmers and women extension workers should train women farmers.

LIMITATIONS

1. The study was conducted only on 120 rural farm women who were belonging to four villages of Ludhiana block of Ludhiana city and as such the results may not apply to population at large.
2. The study was based upon the response given by the respondents.
3. The study was limited to those families who owned farming land.

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ANNEXURE- I

INTERVIEW SCHEDULE

ROLE OF FARM WOMEN IN VALUE ADDITION TO FARM PRODUCE

PART I

SOCIO-PERSONAL AND ECONOMIC PROFILE

| A. RESPONDENT PROFILE | | | | | | |
|--------------------------------------|------------|---------|---------|---------------------|----------|---------------|
| Name of respondent | | | | | | |
| Address | | | | | | |
| Contact No. | | | | | | |
| Age (years) | | | | | | |
| Marital status | Single | | Married | Divorced | Widow | |
| Education | Illiterate | Primary | Matric | Higher Secondary | Graduate | Post-graduate |
| B. FAMILY PROFILE | | | | | | |
| Family caste | General | | SC | ST | OBC | |
| Family type | Nuclear | | | Joint | | |
| Family size (no. of members) | | | | | | |
| Family annual income (in rupees) | | | | | | |
| C. OPERATIONAL AREA (in acre) | | | | | | |
| | | | | | | |

PART II

**TO STUDY THE EXISTING STATUS OF VALUE ADDITION TO FARM PRODUCE
IN SELECTED HOUSEHOLDS**

| Particulars | Area (acre) | Total Production (unit) | Total Production for sale (unit) | Price of farm produce used directly for sale (rupees/unit) | Production used for value addition (unit) | Price of value added farm produce (rupees/unit) |
|----------------|----------------|-------------------------------|---|--|---|--|
| Cereals | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |

| Particulars | Area (acre) | Total Production (unit) | Total Production for sale (unit) | Price of farm produce used directly for sale (rupees/unit) | Production used for value addition (unit) | Price of value added farm produce (rupees/unit) |
|-------------------|-------------|-------------------------|----------------------------------|--|---|---|
| Pulses | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| Oilseeds | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| Vegetables | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| Fruits | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| Misc. | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |

b. Value addition to farm produce performed by farm women at various stage

| Particulars | | Primary stage | | | Secondary stage | | Tertiary stage | | |
|-------------|---------|---------------|--------|---------|-----------------|--------------|----------------|-------|-------|
| Sr. No. | Cereals | CLEANING | DRYING | SORTING | DRY GRINDING | WET GRINDING | NAMKEEN | LADOO | CAKES |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |

| Particulars | | Primary stage | | | Secondary stage | | Tertiary stage | | |
|-------------|--------|---------------|--------|---------|-----------------|--------------|----------------|-------|-------|
| S. No. | Pulses | CLEANING | DRYING | SORTING | DRY GRINDING | WET GRINDING | NAMKKEE N | PAPAD | LADOO |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |

| Particulars | | Primary stage | Secondary stage | Tertiary stage | |
|-------------|----------|---------------|-----------------|----------------|---------|
| S. No. | Oilseeds | SORTING | OIL CAKES | OILING | NAMKEEN |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |

| Particulars | | Primary stage | | Secondary stage | | Tertiary stage | | |
|-------------|--------|---------------|---------|-----------------|-------|----------------|------|-------|
| S. No. | Fruits | PICKING | SORTING | DRY POWDER | JUICE | PICKLES | JAMS | CHIPS |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |

| Particulars | | Primary stage | | Secondary stage | | | Tertiary stage | | | |
|-------------|------------|---------------|---------|-----------------|-------|-------|----------------|---------|-----|-------|
| S. No. | Vegetables | PICKING | SORTING | DRY POWDER | PASTE | JUICE | KETCHUPS | PICKLES | JAM | CHIPS |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

| Particulars | | Primary stage | | Secondary stage | | | | | | Tertiary stage | | | | | | | |
|-------------|------|---------------|------------------|-----------------|------|--------|------------|--------|------|----------------|-------|----------------|--------------------------------------|------------------|----------|---------|-----------------------------|
| S. No. | Misc | MILKING | HONEY EXTRACTION | ANT OTHER | GHEE | BUTTER | BUTTERMILK | CHEESE | CURD | CREAM | KHOYA | PROCESSED MILK | SPREADABLE FAT (BUTTER/CHEESE/HONEY) | READY TO EATMEAT | PICKLING | CANDIES | BEVERAGES (WINES/MEAD/BEER) |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |

PART III

TO DETERMINE THE ROLE OF FARM WOMEN IN VALUE ADDITION

| Particulars | Primary stage | | | Secondary stage | | | Tertiary stage | | |
|----------------------|---------------|---|---|-----------------|---|---|----------------|---|---|
| | I | J | N | I | J | N | I | J | N |
| Cereals | | | | | | | | | |
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| Pulses | | | | | | | | | |
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| Oilseeds | | | | | | | | | |
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| Vegetables | | | | | | | | | |
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| Fruits | | | | | | | | | |
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| Miscellaneous | | | | | | | | | |
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| 6. | | | | | | | | | |
| 7. | | | | | | | | | |

I: Independently

J: Jointly with other members

N: No participation

PART IV

TO STUDY THE CONSTRAINTS FACED BY FARM WOMEN IN VALUE ADDITION TO FARM PRODUCE

| Sr. no. | Constraints | Yes |
|-----------|---|-----|
| a. | Technical Constraints | |
| 1. | Lack of technical knowledge regarding process of value addition | |
| 2. | Lack of knowledge about equipments and machines | |
| 3. | Lack of access to technological tool | |
| b. | Personal Constraints | |
| 1. | Unwillingness to practice value addition | |
| 2. | Low self confidence and motivation factor | |
| 3. | Poor health | |
| 4. | Lack of family support | |
| 5. | Shyness from male trainer | |
| c. | Infrastructure Constraints | |
| 1. | Lack of cold chain | |
| 2. | Lack of storage facility | |
| 3. | Lack of equipment | |
| 4. | Poor supply of electricity and water | |
| 5. | Poor transportation facility | |
| d. | Miscellaneous Constraints | |
| 1. | Lack of training opportunity | |
| 2. | Lack of contact with extension workers | |
| 3. | Lack of time management | |
| 4. | Less demand of value added products | |

VITA

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