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Farm-based Sustainable Livelihood Practices under Mahila Kisan Sashaktikaran Pariyojana (MKSP):

A study in two selected States

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U. Hemantha Kumar and Team

ABBREVIATIONS & ACRONYMS	
APC	Agriculture Producer Companies
CADC	Cluster level Agricultural Development Committee
CBOs	Community-Based Organisations
CRPs	Community Resource Persons
DFID	Department for International Development
FYM	Farmyard Manure
GDP	Gross Domestic Product
GECAFS	Global Environmental Change and Food System
HLS	Household Livelihood Security
ICT	Information and Communication Technologies
IDS	Institute for Development Studies
IFAD	The International Fund for Agricultural Development
KVKs	Krishi Vigyan Kendras
LEDs	Light-emitting Diodes
MKSP	Mahila Kisan Sashaktikaran Pariyojana
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
NABARD	National Bank for Agriculture and Rural Development
PADC	Panchayat Agricultural Development Committee
PAPSL	Participatory Assessment and Planning for Sustainable Livelihood
SLA	Sustainable Livelihood Approach
SHG	Self-Help Groups
SHD	Sustainable Human Development
SASHGs	Sustainable Agriculture Self-Help Groups
UNCED	United Nations Conference on Environment and Development
UNICEF	United Nations International Children's Emergency Fund
UNDP	United Nations Development Programme

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EXECUTIVE SUMMARY

Background:

The practices of farm-based sustainable livelihoods envisage promoting sustainable, equitable and decentralised agricultural food systems based on local diversity and participatory democracy through appropriate institution and suitable technologies. This would contribute to improved livelihoods and entitlements, poverty reduction, and long-term ecological and economic sustainability, processes of environmental, economic and social change from the regional and local perspectives, which result in new forms of production exchange, consumption, and governance. To understand its dynamics, a study on Farm-based Sustainable Livelihoods Practices under Mahila Kisan Sashaktikaran Pariyojana (MKSP) was carried out in two States, namely Jharkhand and Karnataka.

Objectives:

The present study is executed with the following objectives:

1. To study the sustainability of farming practices, and
2. To assess the overall impact towards sustainable livelihoods practices

Hypothesis:

1. There is a positive correlation between sustainable income generation from farm-based livelihood strategies of various people and their access to capital asset/s, enhanced skills and appropriate institution.
2. Farm-based sustainable livelihood practices have a positive correlation between people's identity (how they see themselves), perception (how others perceive them), livelihood choices, outcomes and impact.

Study Area:

The study has been carried out in two States, namely Karnataka, and Jharkhand in the year 2016-17.

Methodology and Sampling:

The present study is an inductive research study and designed to generate new information on sustainable farm-based livelihood strategies followed by farmers and agricultural labourers in Jharkhand and Karnataka States of India. In order to capture the essence of strategies, we followed both exploratory and descriptive research strategies to have flexibility in documenting various dimensions of the livelihood strategies. A multi-stage sampling method is used to select the sampling units of the study. We have used following Cochran's formula for determining the study sample size. Accordingly, we decided to include at least 400 sample respondents for this study. We have used random sampling technique to select sample respondents for the study. The respondents from each population were selected by lottery technique.

Variables of the Study:

All the variables of the study are grouped under two categories such as general and context variables. General variables include household demographic variables, household personal variables and household economic variables. Context variables include household livelihood competency, vulnerability status of household livelihood, capitalising capacity building efforts, adoption of improved practices in livelihood and sustainable index of improved livelihood.

Major Findings:

- The livelihood options for the households in study villages expanded over the time. Earlier, majority of the households found their subsistence in labouring works and that trend has changed in recent years. Currently, agriculture, horticulture and backyard poultry are the major livelihoods of the majority of the households in Jharkhand, whereas backyard poultry, horticulture and small ruminant rearing are the major livelihoods for households in Karnataka villages.
- Prior to the capacity building activities, the revenues and income levels of the households were in declining trend and are lower than the long period average in preceding years. Majority of the sample respondents Stated that the unproductive

agriculture land and the lack of scope for agroforestry system were the major reasons for the dwindling revenues and income of the households.

- The households in the study villages of Karnataka and Jharkhand States reported that they have been dwelling their lives with the same livelihood activity for about 23 -28 years. It indicates the household's long-time experience with the current livelihood practices. Because of their persistence in pursuance of their livelihood, it has been duly recognized by the society. Majority of them also perceived their livelihood's relative social value with a higher value. The respondents of the study also highlight that despite due recognition given by the society, over the years, there has been a decreasing trend in terms of social recognition toward their livelihood. And that change rate of declining trend is very high over the years.
- The lack of access to resources, lack of political power, beliefs and customs of households, conflicts and building stock and age were the major reasons that cause such a decline in social value towards the households' livelihoods.
- The means of discharging livelihood operations have been replaced by other methods and technologies. Majority of the respondents Stated that three to four of their livelihood processes have been replaced with other methods or technologies. The replacement process represents either modernisation of the livelihood processes or traditionalisation of livelihood process based on the nature of the case. They perceived that that replacement has led to the obsolescence of their livelihood, which in turn, increases their vulnerability. The intensity of the livelihood obsolescence was at low levels in Karnataka and was at higher levels in Jharkhand. However, all there has been an increasing trend in obsolescence rate of household livelihoods over the years. Majority of the respondents believed that depletion of resources, lack of access to scientific knowledge and lack of access to markets are the major causes in addition to other causes like indebtedness and non-availability of resources for the increase in obsolescence trend.
- The respondents of the study opined that their livelihood has been excluded while implementing the developmental policies and they were not accessed much with livelihood supporting scheme that is being declined in number over the years. They believed that lack of partnership between societies and government institutions, lack of strong social capital, lack of access to financial services, lack of diversification of livelihood and lack of digitalised dissemination of information are the major causes

for such declining trend. Majority of the respondents thought that their livelihood was given low importance by the policymakers while making development framework.

- Household members of the study villages were taken to exposure visits for learning livelihood improvement activities like organic agricultural practices, progressive farmers farming methods, methods in farmers' school and the technologies of demonstration platforms. Majority of the farmers participated in up to three exposure visits that are majorly facilitated by both NGOs and Govt. partnership. The length of the exposure visits of the majority of the Karnataka farmers was between six to eight days, whereas in Jharkhand, it was more than nine days. The utility of such exposure visits in improving household livelihood is at higher levels.
- Over the years, the households' awareness over the institutions has been increased majorly through external assistance that was offered mainly by NGOs in Karnataka study villages and by NGO-Govt. partnership in Jharkhand. The institutions' awareness of the respondents was increased through multi-approach that consists of PRA and FGD and networking methods.
- The enhanced institutional awareness enabled the respondents to develop networks with SHGs, NGOs, Banks, KVKs, Govt. and other village organisations. Majority of the respondents have networked with four to five institutions for satisfying their financial, marketing, training and other general needs. The enhanced awareness has shown a higher utility level in improving the networking ability of the respondents.
- The skill profile of the households in study villages was improved over the years majorly due to external support offered by the NGOs in Karnataka and NGO-Govt partnership in Jharkhand through training and ICT information distribution. Majority of the sample respondents trained for more than 15 days on organic agricultural practices, seed treatment, FYM preparation, vegetable cultivation, animal rearing, marketing and technology usage. The imparted training has shown higher levels of utility in improving livelihood standards of the households in the study villages.
- The capacity of the household was improved by demonstrating various improved practices like organic farming, SRI cultivation, FYM preparation, intercropping, small ruminants rearing, livestock, backyard poultry, kitchen garden, azola, limewater and cow urine. Majority of the households in sample villages were given demonstration over more than five practices that are discussed above through various methods like videos, wall painting, street play, brochures and pamphlets. Majority of the

respondents were given a demonstration of these aspects through four ICT methods. They opined that the ICT demonstration has shown greater utility in improving their livelihood.

- The household capacity building is culminated through the adaptation of improved practices like integrated farming, crop diversification, increase of livestock proportion, use of improved technology, cultivation of horticulture crops, organic farming in Karnataka State and adaptation of integrated farming, organic farming practices and usage of organic fertilizers and pesticides in Jharkhand State. There are more than two practices adopted by every household in study villages of both Karnataka and Jharkhand and most of the respondents believed that the adoption of improved practices has increased their standards of living. The adoption of improved practices has shown greater utility in improving household livelihood in study villages.
- The average size of the landholding that was cultivated by the majority of the household of Karnataka State ranges from 1.5 to 2.0 hectors and it has increased to over 2 hectors. On the other hand, the average size of the landholding that was cultivated by majority of the households of Jharkhand has improved from less than 1.5 hectors to up to 2 hectors.
- The cropping pattern of Karnataka study villages has shifted from staple food predominance to horticulture and commercial crops predominant pattern, whereas the Jharkhand State has shown more or less similar cropping pattern over the period. In Jharkhand, the cultivation of rice, wheat and maize have declined and the consequent increase is observed in the cultivation of SRI-Paddy and vegetable crops. It is evident from the study that there has been a significant improvement in the average area under vegetable crops in both the States; it has increased from 0.4 Ha. to 1 Ha. In Karnataka and 0.7 Ha. to 1.1 Ha in Jharkhand.
- Over the period, as a result of the capacity building and improved agricultural practices, there has been an increase in average production. In Karnataka, the average production of major foodgrain like ragi, red gram, cowpea and horse gram was increased from 15.4 to 31 Quintal/Ha. Similarly, the average production of vegetables has also been increased from 10 to 41 Quintal/Ha. In Jharkhand, the average production of vegetables has shown manifold increase from 17.5 to 86 Quintal/ Ha.
- The average cost of production has increased over the period and huge variation was

observed in the cultivation of vegetable crops in Karnataka, and paddy and vegetable crops in Jharkhand. The cost of production for the vegetable cultivation increased from the Rs.1550 to 2447 per hector in the study villages of Karnataka, whereas in Jharkhand the average cost of production for the cultivation of paddy increased from Rs.40000 to 89227 per hector and for SRI-Paddy it increased from Rs.25000 to 52335 per hector. The vegetables' cost of production in Jharkhand State increased from Rs.3500 to 22000 per hector.

- The average price for the produce has also been increased over the period to compensate for the increase in the cost of production. When compared with Jharkhand, the households of Karnataka State have received higher levels of price for their produce. The significant price increase is observed for horticulture and vegetable crops in Karnataka and vegetable in Jharkhand State. Despite the higher level of prices, the households in Karnataka State have marketed relatively lesser quantities of produce than the Jharkhand households. A significant increase is observed in the marketed produce for the vegetable crops and mixed crops in Karnataka, whereas in Jharkhand, except wheat all other crops have shown a relatively good increase in market quantities. The marketed quantity of vegetables in Jharkhand State has shown a several-fold increase.
- The households in Karnataka study villages have shown a higher level of household consumption of their produce when compared to the household consumption of Jharkhand respondents. Very significant improvement was observed in the household consumption of vegetable in both States.
- Households of the study villages were succeeded in leveraging their enhanced capacity and adaptation of improved practices by way of improving their income levels. The average gross income from various crops has been increased for all crop; a higher level increase was observed in the case of horticulture crops in both States.
- The livelihood of households in study villages have been strengthened with initiative of high yield milk animals. The practice of rearing milch animals is a new concept in the study villages of Jharkhand State. In the study villages of the Karnataka, the yield of milch animals was increased from 5 to 15 litres/day and the mulching days from 117 to 192 days/year and the net income increased from Rs.1604 to 47976 per annum. The annual net income from the milch animals is around Rs.16,300 in Jharkhand State.

- The exposure visits and demonstration sessions enabled the households of the study villages to rear small ruminants like sheep and goats to provide additional income to their subsistence. The household in Karnataka State could earn an average net income of Rs. 18240 per year and Jharkhand farmers could earn an average net income of Rs. 8900 per year.
- Rearing of backyard poultry has also shown a significant improvement in household livelihoods. It adds an additional income of Rs. 12600 for households in Karnataka and 11800 for households in Jharkhand.
- A major portion of the income that was earned by the households in study villages spent primarily on the purchase of subsistence goods, procurement of inputs and debt clearance. An insignificant proportion of the income was incurred to build a permanent asset and very little amount or no amount was left for savings. With the adaptation of improved livelihood practices and increase in income level, more significant amount of income is being spent on the household health needs and creation of permanent assets. On average, 25% of the maximum proportion of the household income in Karnataka and 34% in Jharkhand is being saved to meet future household needs.
- As a result of the capacity building efforts, there has been an increase in total number of household working days for both genders. The number of working days for the female increased from 163 to 292 and for the male from 158 to 278 in the study villages of Karnataka. In Jharkhand villages, the number of working days for the female increased from 166 to 345 and for the male, the working days are increased from 137 to 216. Majority of the working days of the household have been spent on agricultural activities.
- The increase in number of working days is also coupled with the increase in wages. In both States, the wage being received for the non-farm activities is higher than the farm wages and MGNREGA wages. In Karnataka State, the average wage for male and female increased from Rs. 90 to Rs.220 for farming and from Rs. 130 to Rs.300 for non-farm activities. In Karnataka State, the average farm wage for the male increased from Rs.90 to Rs.158 and Rs. 64 to Rs.125 for the female. The non-farm wages for the male increased from Rs. 104 to Rs. 206 and from Rs. 85 to Rs.182 for the female.
- The period of households' migration to other places for work has been declined

significantly in both Karnataka and Jharkhand States. The average migration days of the household is declined from 53 to 16 in Karnataka and 54 to 18 in Jharkhand. There is a complete reduction in the proportion of income that has been spent to clear the debts of households in both States.

- The capacity building efforts and networking efforts have culminated into an increase in access to developmental benefits. Majority of the households in the study villages of Karnataka and Jharkhand have shown improved access to health and sanitation facilities, banking facilities, anganwadi centres, ASHA scheme, farmer facilities, soil health card, insurance, veterinary services and MGNREGS works.
- In both Karnataka and Jharkhand study villages, the variable Adoption Index which shows the intensity of adoption of improved practices by households is showing a very strong positive correlation with the variables like Livelihood Competency Index, Social Capital Index, Agriculture Income Variation, Dairy Income Variation, Small Ruminants Income Variation, Income Variation in Backyard Poultry, Working Days Variation, Farm Wage Variation, Non-Farm Wage Variation, Variation in Migration and Access to Developmental Facilities. Whereas the variable Social Capital Index has shown a moderate positive correlation with all of the study variables except with Adaptation of Index, Dairy Income Variation, Income Variation in Backyard Poultry and Non-Farm Wage Variation.

Suggestion/Recommendations:

Based on the results discussed above, the study eventually has drawn the following policy implications for further efforts for the improvement and replication of farm-based sustainable livelihoods practices elsewhere in the country.

- **Ensuring food and nutritional security for women and children:** The family development plan processes through SHGs have helped to the identification of food and nutrition requirements of the family and means of achieving it. The inbuilt package of practices such as kitchen garden, backyard poultry and rising various horticulture based fruit crops by households have yielded positive results. This has been achieved through modelling, training sessions, demonstrations on high crop intensity vegetable farms, organising women-specific campaigns for food and

nutrition, general health awareness using the forums of the SHGs and FFS by PIAs in respective study areas.

- **Soil and water health improvement**: Capacity development training of Community Resource Persons (CRPs) on trench-cum-bunding in slope area, contour farming, rainwater harvesting, soil health improvements, especially effective microorganisms, mulching, green manuring, and agronomic practices such as jeevamrutha, panchagavya, vermicompost, multiple cropping with crop rotation have helped the farmers through effective digital dissemination of information by CRPs improved the fertility of soil as well as reducing the cost in terms of control of pest by using locally available indigenous pest management practices. This has further stabilised the yield of different crops sustainably.
- **Management and control of seeds:** Training programmes for farmers, especially women farmers, in varietal selection, seed production, seed conservation and seed bank management have made a major positive contribution for successful maintenance of farm-based sustainable livelihoods practices in our study areas. The management and control of seed bank was achieved through the establishment of one community seed bank each at Gram Panchayats by PIAs in respective study areas. The seed bank was functioning on the principle of pay it forward basis.
- **Mitigation of risk of exposure to hazardous farm practices**: Capacity building activities such as digital dissemination information mode on use of botanicals and pheromone traps, ecological approach to pest management using knowledge and skill-based practices to prevent insects from reaching damaging stages and damaging proportions by making the best use of local resources, natural processes and community action have contributed much to reduce risk, costs and thereby improvement in yield.
- **Biodiversity enhancement**: The efforts initiated by PIAs in respective sample study areas through various capacity building measures on seed treatments, use of organic urea, crop diversification and establishment of plant nursery under supervision of village organisation (federation) to raise necessary planting materials for agroforestry, fodder and conservation of biodiversity have yielded positive results towards chemical-free nature-friendly farm-based sustainable livelihoods practices.
- **Use of indigenous knowledge**: It was observed that regular consultative curriculum development workshops with the community (SHGs/VOs) by PIAs to

identify indigenous knowledge, best practices and put into practice rigorously in the villages in our two sample States.

- **Suitability of technology to the local agroecology:** Another effort made by PIA was facilitating the development of integrated farm enterprise planning (backyard poultry, kitchen garden, sheep and goat, piggery, fishery, apiculture and dairy). Extension services including suitable technology through demonstration platforms were also exposed to the farmers from time to time.
- **Resilience to climate change:** Training on aerobic composting to reduce carbon emission, promotion of SRI to reduce methane emission and temperature-tolerant agronomic practices were familiarised. Farmers were mobilised and in tuned to resilience to climate change impacts.
- **Arrangements for post-project sustainability through governance and management**: The following post-project arrangements were observed.
    - Develop the team of CRPs to support the grassroots level CBOs.
    - Training in operations and management of appropriate farm machinery, community assets to meet the shortfall in manpower during critical periods of agriculture
    - Video and print documentation and dissemination of knowledge for replication
- **Financial sustainability**
    - Financial sustainability was achieved through the training and other interactions designed to have strong lines of messaging on self-help to orient and persuade the SHG members to contribute equity to their CBOs for each service to build the corpus of the CBO at different nodes.
    - Financial literacy programmes were aimed at developing willingness and capacity to pay to build the corpus of the CBO
    - Contribution ad valorem by 2 to 3 per cent the users for livestock services, seeds and planting materials, credit linkage entitlements from the government
    - Corpus building by internal lending of the borrowed funds from the bank, revolving fund from the MKSP.
- **Drudgery reduction for women farmers**:

Stringent efforts were also observed towards drudgery reduction.

The main efforts undertaken were

- Exposure and awareness campaigns on drudgery reduction technologies (e.g. smokeless stoves, effective storage of food with local resources, water filtration units, solar energy powered lanterns, LEDs, biogas, pedal-operated pumps, retrofitting batteries to cycles, shelling machines, etc.)
- Building community assets (pulveriser, weeders, dibblers, etc.) managed on a user fee basis.

- **A life cycle approach on gender sensitisation**

The women members of the governance team were strengthened through leadership development, given priority for asset building and centralised in all knowledge sharing.

- **Value chain development**:

Need-based training programmes and support system were developed specifically to high-value potential crop produce, e.g. Brown and liquid jaggery, duram wheat in Raybag, organic milk and milk products, tender coconut water in Gubbi.

- **Incremental income-reduction in costs and increase in returns**
  - Reduction in the cost of cultivation has brought out by increasing the soil productivity, water use efficiency, seed rate, input substitution (seeds, fertilisers, pesticides, water, labour, cattle feed, veterinary medicines), labour use efficiency through share labour.
  - Access to bank finance reduces the borrowed costs
  - Reduction in cost of marketing by fair trade practices in collective marketing
  - Reduction in medical expenses due to improved health having improved nutritional status
  - The high density, diversified farming and agronomic practices were introduced
  - The quality of agro produce with NPM and non-fertiliser usage enhance the quality of produce
  - Additional income due to capital assets such as cattle, small ruminants, fishery, apiculture and irrigation assets.

CHAPTER - 1

1.1 INTRODUCTION

Livelihood is a means of securing basic human necessities like food, water, shelter and clothing for maintaining individuals' lives. Livelihood is defined as a process of securing basic necessities required for individual or household sustenance either through individual abilities or through group efforts by managing human and resource endowments in a dignified and judicial manner. Livelihood is widely referred to as a founding and building material for all professions in the society. One can found various patterns of livelihoods in each profession; all of such livelihoods act synergistically in complementary passion and make the profession to flourish forever.

Over the years, the changing sociological, technological and environmental conditions lead to the structural changes in both natural and social spheres of human life. Some very prominent professions in the past have become obsolete in current conditions. On the contrary, once meagre professions have become prominent in present conditions. This phenomenal shift was occurred due to the weakening or modification of livelihood options in each profession. The transition of agriculture during the last century and in recent years is exemplary evidence for this phenomenon.

The agriculture profession has been a compendium of various livelihoods ranging from cultivation to animal rearing to labouring. Due to climate change and evils of modernisation, agriculture profession and its constituted livelihood lost sustainability. The technological and climatological changes in agriculture question the farmers' ability to find subsistence through agriculture. It is observed that several livelihood options in agriculture profession have been acutely vulnerable to change agents like technology, climate, resource level, demographic patterns, etc. Hence several farm-based professions became obsolete and forced the people to migrate or to change profession. The decline in the relative value of agriculture profession is being manifested in several dimensions in the economy. Over the last decades, the agriculture sector's contribution to the Gross Domestic Product (GDP) is sharply declining; the unemployment rate and poverty level in agriculture community are ever-increasing.

Great emphasis has been shown worldwide by researchers and academia on

'sustainable agricultural livelihoods.' Various models of sustainable agricultural livelihoods were developed and demonstrated around the world to uplift the vulnerability status of the farmers and agricultural labourers. The models focus on developing and promoting locally adapted farming systems, sustainable and ecological farming practices, conservation of ecosystem services, building community institutions and so on to promote sustainable agriculture which can ensure sustainable livelihoods to the marginalised people.

- The other models are ***building community enterprises of small-holders*** to combat poverty and food insecurity among the most vulnerable sections of the society in Chittagong Hill Tracts and Haor region of Bangladesh.
- ***The Yangou watershed (China) experienced a dramatic improvement of the human-land system*** including farmers' vulnerabilities, livelihood assets, strategies, outcomes, and the environmental indices since agricultural practices were implemented. These practices included building terraces, returning sloped farmlands to forest and grassland, and expanding orchards. The vulnerabilities of farmers to shocks have been dramatically reduced by the improved environmental indices and the enhanced per capita net income. The positive and significant impacts of new agricultural practices on the sustainable rural livelihoods of the Yangou watershed are evident and essential to the sustainable rural development of the watershed. The enhanced income, improved environmental indices, and reduced vulnerabilities of farmers are recognised as new livelihood assets that will influence the future livelihood strategies in the holistic framework. It is concluded that reduced dependence n the grain and subsidies income and diversified livelihood strategies are essential to sustainable rural development of the Yangou watershed.
- The '***Green Colleges' train rural Youth in green trades***, combining traditional wisdom with scientific techniques to help become 'entrepreneurs' and to enable them to have better access to technology, finances and market.
- The ***Sustainable Integrated Farming Systems programme*** supports farmer groups to transform into more productive and sustainable systems.
- The National Bank for Agriculture and Rural Development (NABARD) has been supporting various welfare projects for scheduled tribes in the country under

its Tribal Development Fund. The Wadi project is one such integrated tribal development initiative of NABARD. The main features of a Wadi model are economic upliftment of the farmers through sustainable agriculture, social empowerment and improvement in the quality of life, including health and women empowerment in tribal-dominated areas of the country. The broad interventions are in the areas of land-use planning, soil and water harvesting measures and improved farming-based agroforestry practices. Therefore, Wadi not only strengthens the agrarian livelihoods of the tribal households but also increases food and nutritional security.

Such time-tested models are needed to be adopted and implemented in other regions of the world to benefit mankind. Despite the vulnerable conditions that prevail in the country, some of the Indian peasants in various regions were able to evolve farm-based agricultural livelihoods to sustain their lives from vulnerabilities like drought, cyclones, famines, etc.

- Environmentally sustainable agricultural models do exist and have proved their effectiveness. Low-cost techniques, which are accessible for smallholder farmers, have now been successfully tested on a large scale. Knowledge has increased in leaps and bounds in recent years, be it agroforestry, fertilization practices using biomass, or plant and livestock breeding. New information technology, financial services directed towards smallholder farms, and the expansion of regional markets are all creating new opportunities for family farms.
- Investing in thousands of smallholder farms would appear to be a complex and uncertain gamble. It is therefore essential to develop investment mechanisms that are both suited to the peculiarities of family farming and are able to support large-scale projects. Unlike "classic" funds, these funds put a financial value on the direct or indirect "externalities", or benefits, generated by the projects such as volume and quality of agricultural production, water resources management, increased biodiversity, carbon storage, social impact, etc.
- Even more than the investment itself, the method is important: no single stakeholder – be it a company, NGO, farmers' cooperative or public organisation – has the solution on his or her own, but each has a vital role to play in contributing to the solution. Today, coalitions of diverse stakeholders are working

together to achieve well-defined goals in the field of family farming. The essential principle driving their models is that the farmers are and will be the main drivers of this transformation.

- **Sustainably transforming supply chains**

The huge diversity in agricultural practices and agro-climatic conditions of the Indian continent made the farmers develop or modify their agricultural practices to reciprocate the changes in the socio-economic and physiological environment of the country. The inherent adaptable capacities of Indian farmers were further strengthened with the external assistance provided by voluntary associations who have been the source of international technical know-how in various regions of India.

Vrutti in association with Centre for Indian Knowledge Systems has been implementing a project entitled 'Poverty reduction through sustainable agriculture in southern India.' The overall goal of the project is to contribute to reduce poverty and hunger and help achieve MDG 1 in India. The project aims to increase the income of 9000 small-holder agriculture households through a farmer-led social enterprise model. Agriculture is increasingly becoming non-remunerative for these households due to a variety of reasons, including low productivity, increased cost of cultivation, poor access to services and fluctuations in market prices.

The project aims to deliver a package of seven direct interventions such as home gardens, full package of organic practices, provision of quality seeds and fertility improvement products, provision of bio-pesticides, market information and linkages, value addition, and allied activities like backyard poultry. The institutional model designed for the for these services delivery are

- Village Based Agriculture Business Development Service Providers (**VABDSPs**) in each Panchayat
- Sustainable Agriculture Self-Help Groups at the village level (**SASHGs**)
- Their apex bodies at Panchayat - Panchayat Agricultural Development Committee (**PADC**) and Cluster level Agricultural Development Committee (**CADC**)
- Agriculture Producer Companies (**APC**) at the district level.

APCs can become self-sustaining social enterprises operating on business principles. It is in this context the present study is executed to identify and study such farm-based sustainable livelihood practices observed in Jharkhand and Karnataka with the view to exploring its suitability to renovate and redeploy them in other parts of the country.

1.2 Review of Literature and Conceptual Framework of the Study

Livelihoods are the ways in which people satisfy their needs, or gain a living (Chambers and Conway, 1992). How rural people make a living and whether their livelihood is secure or vulnerable over time are issues covered in livelihood literature. Livelihoods turn up from a variety of sources and activities, which vary over time. They comprise several different activities for each given household - more often than not even for each working member, which may change even within a year. Flexibility of households' livelihoods determines the type of strategies that rural households adopt to make it secure and how they respond to changes. Although some households adopt strategies relying mainly on few activities, most of them adopt strategies that are complex, diverse and versatile (Chambers, 1989). The livelihood strategies are the sum of all different activities that people do in the context of their livelihood, and are based on the access to and combination of five forms of capital assets namely, human capital, natural capital, financial capital, social capital, and physical capital (Sconner, 1998; Bebbington 1999)

The concept of 'sustainable rural livelihoods' is increasingly central to the debate about rural development, poverty reduction and natural resources management. The definition of sustainable livelihood is a livelihood comprising the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base (Chambers and Conway, 1992).

Sustainable livelihoods are a systemic and adaptive approach that links issues of poverty reduction, sustainability and empowerment processes (e.g., participation, gender empowerment, and good governance). The attractiveness of sustainable livelihood lies in

its applicability to different contexts, situations of uncertainty and its capacity as a consultative and participatory process for the cross-fertilization of ideas and strategies between various stakeholders. Those living in extreme poverty and outside the formal labour market, for example, constantly improvise their livelihood strategies due to high uncertainty and limited options. A subsistence farmer in the off-season or during drought becomes a wage labourer and could later revert to farming when it is time to plough the field. In a similar vein, we find that job security in the traditional sense seems to be decreasing in the modern/formal/urban sectors and people are changing jobs several times in their lifetime. The sustainable livelihood approach has the flexibility to tap into such kinds of adaptive responses and utilise them as entry points for policymaking.

The activities are usually carried out repeatedly. For instance, a fisherman's livelihood depends on the availability and accessibility of fish. The concept of sustainable livelihood (SL) is an attempt to go beyond the conventional definitions and approaches to poverty eradication. These had been found to be too narrow because they focused only on certain aspects or manifestations of poverty such as low income, or did not consider other vital aspects of poverty such as vulnerability and social exclusion. It is now recognised that more attention must be paid to the various factors and processes which either constrain or enhance poor people's ability to make a living in an economically, ecologically, and socially sustainable manner. The sustainable livelihood concept offers a more coherent and integrated approach to poverty. The sustainable livelihood's idea was first introduced by the Brundtland Commission on Environment and Development. The 1992 United Nations Conference on Environment and Development expanded the concept, advocating for the achievement of sustainable livelihoods as a broad goal for poverty eradication.

1.2.1 Components of the Livelihoods Framework

As livelihoods are determined by multiple factors, a combination of different types of information is needed to understand them. This information includes:

1. Vulnerability context
2. Livelihood resources or assets
3. Policies, institutions and processes
4. Livelihood strategies
5. Livelihood outcomes or goals

1.2.2 Determinants of Livelihoods

There are numerous initial determinants of livelihood strategy. Many livelihoods are largely predetermined by accident of birth. Livelihoods of this sort may be ascriptive in village India; children may be born into a caste with an assigned role as potter, guide, or washer people. Gender as socially defined is also a pervasive ascriptive determinant of livelihood activities. Or not necessarily in ascriptively, a person may be born, socialised and apprenticed into an inherited livelihood – as a cultivator with land and tools, a pastoralist with animals, a forest dweller with trees, a fisherperson with boat and tackle, or a shopkeeper with shop and stock; and each of these may, in turn, create a new household or households in the same occupation.

Many livelihoods are also less singular or predetermined. Some people improvise livelihoods with degrees of desperation, what they do being largely determined by the social, economic and ecological environment in which they find themselves. A person or household may also choose a livelihood, especially through education and migration. Those who are better off usually have a wider choice than those who are worse off, and a wider choice is usually generated by economic growth. In a future of accelerating change, adaptable capabilities to exploit new opportunities may be more needed.

1.2.3 Livelihoods and Vulnerability

Vulnerability has been defined in several different ways. For example, Chaudhuri et al. (2002) defined vulnerability, as the "ex-ante risk today that a household will, if currently poor, remain poor, or if currently non-poor will fall below the poverty line next period." There is now a shift in focus from measuring poverty as a fixed non-dynamic concept to an understanding of issues of vulnerability among rural households (see Moser, 1998; World Bank, 2001; Quisumbing, 2002; Alayande, 2002; Alayande and Alayande, 2004). Notwithstanding all the different definitions put forward to underpin a conceptualisation of vulnerability, it is clear that the term vulnerability deals generally with the problems of household's poverty, risks and uncertainty (Blaikie et al., 1994; Ellis, 2000; Oni and Yusuf, 2007). Other authors have tended to distinguish between the concept of household livelihood vulnerability and poverty in both academic discourse and the field of development. It is argued that vulnerability is in part, different from poverty

since the concept of poverty is an 'ex-post' measure of a household's well-being, while vulnerability is an 'ex-ante' analysis of a household's well-being (Chaudhuri, 2003). However, there is an existence of a conceptual linkage between poverty and vulnerability. Accordingly, Bidani and Richter (2001) opined that changes in vulnerability are also most of the time consistent with poverty trends. For example, when the vulnerability of different parts of the population group is to be assessed at the present and in the future, household's vulnerability may be seen as the likelihood that the household will experience poverty in the near future (Chaudhuri, 2003).

Vulnerability refers to both exposures to unfavourable developments like rainfall failure, or livestock loss that would cause considerable harm to one's livelihood; as well as the lack of means to cope with the loss without losing the household's livelihood base (Chambers, 2006). Various studies have shown that risks and shocks can perpetuate poverty and aggravate vulnerability by inducing asset sales and through lost income (Dercon, 2004, Dercon, 2005a, 2005b). In particular, climate variability is known to cause severe impacts on livelihoods that are sensitive to climate change, such as rain-fed agriculture (Adger et al., 2003; Vogel, 2005; Yamin et al., 2005). Farmers are known to practise different adaptive strategies to minimise the effect of climate variability and to enhance and maintain the quality of their land, but such endeavours are dependent on access to resources (Mortimore and Adams, 2001; Adger and Vincent, 2005).

The interlinked concepts of risk, vulnerability, and human security have become dominant themes of ongoing academic debates on sustainable livelihoods and rural dynamics (Moser, 1998; Delor and Hubert, 2000; Brauch, 2005; Knutson and Ostwald, 2006). As a mixed and dynamic phenomenon, the concept of vulnerability is rather difficult to grasp. The classical definition of Chambers (1989) still provides the most comprehensive approach to encompassing its most critical elements. Chambers defined vulnerability as a combination of defencelessness, insecurity, and exposure to risk, shocks and stress. Here, vulnerability refers to exposure to contingencies and stress, and difficulty in coping with them. Vulnerability thus has two sides: an external side of risks, shocks, and stress to which an individual or household is subject; and an internal side: defenselessness, meaning a lack of means to cope without damaging loss. It is the uncertainties in daily life that are affecting people's well-being (Delor and Hubert, 2000).

There is a close linkage between livelihoods and vulnerability. Understanding the nature of vulnerability and risk is a key step in sustainable livelihoods analysis. Rural people's livelihoods depend on their livelihood assets. These assets are poverty-reducing factors that gain meaning and value through a prevailing social, institutional and policy environment. This environment also affects the livelihood strategies that people use to achieve beneficial livelihood outcomes. The wider availability of assets is fundamentally affected by different (external) factors of vulnerability over which they have limited or no control (DFID, 2001; and Hobley, 2002). Vulnerability may result from poverty, marginalisation and exclusion, and it is generated by social, cultural, economical and political processes (Barnett, 2001). It may affect the well-being of individuals, households and communities in the face of social, cultural and environmental change and how people respond to and deal with such negative change (Moser, 1998; and Obrist, 2000). While it is usually negative, it can also provide positive opportunities (Adato and Meinzen-Dick, 2002). Fraser et al. (2005) discuss how to determine the vulnerability of a food system. They claim that food systems are so complex, and include so many variables that some scholars have moved away from trying to predict the future of global food security, focusing instead on the adaptive capacity of individual communities. However, they argue that this approach also generates a long list of variables – social, economic, political and environmental so that it may not be useful in developing policymaking tools.

Rahman and Alam (2001) conducted a baseline survey on livelihood security of vulnerable urban households in slums and low-income settlements within the municipal areas of Jessore and Tongi cities in Bangladesh. The researchers highlighted that the incidences of divorce, separation, abandonment and being a widow are strikingly high in the female-headed households in both cities, thereby the vulnerability of female-headed households require broader family support for their livelihood security.

Mutangadura and Markaudze (1999) investigated the urban vulnerability to income shocks and the effectiveness of current social protection mechanisms. The study identified idiosyncratic shocks as unemployment, retrenchment, death in the family, long illness and divorce, and covariant shocks as general price increases devaluation, taxes and droughts. Also, the study reported a number of coping up strategies such as reduced consumption, switching to cheaper substitution, child labour and subletting.

Erickson (2006), who examined the vulnerability of food systems to global environmental change, further distinguishes between adaptive capacity and coping capacity. Coping capacity is the understanding that people need more than access to resources but active strategies to manage them in the face of risk. It is most meaningful when it is used to represent short-term responses (such as selling a cow or reducing the number of meals) to ensure survival in the near future. By contrast, adaptive capacity is meant to imply long-term changes in the behaviour and livelihood strategies to ensure the maintenance of income or food security for the foreseeable future. Generally, adaptive capacity suggests an ability to respond to shocks in the future; coping capacity today may include attributes that will lead to a system's adaptive capacity.

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Ericksen (2006) assesses future vulnerability you have to predict climate-related risks and what people are doing to cope with them. By examining past response and having community identify future adaptation options and constraints, researchers can characterise a community's ability to cope with future changes and collaborate to identify adaptive strategies that will reduce risk. However, it is necessary to keep in mind that vulnerability is scale-dependent, that indicators at a household level will be different to indicators at a community or regional level. Things can be secure at national, regional or community level, while someone is vulnerable at an individual level. This raises complex institutional issues such as how do you target interventions to reduce vulnerability at all levels.

The study by **Stephen Devereux et al. (2007)** explored the nature of vulnerability, such as agriculture vulnerability, economic vulnerability, monetary and subjective indicators of vulnerability in Malawi. Policy priorities derived from this analysis include stabilise food prices, enhance access to agricultural inputs, and identify labour-

saving technologies for labour-constrained households. More generally, social protection and livelihood promotion measures, together with an enabling environment, are central to addressing vulnerability in Malawi.

Sanjeev Kapoor and Raj Kumar Ojha (2004) have studied the vulnerability in rural areas to a broad range of risks and crises that directly affect its livelihood. These risks directly affect the level and sources of income and productive assets of these households. The study aimed to identify the most common risks and crises that rural households face, ways and means of households' response to such crises and risks, and potential demand for microinsurance in rural areas. Although the study identifies a variety of risks and crises that are faced by rural households in Uttar Pradesh, death, sickness, agriculture and livestock-related shocks are ranked high not only in terms of financial pressure experienced by the poor but also in terms of their frequency of occurrence. The study argues that there is a clear demand for providing the poor with insurance services to help them better manage risk both ex-ante and ex-post. The lessons of microcredit products should be extended to insurance products also.

Sarah and Mehrul (2004) stated that several components of health security are considered to be critical in livelihood security assessment. The first is the frequency of illness among all household members. In highly vulnerable households, illness episodes can severely compromise the productiveness of family members, reducing already-low levels of incomes and production, thereby affecting food and nutritional security. The second component is access to primary healthcare. The health security of rural families is directly related to their level of access to appropriate medical care.

Causes of Vulnerability

- Food insecurity
- Lack of assets and secured access to natural resources
- Lack of skills, access to basic minimum services and economic opportunities
- Lack of governance
- Continuous degradation of natural resources due to deforestation and mining

- Fodder reduction and cultivable land availability
- Reduction in soil fertility
- Low productivity
- Drudgery increases
- Frequent drought
- Lack of financial accessibility
- Inadequate employment and wages
- Social stigma
- Lack of identity

1.2.4 Coping Mechanisms/Diversification

Why should the households attempt to diversify their livelihood strategies? The purpose of diversification is two-fold: first, to increase household incomes; and second, to minimise the risks of livelihood failure. Diversification reduces the risk of livelihood failure by spreading it across more than one income source. It also helps to overcome the uneven use of assets caused by seasonality. Diversification assists to reduce vulnerability, generate financial resources in the absence of credit markets, and confers a host of other advantages in the presence of widespread market failures and uncertainties. Broadly, the rationale for diversification emanates from the opportunities for more employment and generation of higher incomes through more efficient use of resources and exploitation of comparative advantage (World Bank, 1990). Diversification is a core strategy of contemporary rural livelihood systems in developing countries (Ellis, 2000). In reality, rural households' resource allocation decisions are fundamentally constrained by conditions of livelihood asset endowments and related socio-political and institutional factors. Households may choose to adopt various strategies to secure their livelihood. They may be classified as the ex-ante risk coping mechanisms adopted by the households like crop diversification, varietal diversification, income diversification, livelihood diversification, etc., and the ex-post mechanisms, such as the reduction in consumption expenditure, selling of animals, implements and other assets, increase in the use of family labour and distress sale of assets to cope with losses. Thus, it is worth mentioning that the adoption of coping mechanism leads to the improvement in the standard of living of the households. Livelihood diversification (or occupational diversification or off-farm diversification we use the terms interchangeably), is one of the

most remarkable characteristics of rural livelihoods. It is defined as "the process by which rural families construct a diverse portfolio of activities and social support capabilities in order to survive and to improve their standards of living" (Ellis, 1998).

In the chase of livelihoods, rural households diversify their income sources, while at the same time adopting strategies that increase production, avoid or minimise harvest loss and increase their access to key resources. Farm activities comprise crop and livestock production and the income derived from the same. Farmers usually diversify on-farm activities to meet their consumption and marketing needs. Widening income sources by engaging in diverse off-farm and non-farm activities is essential as farming alone fails to provide an adequate means of survival (Ellis, 2000). Off-farm income includes wages or payment in kind obtained by working on other farms and income from the sale of natural resources, while non-farm income includes income from non-agricultural sources, such as petty trading, rural nonfarm employment, handicrafts, public support and remittances (Ellis, 2000).

It is important to note that farm, off-farm and non-farm activities complement each other. Farm income can provide the capital needed to initiate and expand non-farm activities, while off-farm and non-farm activities can contribute to farm productivity by providing finance for farm input purchases and investment (Reardon et al., 1994). Similarly, failure in one category of activity can have a negative impact on other types of livelihood activities. In addition to diversification, households also engage in adaptation activities in order to enhance prevailing security and wealth, or to reduce vulnerability and poverty (Davies and Hossain, 1997). This involves activities such as enhancing land and soil quality, adopting drought-tolerant and fast-maturing crop varieties, spreading risks by diversifying income sources, increasing access to resources, entering into formal and informal risk-sharing arrangements and building family and kin support bases. However, it is important to note that the capacity to adapt and diversify is differential, varying from household to household depending on factors such as asset ownership, access to credit and inputs, infrastructure development and availability of alternative opportunities.

Rural livelihoods are often vulnerable to risks and shocks. Climate variability, human and livestock diseases, pests, flooding, unfavourable market trends, institutional

deficiencies and so on can present risks and inhibit livelihood endeavours. Livelihood adaptation, vulnerability and resilience – the ability of a livelihood to be able to cope with and recover from stresses and shocks is central to the definition of sustainable livelihoods. Such resilience in the face of stresses and shocks is key to both livelihood adaptation and coping (Davies, 1996). Those who are unable to cope (temporary adjustments in the face of change) or adapt (longer-term shifts in livelihood strategies) are inevitably vulnerable and unlikely to achieve sustainable livelihoods. Assessing resilience and the ability to positively adapt or successfully cope requires an analysis of a range of factors, including an evaluation of historical experiences of responses to various shocks and stresses. Different types of shock or stress, in turn, may result in different responses, including avoidance, repartitioning, resistance or tolerance mechanisms (Payne and Lipton, 1994).

Mutonodzo (2006) examined the coping strategies with limited food, insufficient income, and expenditure reduction in urban households in Harare. The study revealed that about 71 per cent of the households conserved expenditure by regularly reducing the number of meals taken per day and rationing quantities of food eaten per meal was the next important strategy employed by 66.8 per cent of the households. About 60 per cent of households conserved expenses by eating less preferred foods and borrowing food were the strategies of last resort with 40 per cent of households. Income-related strategies included diversification, temporary migration in search of alternative income sources and casual labour. The researcher further observed that shock with the greatest score was the general increase in prices and other shocks included operation restore order, payment school fees, medical care and services.

Dunn and Valdivia (1996) make an important distinction between ex-ante strategies of income diversification, which help to reduce households' exposure to shocks, and ex-post coping strategies to offset the effects of shocks after they occur. They argue that in Andean semi-arid regions, households with more opportunities for an ex-post adjustment (greater assets in the form of livestock), have fewer incentives for ex-ante risk-reducing strategies.

1. **ex-ante** coping mechanisms include
    - Diversification of crops
    - Relying on non-farm activities
    - Investment/disinvestment in irrigation and fertilizers
    - Accumulation of assets
    - Purchase of crop or weather insurance
    - Arrangement to share with family
    - Sharecropping
    - Diversification of income sources
2. **ex-post** coping mechanisms include
    - reducing inputs for production
    - changing crops
    - depending upon irrigation
    - buying or selling assets
    - receiving or providing transfer
    - seeking non-agricultural employment
    - migration

However, these coping mechanisms again differ from one region to another and also among the class structures. For example, the coping strategies of the large landholders vary from that of the small or marginal landholders. These coping mechanisms again have some opportunity cost involved. For example, the cultivators can shift from superior crop cultivation to inferior or traditional crop varieties; but that, in turn, reduces the income of the cultivators compared to the normal year, compared to the cultivators in other areas. These coping mechanisms often reduce the capital investment of poor farmers. Again, the poor backward farm households depend upon some non-market institutions for the credit to cope with drought. However, these are very costly, and this affects the long-term income growth of the farm households. Thus, these coping mechanisms adversely affect the asset creation of backward households and push them into poverty.

Frank (1999) examined livelihood diversity in developing countries. He revealed that gender was an integral and inseparable part of rural livelihoods and men and women have different assets, access to resources and opportunities. Women rarely owned land

may have lower education, discriminating access and their access to productive resources as well as decision-making tend to occur through the mediation of men. Women typically confronted a narrower range of labour markets than men and lower wage rates. Therefore, diversification was more of an option for rural men than women. The diversification can improve household livelihood security while at the same time trapping women in customary roles.

Koriya (2008) developed a detailed typology of livelihood and diversification strategies adopted by fishers. It draws on the strength of the fisheries sector in supporting the livelihood of different stakeholders as well as the asset base of fishers which enables them to diversify and also assess the sustainability and equity implications of the choices using a range of indicators based upon DFID's Sustainable Livelihood Framework on various livelihood issues concerning coastal fishing communities in India.

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Turton (2001) affirms this view when he emphasises the need for indicators that relate to context. In one project in Nepal, it was difficult to develop indicators due to the diversity of livelihoods, caste and ethnic groups, even the difference in poverty aspects across geographic regions. There is a sense that there should be some common core indicators found in every report but no one is sure what they should be - report prefers locally specific indicators rather than magical generic livelihood indicators.

Frank Ellis (1999) studied the livelihoods diversification as a survival strategy of rural household in developing countries and the status that diversity is closely allied to flexibility and stability of natural capital, human capital, physical capital, social capital and financial capital. The paper suggests that the practical application of the sustainable livelihoods framework needs to place diversity high on policy agenda and recognised the benefits of diversity.

1.3 Sustainability

The sustainability of livelihoods raises many questions. These fall into two groups: whether a livelihood is sustainable environmentally, in its effects on local and global resources and other assets; and whether it is sustainable socially, that is, able to cope with stress and shocks, and retain its ability to continue and improve. Sustainability is thus a function of how assets and capabilities are utilised, maintained and enhanced so as to preserve livelihoods. Environmental sustainability concerns the external impact of livelihoods on other livelihoods; social sustainability concerns their internal capacity to withstand outside pressures.

1.3.1 Environmental Sustainability

Most conventional thinking equates sustainability with preservation or enhancement of the productive resource base, particularly for future generations. This can be separated into two levels. The first level is local. The question here is whether livelihood activities maintain and enhance, or deplete and degrade, the local natural resource base. This is the familiar focus on visible aspects of sustainability. On the negative side, livelihood activities may contribute to desertification, deforestation, soil erosion, declining water tables, salinisation and the like. On the positive side, livelihood activities can improve the productivity of renewable resources like air and river water, soil, organic soil fertility and trees.

The second level is global. The question here is whether environmentally livelihood activities make a net positive or negative contribution to the long-term environmental sustainability of other livelihoods. This is the now familiar, but less visible, focus on issues such as pollution, greenhouse gases and global warming, the ozone layer, the irreversible

use of the world's store of non-renewable resources, and the use of sinks (such as the sea for carbon dioxide) for pollution emissions (Agarwal & Narain, 1991).

To this thinking on sustainability which is concerned with tangible assets, we would add the notion of preservation or enhancement of intangible assets. Livelihood activities can be regarded as environmentally unsustainable if they have a net negative effect on the claims and access needed by others. Claims and access can be diminished in several ways, including by law, by force, or by bureaucratic barriers. Examples of negative effects on claims and access to resources at the local level are their erosion or loss through appropriation and exclusion by the powerful. The livelihoods of the powerful gain, but there are net losses.

At the global level, livelihoods are threatened by international trade and other agreements that reduce claims and access to global markets for livelihood products and to global common properties, for example to ocean fisheries. The pervasive links between the global and the local levels (Davies & Leach, 1991) are important and easily overlooked.

1.3.2 Social Sustainability

In terms of equity, the environmental sustainability of livelihoods has to be complemented by the social sustainability of all livelihoods. Social sustainability refers to whether a human unit can not only gain but maintain an adequate and decent livelihood. This has two dimensions - one negative and one positive. The negative dimension is reactive, coping with stress and shocks; and the positive dimension is proactive, enhancing and exercising capabilities in adapting to, exploiting and creating change, and in assuring continuity.

- **Coping with Stress and Shocks**

The livelihoods and survival of human individuals, households, groups and communities are vulnerable to stresses and shocks. Vulnerability here has two aspects: external, the stresses and shocks to which they are subject; and internal, the capacity to cope (IDS, l989). Stresses are pressures which are typically continuous and cumulative,

predictable and distressing, such as seasonal shortages, rising populations or declining resources, while shocks are impacts which are typically sudden, unpredictable, and traumatic, such as fires, floods and epidemics (Conway, 1987; Conway & Barbier, 1990). Any definition of livelihood sustainability has to include the ability to avoid, or more usually to withstand and recover from, such stresses and shocks.

Examples of livelihood stresses which build up gradually are declining labour work available, declining real wages, declining yields on soils which degrade through salinsation, acidity or erosion; declining common property resources, and having to go further and spend longer for less, for fuel, fodder, grazing or water, declining water tables, declining rainfall, population pressures on resources leading to declining farm size and declining returns to labour, ecological change leading to lower bio-economic productivity, indebtedness; physical disabilities like river blindness, the effects of which build up gradually affecting the whole household (Evans, 1989) and the domestic cycle with its periods of high ratios of dependents to active adults.

- **Dynamic livelihood Capabilities**

Social sustainability of a livelihood also depends on positive and dynamic competence, the ability to perceive, predict, adapt to, and exploit changes in the physical, social and economic environment. This aspect of sustainability has been recognised in agriculture in the work and writing of Roland Bunch (1985; 1988; 1989). In this approach, small farmers are enabled to improve their own experimentation, to conduct their own extension, and to organise to manage and exploit links with the wider economy. Awareness, experimental innovation, and adaptability contribute to dynamic capabilities. Through these, a farm family's livelihood can become more sustainable in uncertain and changing conditions where markets and prices fluctuate, and where old opportunities shrink and new ones appear and expand.

1.3.3 Intergenerational Sustainability

The social sustainability of a livelihood also involves maintaining and enhancing capabilities for future generations. This intergenerational sustainability can be direct or

indirect. In its direct form, intergenerational sustainability takes the form of the inheritance of assets and/or skills: land or the tools of a trade are passed on to the next generation; skills and knowledge are transmitted from parents to children through family apprenticeship. In its indirect form, intergenerational sustainability is achieved through children moving to other places or into other occupations. There they find or create new livelihoods which may be the same or different from those of the earlier generation. To enhance this form of sustainability, households often invest in education and the acquisition by children of skills other than those available within the household. As rural populations rise, farm sizes diminish and change accelerates; so, dynamic livelihood capability and inter-generational sustainability become more critical.

1.4 Sustainable Livelihood Strategies

Nelson (2007) evaluated the livelihood strategy for people of all social classes in the peri-urban zone. However, because the peri-urban zone is one of transition from rural to urban and urban to rural, it tends to undergo more pronounced changes in Land-use over time than do the city and rural area it borders, examines recent changes in agriculture, Land-use and livelihoods. This paper argues that structural adjustment policies and changing land tenure regimes are impacting the presence and 2.7 million cubic metres of sediment to waterways such that by 2050 more than 416,000 ha of agricultural land will be rendered unproductive due to erosion.

Corbett (1988) classifies the strategies into precautionary strategies – the strategies that households use in response to repeated exposure to the same type of non-acute risk, and crisis strategies - strategies to cope with an unusually severe threat to food security. A key argument in coping strategy literature is the sequence in which households take certain strategies according to levels of distress.

According to **Frankenberg (1992),** when households suffer shocks such as the floods, they do not remain passive but employ several coping strategies. These coping strategies are fallback mechanisms for when habitual means of meeting needs are disrupted. The first thing households do when they suffer a shock is to attempt to minimise risks and manage losses to ensure some minimal level of sustenance. The

second strategy employed by households in distress is divestment, or the gradual disposal of assets.

Frankenberger (1992) classifies asset disposal as a coping strategy into several phases, with liquid assets such as jewellery being disposed of first and productive assets later. When productive assets are disposed of, it becomes more difficult for the person or household to return to a pre-crisis state. Finally, the household or individual may embark upon distress migration, which is a sign of failure to cope with the crisis. In summary, the coping strategy literature suggests that there is a general sequence of different types of strategies that households adopt sequentially as stress becomes more prolonged, initially adopting strategies that will not jeopardise future earnings, and only resorting to strategies that will reduce future earnings if necessary.

Carney (2002) reviewed the diverse use and users of the sustainable livelihood approach. She found that the approach has been successfully used, often with pertinent adoptions at international, national, regional and local levels; for research, planning, monitoring and evaluation, and policy development; and to move beyond sectoral concerns to address livelihood issues which cross-sectoral institutional boundaries. She also found that attention should centre on:

- Addressing the implications of the approach for institutional and organisational change.
- Developing the approach to fill some gaps, particularly regarding rights and power issues including gender; and deepening the analysis of market issues.
- Increasing the effectiveness of sustainable livelihood approaches as a means to poverty reduction involves continuing flexibility and innovation, and in particular: maintaining a high level of critical thinking in analysis; avoiding using the approach as a blueprint; and prioritizing the sharing of ideas.
- Actively maintaining a clear poverty reduction focus and a strong emphasis on people-centred development, and always thinking through to actual livelihood impacts on poor people.

Clark and Carney (2008) found that sustainable livelihood approaches can be used in the identification of development priorities and new activities. They can also be usefully applied to reviews of current activities that were not designed with sustainable livelihood principles in mind, helping to identify problems such as an undue focus on physical outputs of sectoral objectives, at the expense of a broader focus on livelihood improvement and poverty reduction. Within projects/programmes, they can be used to sharpen the focus of monitoring and evaluation systems and in the development of log frames.

Siva Prasad and Eswarappa (2007) note that during the last 50 years, the planning process in India has failed to reduce the disparity between the tribal and non-tribal populations. Today, the first and foremost problem before tribal communities in India is how to earn and sustain livelihoods. There are varieties of livelihood practices by the tribal communities in different parts of India and elsewhere, such as by the hunter-gatherers, pastoralist, shifting cultivators who live in different environments. Several changes have been taking place with regard to the Land-use, access, control and utilisation of their resource and these changes, in turn, have largely affected the sustainable livelihoods of the people without any sustainable replacement.

Sarah and Mehrul (2004), from a household livelihood perspective, observe that food security is a function of whether food is available on-farm or in the market, whether households have access to the food, and whether patterns of food utilisation, including intra-household distribution, are such that the nutritional needs of all household members are met. In essence, a livelihood analysis of food security at the impact level assesses the quantity and quality of food available to households throughout the year and the distribution of food among all household members. Often, food security is effectively measured by a household's capacity to cope with stress periods, either seasonal or inter-annual.

1.4.1 Agriculture and livelihoods

Maithreyi Krishna Raj (2006) studied the livelihood of more than half of India's working population involved in agriculture and its allied activities. Despite there being an

increase in the quantity of foodgrains being produced domestically as well as in the imports of foodgrains, India has been unable to achieve food security. The group most adversely affected by this is women in agriculture: their contribution to farm labour is hardly recognised, they are remunerated poorly and they suffer from chronic energy deficiency.

Jonathan Rigg (2007) reviewed the changes of rural life and livelihood, and discussed their impacts on agriculture and reflects on their implications for rural development. Agriculture is being compressed by non-agricultural pursuits, aspirations are increasingly informed by a wish to avoid farming and the 'household' is being restructured as the genders and generations contest and their respective roles.

Dahlberg (1994) stated that stagnation in agriculture due to human-induced land degradation has been the subject of debate for several decades, especially concerning semi-arid parts of sub-Saharan Africa. Earlier, research efforts were devoted to the definition of processes of degradation and desertification, and explanations were found mainly in poor management regimes leading to overgrazing, over-cultivation and deforestation. Research in the last two decades, however, has demonstrated that techniques and management-oriented explanations are inadequate, not least in explaining the diversity of change and in attributing sufficient importance to social and political factors, both at the micro and the macro levels.

Onduru et al. (2008) studied the access to the sustainability of dryland farming systems of Eastern Kenya based on farmers' perceptions of their farming environment and the implications for rural livelihoods. The study showed that soil fertility and yield of staple food crops (maize) have declined in the past decade and that current farming systems are not able to produce adequate food and income to the dependent households. Thus, the farming system is showing symptoms of unsustainability. Improving farming system sustainability in this dryland area will ultimately require integration of technical and policy options that take cognizance of farmers' abilities, opportunities and socio-economic circumstances.

Vepa (2005) studied the agricultural pattern and animal husbandry of the rural

livelihoods security system. However, the contribution of agriculture to the Gross Domestic Product (GDP) has been stealing declining over the year. But the share of agriculture in providing employment has been static. Thus, the responsibility of providing employment and livelihood to a majority of the population continues with agriculture, in the diversification of economic activity. Agriculture progress is the best safety net against hunger and poverty, as it offers effective social protection. Indian agriculture is, therefore, not just an instrument for producing food for the urban population, but is the major source of livelihood opportunities in the country. Recently, the mainstreaming of the ecological dimension is the assessment of security acceptance by policymakers. Agriculture only can be sustainable to rural, urban and country. The goal of food security should be pursued and achieved through sustainable use of environmental resources. The natural resource of the country should be sufficient to sustain the livelihood of the local population and satisfy their economic and domestic needs in the future, including that of agriculture crop production of livestock. If natural resources are destroyed, it will not be possible to sustain livelihood for a long time.

Benjamin et al. (2004) explore natural resource management efforts in four communities in Mali's Mopti Region to highlight applied and theoretical concerns related to the impact of decentralisation on livelihood security and biodiversity conservation. This work focusing on relations between communities and the different organisations involved in decentralised natural resource management (NRM), including local government; and community experience in reconciling inconsistencies between local practices and natural resource policy under decentralisation. The key argument is that institutional analysis of decentralised natural resource management must look at the interplay between institutions at different levels – community, local and national. Yet, these policies give local elected officials great discretion in how they engage with communities and customary institutions. The livelihoods that decentralised local governments engage synergistically with communities depend on the political nature of their jurisdictions and the bargaining power of the communities.

Andrew Ainslie (2005) explores the role of cattle ownership in the fragile land and livelihoods, and the cultural politics of households in rural areas of South Africa. It presents the social, economic and cultural changes that affect relations both within

households and concludes with some thoughts on the role of cattle-linked livelihoods in affording people a measure of economic and social autonomy at the household level.

1.4.2 Socio-economic status and livelihoods

Watts (1983) suggests that households do not respond arbitrarily to a food crisis for which they are in some sense conceptually prepared; rather they do so serially, with respect to the intensity of what one might call famine signals. His survey led him to group the 10 most commonly observed responses into the following sequence: 1. Collect famine foods, 2. Borrow grain from kin, 3. Sale of labour power, (migration) 4. Engage in dry season farming (migration), 5. Sale of small livestock, 6. Borrow grain or money from merchants/ moneylenders, 7. Sale of domestic assets, 8.Undertaking farmland, 9.Sale of farmland, and 10. Migrate permanently.

L.K.Arun et al. (2001) have investigated the occupational bases of livelihoods of two tribal groups - Western Ghats Mannas and Paliyans in the Periyar Tiger reserve by analysing tribes the livelihood activities and status. The study also identified that there is an increasing demand for fishing locality and family income from agriculture in both tribes is low. Their educational status is also very low, even though their income level is relatively high.

Campbell (2003) found that most households in Southern Zimbabwe relied on the cash and subsistence income from a number of sources such as dry and crop production, gardening, livestock production, woodland activities, wage or home industries and remittances/gifts. The author suggested three key drivers of change in rural livelihood; (a) rainfall, (b) macro-economic changes and (c) changing institutional arrangements and social processes.

Joffe (2007) studied the health status, education status and livelihoods in low-income rural systems. He highlights that the world population was living with hunger and food insecurity, and undernutrition has decreased, but the absolute number remains stubbornly large. An even larger number of people have enough to eat but suffer from severe micronutrient deficiencies. The predicament of poor households can be represented in terms of a self-reinforcing cycle involving nutrition, health, and productivity. The degree of poverty limits the quantity and quality of food intake. Macro and micronutrient

deficiencies interfere with child growth and development and impair immune function, resulting in a predisposition to infectious diseases. Health status strongly influences the quantity and quality of labour and achieved educational status. The high risk of child mortality prevents households from going through the demographic transition to smaller families and better-educated children.

Chianu et al. (2008) studied the livelihoods and wealth distribution among farm households in western Kenya. Agriculture is the main source of livelihoods. Labour is mainly allocated to crop enterprises. Poultry, followed by cattle rearing dominated livestock enterprises. Few households diversified into small businesses, employment and artisan to enhance livelihoods. Lack of cash and limited land access are the most important factors constraining agricultural development. Although most households prefer selling the produce in markets where prices were better, many not only sold 40 produce but also purchased inputs from nearest towns due to high costs of accessing better price markets.

David (1999) studied household livelihood security in the urban settlement. He revealed that livelihood strategies could be complicated and confusing in urban settlements. Contexts were changing and uncertain with accelerating urban growth, increasing crime, an ill-equipped public sector and intense competition for limited resources. Household members employed complex, varied strategies, often living on credit, surviving and competing in markets, undertaking seasonal work and earning incomes in the informal economy within the city. Women were more severely affected than men by poor and overcrowded housing. Women usually look after the children, stay at home during the day, care for sick family members and manage the household. Therefore, it badly affected the livelihood security of women.

Sathyapalan Jyothis and Johnson Derek (2008) explore the livelihood insecurity among the fishing communities of Gujarat, a State in India. Technological externalities and market imperfections have reinforced insecure livelihood options for vulnerable sectors within the fishery. The study reveals that the greatest impact has been felt by poorly capitalised trawler boats. Fishing communities are poorly endowed with fishing assets, household amenities and education. Seasonality, lack of adequate

education, low literacy and inadequate health provision hamper their ability to diversify livelihoods. The fishers were exposed to risks like accidents and hardships due to working conditions and long days away from the shore. To provide livelihood security, the study calls for organised and controlled products and labour market, and protection to workers on the beach and in the sea.

Frank et al. (2002) conducted a study on livelihood and rural poverty reduction in Malawi. They revealed useful insights about the individual's attempt to construct viable livelihood strategies. One of the key points that emerged was landlessness. Therefore, several emerging trends were apparent and one of the important trends was for matrilineal traditions of land inheritance to be replaced by matrilineal forms, with implications for the future livelihood security of women.

The study conducted by **Mahesh (2010)** attempted to examine the natural resource depletion on the livelihood of the poor in the small scale fishing community in the coastal fishery sector of Kerala. He examined the economic condition of fisherfolk in the small scale sector in Pullivilla, a typical coastal village in Neyyattinkara taluk of Thiruvananthapuram district in the context of change in access to and depletion of marine resources. There were significant differences in fishing income among the small-scale fishers in the village due to the differences in technology. By fitting a production function for the two types of operations motorised plywood and non-motorised Kattamaram, the study suggested that more trips have to be carried out to increase the output. For Kattamaram operations, contribution of labour is the main and only output for increasing catch. For motorised operations, increase in the labour employed, fuel used and engine power are the major influencing inputs. Using the modern sophisticated engines, the operators can go deeper and also reach the fishing ground and return to the landing place quickly. In this study, fishers are not willing to increase the number of trips because the decision to undertake a particular fishing activity is taken by the team based on the simultaneous integration of the past experience and the immediate observation aided by human sense.

David (1995) found that the nature and level of remittances vary widely depending on the accessibility of the home village, employment opportunities, the cost of living, the

ease of remitting, and the orientation of the migrant. The average remittances were very low but were nevertheless vital to food security as a way to diversify risks and ensure support in times of harvest. In three of her case study areas, very little remitted money was spent on agricultural investment. The money was neither used to hire labour agricultural materials nor invest in livestock.

Mukherjee et al. (2012) stated that the natural environment surrounding the people provides several goods, services and amenities to them, but using the environmental resources for one purpose always reduces its ability to supply them with other services. This limited natural resource base surroundings, the tribal societies being scarce and many conflicting demands placed on it from other sectors and other areas of society reduce their availability to the tribal communities and affect their livelihood. Sometimes, the outsiders use the tribals of the locality to destroy the resources, especially forest resources, by encouraging overexploitation of timber, grazing lands and croplands. Sometimes, the people in the communities are aware of the dangers of this sort of habitat destructions but they badly can influence and arrest the exploitations. They have little knowledge and little power to influence the direction of change taking place due to broader changes in society. Though their livelihoods were mostly depending on forest resources, the resource was not sufficient to meet the demands of the growing population. Traditionally, the options for livelihood were not much diversified. The tribal communities had no much opportunity to go out.

Siribut (2007) carried out a study to determine the socioeconomic contributions of agro-biodiversity to the livelihoods of smallholder farmers in three sites with different land-use systems in Chiang Mai province, northern Thailand. The highest was observed in the agroforestry-based system, which also showed the highest achievement in social relations where collective action was embedded. The biodiversity vegetable-based system produced stable and high farm income, but achievement was more individualistic. The irrigated rice-based system, with its limited crop choices, was vulnerable to price changes. It was generally observed that agro-biodiversity enhancing land-use practices can increase food production and ecosystem services, and improve socio-cultural values, but the extent of these contributions has yet to be quantified.

Sunethra Thennakoon (2001) studied the regional imbalances in socio-economic development and its impact on the imbalances are caused by the availability of livelihood assets, level of government development intervention and the variation in the physical environment. The study is based on primary data collected from four villages in Sri Lanka with special emphasis on capital assets and strategies. The livelihood status of villages is summarised in terms of a pentagon depicting the five assets and marked differences were observed within and between villages. The study also highlights the implications for policy for sustainable livelihoods.

Jager (2007) studied the participatory innovation in soil fertility management to improve the rural livelihoods in East Africa. He showed that once smallholders are equipped with the knowledge and capacity to learn, they are empowered in organisations and connected to markets and the private sector, they can substantially improve their rural livelihoods. Therefore, a focus on experiences shows that the sustainability of group learning processes increases considerably when the groups engage successfully in commercial activities at the same time. Innovations in soil fertility management were most successful and had the greatest impact on livelihoods in areas with both high agricultural potential and access to large urban markets. Investments in soil management or other technologies can be realised more easily by smallholders when they have opportunities to generate cash through commercial sales and value-addition, or when they have access to non-farm income. In more marginal areas, most investments in inputs and technologies were financially unattractive or risky. In these areas, priority needs to be given to creating a more conducive environment for smallholders to do business and explore alternatives to food crop production.

Roe (1998) stated that livelihood connotes the activities, entitlements and assets by which people make a living. Assets in this particular context are defined as not only natural/biological but also social, economic, political, human and physical. The access to use of and interaction among these assets serve as the foundation of a livelihood system. Gendered contributions to overall household well-being as well as distinct and heterogeneous adaptive and coping strategies that are pursued at an intra-household level also form a livelihood system. A last component of the livelihood equation is a sustainability issue. A livelihood is sustainable if it can cope with, recover from and adapt

to stresses and shocks, maintain and enhance its capabilities and assets, and enhance opportunities for the next generation.

According to **Wolfe and Tucker (1999)**, economic security is the availability of a steady and reliable source of income to sustain a daily living for oneself and one's family and to allow planning. To increase economic security for victims of sexual assault, dating, and domestic violence and stalking, a coordinated, interdisciplinary and multilevel response is required. For more women to be free from the constraints of violence, access to real economic options must be available. Such options include affordable and safe housing and childcare, adequate employment opportunities, financial assistance when necessary, and comprehensive, affordable health services including mental health services.

Davies and Hossain (1997) notes that labour markets also offer non-farm opportunities for income generation differentiated by other considerations, such as education, skills, location, and gender. The economic motivation for diversification in relation to seasonality applies more generally. When the marginal return to labour time in farming for any individual falls below the wage rate or the return to self-employment attainable for that person off the farm, then ignoring intra-household distributional issues, the household as a unit is better off switching that individual into off-farm or non-farm activities. Work opportunities vary according to skills, education and gender. Economic considerations of labour allocation may be overlaid and modified by social rules of access both within the family and in the community. These rules may result in the social exclusion of individuals and households from particular income streams.

Sphere (2004) stated that the objectives of livelihoods programming in emergencies can range from assisting in meeting basic needs to livelihood protection and livelihood recovery. Although relatively rare, there is an increase in the number of examples of livelihoods interventions during the ongoing conflict, most of which focus on improving food security. These interventions can be categorised as production, income and market support.

1.4.3. Migration and Sustainable Livelihoods

In the literature, as this review shows, there has been a disagreement about the relationship between poverty and migrations, which leads us to assume that the correlation is likely to be context-dependent. In the first place, for the understanding of the link between migration and sustainable livelihoods, it is important that it is not only poverty that causes migration, but also inequality. The Indian Village Studies project (Connel et al., 1977 & Lipton, 1980) in the 1970s found that unequal, and not the poorest, villages had the highest rates of out-migration. It is likely that not only 'objective' inequality, but also people's perceptions are a determinant factor.

Migrants come from a variety of backgrounds, and different groups concentrate on specific occupations; migration streams are strongly segmented (e.g. de Haan & Rogaly, 1996). They belong to various ethnic groups, castes, and are both landless and landowners. Although there is some evidence that the landless migrate less - because they cannot afford the necessary investment - this seems to be context-specific: in some areas, they migrate less, but this is not necessarily the case in other areas or other periods. Relatively, migrants come from a variety of districts, not necessarily the poorest. Some areas have developed a tradition of migration, and once certain patterns of migration exist, they do not change easily.

Data on expenditure and income of migrants as compared to non-migrants confirm the diversity of migration experiences. Although the poorest in rural areas may find it difficult to migrate, data shows that in some areas, the poorest do migrate. Comparison with the non-migration population in urban areas shows that migrants are usually slightly better off (especially when controlled for human capital factors). Finally, the scarce data about how migrants fare over time does indicate that they often are able to improve their position. If initially they are slightly worse-off, they make up for the differences rather quickly.

The evidence of the effect of migration and remittances and livelihoods also points at a complex relationship. Research by Stark (1991) in Mexico, and recently Adams (1996) in Pakistan has shown that international migration increases inequality, whereas national

migration decreases it. However, Gustafsson and Makonnen (1994) show that remittances from mining activities decrease inequality in Lesotho. The conclusion we draw is that, obviously, livelihoods and poverty clearly affect, and are affected, by migration, but that there are no easy generalisations. It is essential; therefore, the research on sustainable livelihoods focuses on the complexity of migration processes and is dependent on local contexts.

Cutler (1986) describes a model of pre-famine behaviour as applied to Beja famine migrants in Sudan. There emerges a clear sequence of coping strategies which fall into three distinct stages: a) Adaptive strategies: sale of livestock, labour migration, use of credit, and self-employment. b) Sale of key productive assets: sale of tools, sale of animals, sale of land. c) Mass migration.

Rahmato (1987) suggests that the elements of famine survival may be grouped into four sequential series of activities. In the first stage of this sequence, households would cope with a risk to their livelihood by severity and reduced food consumption. At the same time, there would be increased dependence on loans and transfers of food and assets within and between families. Temporary migration in search of wage employment formed the second stage. Once these options had been exhausted, farmers would rely on divestment. But this is selective and gradual and the exact sequence in which assets were sold or mortgaged depended very much on the current market conditions. Detailed case studies of the transactions that households undertook and why are reported. The fourth and terminal stage of these strategies was crisis migration and the decision to resort to this was often taken at a community as well as a household.

Deshingkar and Start (2003) brief how India has succeeded in entering accumulative migration pathways while others have been excluded. The author adopts a social exclusion and livelihoods approach in analysing the livelihood implications of seasonal migration. It finds that migration patterns are determined by people's access to resources, the environment, intra-household relations, wider social relations, and not just the productivity and demand for labour in an area. The paper concentrates on migration in the States of Andhra Pradesh and Madhya Pradesh. The important migration factors in AP and MP include the historical development of different regions. The author also highlights

the importance of livelihood options that are complementary to migration, the availability of surplus labour within the household as well as decisions related to children's education. A strong correlation is found between scheduled castes and being poor, illiterate and asset -less, as well as being discriminated against by employers and contractors. The paper also finds that migrant sugarcane cutters, earth workers and agricultural labourers from remote and poor villages of AP and MP have improved their standard of living significantly through migration, and are investing their savings in agriculture and education.

Mankonnen (1994) attempts to examine that migrants come from a variety of backgrounds and different groups concentrate on different occupations; migration streams are strongly segmented. They belong to various ethnic groups, castes, and are both landless and landowners. International migration increases inequality, whereas national migration decreases it. However, remittances from mining activities decrease inequality in Lesotho. The conclusion we draw is that, obviously, livelihoods and poverty clearly affect, and are affected by migration, but they are no easy generalisations. It is essential; therefore, the research on sustainable livelihood focuses on the complexity of migration processes and is dependent on the local context.

Patosaari (2007) stated that forests are an important component of adaption and migration strategies needed to address the direct and indirect effects of climate change on people and livelihoods. Forest base adaption and mitigation actions are effective for rehabilitation of degraded land, maintenance of soil water quality, reducing deforestation, and reversing the loss of forest cover. Forest base adaption and mitigation strategies not only have the potential for protecting household's and livelihoods' from some of the harmful effects of climate change but also provide opportunities for sustainable rural development and poverty alleviation through income generation and employment opportunities. Sustainable forest management is thus a critical component of any policy and action programme aimed at addressing the emerging impact of climate change on rural household and livelihood.

1.5 Conceptual Framework of the Study

To provide the conceptual and theoretical foundations of this study, we present a conceptual framework (Figure 1) for household livelihood sustainability analysis based on

the sustainable rural livelihood framework. Natural and socioeconomic (e.g., market fluctuations, education level, policy background, etc.) contexts influence household decisions to engage in various livelihood strategies (e.g., farming, local off-farm or labour-migrant). Subsequently, different strategies can result in different livelihood outcomes (including security, basic material for a good life, health, and environmental quality) through changes in livelihood assets, income, energy utilisation, Land-use, outmigration, etc. These outcomes impact the overall sustainability of a livelihood portfolio. In light of these different livelihood consequences and contexts, policymakers try to improve the sustainability of household livelihood outcomes through policy innovation. Here, we first classify household livelihood strategy choices and then examine the factors that impact different types of livelihood strategies and their possible livelihood consequences based on our data.

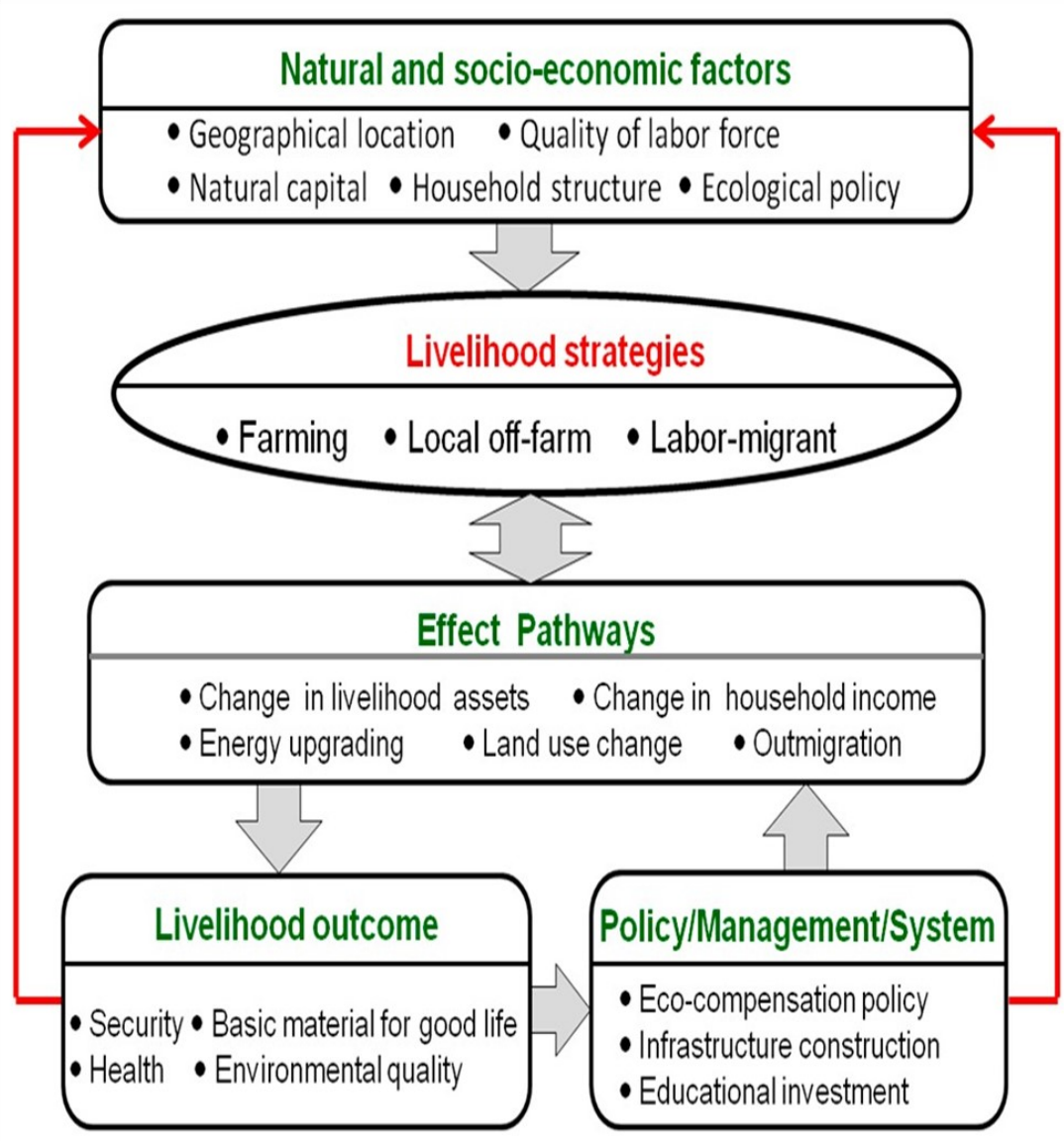


Figure 1.5.1: Livelihood Strategies

Source: DFID; London,2000.

CHAPTER-2
METHODOLOGY

The present study is an inductive research study and designed to generate new information on sustainable farm-based livelihood strategies followed by farmers and agricultural labourers in Jharkhand and Karnataka States of India. In order to capture the essence of strategies, we followed both exploratory and descriptive research strategies to have flexibility in documenting various dimensions of the livelihood strategies.

2.1 Objectives of the Study

The present study is executed with the following objectives:

1. To study the sustainability of farming practices
2. To assess the overall impact on sustainable livelihoods practices

2.2 Hypotheses of the Study

Based on the conceptual framework of the study, we hypothesise the following relationships:

1. There is a positive correlation between sustainable income generation from farm-based livelihood strategies of various people and their access to capital asset/s, enhanced skills and appropriate institution.
2. Farm-based sustainable livelihood practices also have a positive correlation between people's identity (how see themselves), perception (how others perceive them), livelihood choices outcomes and impact.

2.3 Sampling Framework of the Study

The following framework was developed to determine and select the required number of sample respondent, i.e. farmers and agricultural labourers, for the collection of primary data on various aspects of the research interest.

2.3.1 Sampling Method

In this study, a multi-stage sampling method is used to select the sampling units of the study.

First stage: For the purpose of the study, all the States in the country are grouped into two categories, viz. the Southern States and Northern States.

Second Stage: Based on the diversity in agricultural practices and environmental conditions in the States, Karnataka among the southern States and Jharkhand among the Northern States are purposively selected for the study.

Third Stage: Ramgarh and East Singhumburi districts from Jharkhand State and Tumkur, Gulbarga and Belgaum districts from Karnataka State were purposively selected for the study.

Fourth Stage: The agriculture, institutional arrangement and climatological profile of all the blocks in each district were studied. It was decided to consider Gubbi block in Tumkur district, Sedam in Gulbarga district and Raibagh in Belgaum district as sample blocks in Karnataka State. Similarly, Gharsila and Patamda blocks in East Singhumburi district and Mandu block in Ramgarh district were considered for the study in Jharkhand State.

Fifth Stage: After assessing the proportion of the farming population and the socio-economic and agricultural profile of the villages in the selected block, a total of eight villages were purposively selected for the study. The distribution of the villages is represented in the following table. According to the data required for the study, we decided to include farming household as the sampling units for the collection of the primary data required for the study.

Table 2.3.1: Sample Villages

State	District	Block	Name of the Gram Panchayat and village	Sample size
Karnataka	Tumkur	Gubbi	Muginahunase	50
			Horakere	50
	Gulbarga	Sedam	Kontanpalli	50
	Belgaum	Raibagh	Savasuddi	50
Jharkhand	Ramgarh	Mandu	Bongabar	50
			Gargali (Mandu Chatti)	50
	East Singhbum	Ghatsila	Dainmari(Kalchiti)	50
		Patamda	Geruara (Ouriya)	50

2.3.2 Sampling Frame for the Study

In this study, we have used the households' list provided by the village officer as the sampling frame for the selection of the sampling units.

2.3.3 Sample Size

In this study, we have used the following Cochran's formula for determining the study sample size. Accordingly, we decided to include at least 400 sample respondents for this study.

$$n_o = z^2pq/e^2$$

Where n_o= Sample Size; Z = Z table value for confidence level (1.96 for 95% confidence level); P = Population Proportion (0.5 as optimal value);
q = constant (1-P) and e = Marginal Error (+/- 0.5% = 0.05)

$$n_o = 1.96^2 \; X \; 0.5 \; X \; 0.5 \; / \; 0.05^2$$

n_o = 384.16 (which is rounded as 400)

It is decided to select 50 persons from each village as the sample respondents of the study. Among the selected persons 10-15 members from each village were purposively selected for the focus group discussion.

2.3.4 Sampling Technique

In this study, we have used random sampling technique to select sample

respondents for the study. The respondents from each population were selected through the lottery technique.

2.4 Data Collection

This study required both primary and secondary data to meet the research objectives. The various methods/techniques that were implemented to collect data from primary or secondary sources are discussed below.

2.4.1 Secondary Data Collection

In this study, secondary data is required for various aspects of the research like climate and agriculture profile of the selected villages, demographic details of the respondents, agriculture production details of the selected villages, district, mandal and village profile data. The required data is collected from sources like village office, mandal office, and district statistical officer and census reports.

2.4.2 Primary Data Collection

The primary data required for the study on various aspects of the research interest is collected through survey and group discussion using questionnaire and schedules, respectively, from sample respondents. A structured questionnaire is developed with specific constructs for each variable of interest to elicit responses from the sample population. Questionnaire and schedule are finalised after making the necessary changes that were highlighted during the pilot study.

The study's questionnaire consisted of questions on various sections like socio-economic and demographic status of the respondents, livelihood vulnerability context, coping mechanisms to vulnerable conditions, strengthening of livelihoods during vulnerable conditions, sustainable livelihood practices in agriculture and allied sectors, agricultural performance of individual farmers and impact of improved practices on livelihood.

During the primary data collection, all the questions in the questionnaire were explained to the respondents and their respective responses were carefully marked on

given space in the questionnaire. All the consensus and views given by the members of the focus group discussion were noted down by the researcher. All of such data was further transformed into Excel datasheets for editing. During the editing process, all the outlier and ambiguous observations were removed and the data was fine-tuned for analysis.

2.5 Analytical Framework of the Study

The primary and secondary data collected during the study period were analysed by following the analytical framework of the study.

2.5.1 Variables of the Study

The present study includes following variables for assessing vulnerability and sustainability context of the agricultural practices. All the variables of the study were grouped under two categories such as general and context variables. General variables include household demographic variables, household personal variables and household economic variables. Context variables include household livelihood competency, vulnerability status of household livelihood, capitalising capacity-building efforts, adoption of improved practices in livelihood and sustainable index of improved livelihood. A detailed description of the context variables is given below.

Table 2.5.1: Analytical Framework

'Household Livelihood Competency'	'Vulnerability status of household livelihood'	'Capitalising Capacity building efforts'	'Adoption of improved practices in livelihood'	'Sustainable Index of Improved Livelihood'
The natural status and relative competency level of household's livelihood in enabling them to cope with the vulnerable conditions.	Variable described as the level of vulnerability of livelihood towards social, economic and climatic conditions.	The individual ability in leveraging his/her capacities that were enhanced either through self-efforts or through external assistances while making necessary changes in their livelihood to sustain distress situations.	The adoption of new methods or modification of existing production of methods in agriculture and associated livelihood activities	The observable changes that occurred in respondents' livelihood as a result of the creation of assets

In this study, the ***'Household Livelihood Competency'*** variable is described as the natural status and relative competency level of household's livelihood in enabling them to cope with vulnerable conditions. The variable ***'vulnerability status of household livelihood'*** is described as the level of vulnerability of livelihood towards social, economic and climatic conditions. The ***'Capitalising Capacity building efforts'*** variable is described as the individual ability in leveraging his/her capacities that were enhanced either through self-efforts or through external assistances while making necessary changes in their livelihood to sustain distress situations. The variable ***'adoption of improved practices in livelihood'*** is described as the adoption of new methods or modification of existing production of methods in agriculture and associated livelihood activities. The ***'Sustainable Index of Improved Livelihood'*** variable is described as the observable changes that occurred in respondents' livelihood as a result of the implementation of the new or modified practices. (If the regression model is to be used, there is a need to define the independent variables and the dependent variable)

2.5.2 Analytical Models of the Study

In this study, we are using both descriptive and inferential analytical techniques to analyse the data collected in the study. The descriptive techniques include percentages tabulation and graphs. The inferential techniques include correlation and regression. The hypotheses of the study are tested through the coefficient values of correlation and regression.

2.5.3 Measurement of Variables

While collecting the data on the above variables, various direct and indirect measures are used in this study. The demographic, social and economic variables pertaining to the household general details are measured with direct measures, whereas the context variables are measured through constructs. A construct with seven questions is used to measure 'Household Livelihood Competency.' The variable 'vulnerability status of household livelihood' is measured through a five-question construct. Another variable 'capitalising capacity building efforts' is measured through a construct containing 10 questions. A construct with 12 questions is used to measure the variable 'adoption of

improved practices in livelihood.' The variable 'sustainable index of improved livelihood' is measured through a construct that contains 15 compound questions on the impact of improved practices on various farming and associated livelihoods.

'Household Livelihood Competency' variable described as the natural status and relative competency level of household's livelihood in enabling them to cope with vulnerable conditions.

How one can assess the vulnerability status of the livelihood?

While measuring the vulnerability status of the livelihood, one can understand the various dimensions of the vulnerability on livelihood. In all, the following dimension of livelihood vulnerability could be explored in household context:

1. **Economic vulnerability of the livelihood-** it can be perceived as the remunerative of the livelihood during the past period
2. **Social vulnerability of the livelihood-** it can be perceived as the relative social value of the particular livelihood in society, social value of livelihood in the past
3. **Climatic vulnerability of the livelihood-** it can be perceived as the status of the livelihood towards various climatic extremes like droughts, floods, heat waves, etc., in the past
4. **Obsolescent vulnerability of the livelihood**- it can be perceived as the gradual obsolescence of certain livelihoods due to the changes that occurred in component technologies, emergence of alternative livelihood, systemic changes in the social structure, etc., in the past
5. **Policy Exclusionary vulnerability of the livelihood**- it can be perceived as the exclusion of the livelihood from economic stream light by policymakers either due to insignificant economic role or development rationalisation in the past

Operationalisation of the ***'Household Livelihood Competency'*** variable in the present study exhibits that the higher the status of one's livelihood, across the above vulnerable dimensions, the lower the competency of the livelihood in terms of sustaining the vulnerabilities. Hence, it is proposed to assess the livelihood of household across the

above dimensions. Accordingly, we could frame construct with the following items.

What was/is the livelihood of the household during the prior and post time period to reference year?

During prior period to the reference year: _____

During Post period to the reference year: _____

A. Economic Vulnerability:

1. What was the average gross revenue received from your livelihood during the triennium prior to the reference period? (need to have a particular year where the network agencies have begun to empower the households as reference year)
2. Was that reported average gross revenue lower than or equal to the gross annual revenues of preceding years? (rationale for this question is that if the revenues of lower, one could interpret the declining trend in the economic returns of livelihood; if the revenue are equal to previous years, one could interpret stagnation of economic output in livelihood)
3. What was the average net income that was earned during the last triennium prior to the reference period?
4. Was that reported average net income lower than or equal to the net income of preceding years?
5. What was the trend of the flow of net income from your livelihood over the past five years from the reference year?
6. If there was a decreasing trend, what would you think of probable reasons for that trend? If there was an increasing trend, what could be the reasons?

B. Social Vulnerability of the Livelihood

1. How long have you been pursuing this livelihood?
2. Prior to the reference year, while pursuing your livelihood, were you given appropriate recognition by the fellow members of the society? Yes/No
3. How do you rate the value of your livelihood social value in terms of recognition by fellow members of the society? (rate in 1-5 scale)
4. Over the period prior to the reference year, what was the trend of the social value of

the livelihood? Increasing/Decreasing

5. How do you rate such change, in terms of its intensity on a scale of 1-5?
6. If there was a decreasing trend, what would you think of probable reasons for that trend? If there was an increasing trend, what could be the reasons?

C. Climatic Vulnerability of the Livelihood

1. What type of climatic challenges have you been facing in your livelihood prior to the reference year?
2. How often your livelihood was severely affected due to such climatic extremes?
3. (Provide appropriate options)
4. Over the period prior to the reference year, what was the trend of the occurrence of events where you have lost your subsistence due to the effect of climatic extremes on your livelihood? Increasing/decreasing
5. How do you rate your livelihood prior to the reference year in terms of its vulnerable condition to the climatic extremes on a scale of 1-5?
6. If there was a decreasing trend, what would you think of probable reasons for that trend? If there was an increasing trend, what could be the reasons?

D. Obsolescent Vulnerability of the Livelihood

1. Over the period prior to the reference year, what were the major operations that acted as a means to discharge the purpose of your livelihood? (it is assumed that each livelihood involves various technologies or processes that act as means to realising the purpose or end result of the livelihood) (E.g. Tilling with bullock-driven plough, weeding with sickle, digging with hoes, scrapping with spade, etc.)
2. During that period, were these means gradually replaced by new means? Yes/No
3. If yes, what kind of means were replaced by what type of new means?
4. What was the nature of transformation that was observed in means replacement? Traditionalisation/modernisation
5. Whether such transformation or substitution of means in either manner obsolete household livelihood completely or partially? Yes/No
6. How do you rate your livelihood prior to the reference year in terms of its vulnerability to become obsolete on a scale of 1-5?
7. What was the trend of the livelihood obsolescence in the period prior to the

reference year? Decreasing/Increasing

8. If there was a decreasing trend, what would you think of probable reasons for that trend? If there was an increasing trend, what could be the reasons?

E. Policy Exclusionary Vulnerability of the Livelihood

1. Prior to the reference year, was your livelihood duly considered as significant economic activity by policymakers? Yes/No (another way of exploring this dimension in a general manner is as follows)
2. Prior to the reference year, were there any schemes and policies that specifically implemented for the strengthening of your livelihood? Yes/No
3. If yes, what were those schemes and your access to the benefits of such schemes or policies on a scale of 5-1?
4. What was the trend of the number of policies deployed for the strengthening of livelihood to uplift the household vulnerability conditions prior to the reference year? Increasing or decreasing
5. If there was a decreasing trend, what would you think of probable reasons for that trend? If there was an increasing trend, what could be the reasons?
6. How do your rate your livelihood prior to the reference year on a scale of 1-5, in terms of its relative importance given by policymakers while making national developmental policy?

' *Capitalising Capacity building efforts'* variable is described as the individual ability in leveraging his/her capacities that were enhancing either through self-efforts or through external assistances while making necessary changes in their livelihood to sustain distress situations. This variable could be measured with the help of two-dimensional construct. The first dimension of the construct explores the capacity building efforts that were implemented to improve household livelihood, and the second dimension of the construct explores the household perception over such capacity building efforts in terms of the usefulness of such efforts in improving livelihood.

a. Exposure Visits

1.Any time after reference year, have you ever participate or made exposure visits to

learn new knowledge that could improve your livelihood? Yes/No

2. If yes, when did that visit happen? What were the exposure aspects?

State	Visit Period (M&Y)	Exposure Aspects	Visit Duration

3. Who facilitated your exposure visits? Self/**NGO**s: **Govt**./Others
4. How do you rate such exposure aspects in terms of their usefulness in improving your livelihood, on a scale of 1-5?

b. Improvement in Social Capital

1. Any time after reference year, was your **awareness of various institutions** relating to your livelihood increased? Yes/No
2. If yes, how did that happen? Self-efforts/External Assistance
3. If it was External Assistance, who offered that assistance? NGOs:_____/ Govt./ Others
4. What was the process followed to improve your knowledge of livelihood supporting institutions? (we may see the bank linkage on such networking efforts)
5. Name the institutes you have made network with? Explain the nature of the network?
6. How do you rate such institutional awareness-building efforts in terms of their usefulness in improving your livelihood, on a scale of 1-5?
7. Any time after reference year, were your **skills in executing your livelihood activities enhanced**? Yes/No
8. If yes, how did that skill enhancement happen? Self-efforts/External Assistance
9. If it was External Assistance, who offered that assistance? NGOs:_____/ Govt./ Others

c. Training / ICT

10. What was the process followed to improve your skills for the betterment of your performance while discharging your livelihood activities? Training/ICT Methods
11. If it was training, when did that training happen? What were the training aspects?

Training Period (M&Y)	Training Aspects	Training Duration

(We may include Alternative Livelihoods Such as Livestock, Small Ruminants rearing, kitchen Garden, Backyard Poultry, Vegetable Cultivation as the training aspects)

12. How do you rate such training aspects in terms of their usefulness in improving your livelihood, on a scale of 1-5?
13. If it was ICT Methods, what ICT method was demonstrated on what aspects?

Demonstration Period (M&Y)	ICT Method	Aspects of livelihood interest

14. How do you rate such skill enhancement efforts through ICT demonstration in terms of their usefulness in improving your livelihood, on a scale of 1-5?
15. Kiosk Services

1. How do you rate such skill enhancement efforts through ICT demonstration in terms of their usefulness in improving your livelihood, on a scale of 1-5?
2. Kiosk Services
3. Were there any of such schemes like 'Kiosk Services' present before the reference period? Yes/No
4. If yes, what are such schemes?
5. What kind of services you have been offered under this 'Kiosk Services'?
6. Whether such services helped you to strengthen your livelihood? Yes/No
7. If yes, rate your opinion of such services in terms of their usefulness for improving your livelihood on a scale of 1-5?

'Adoption of improved practices in livelihood' is described as the adoption of new methods or modification of existing production of methods in agriculture and associated livelihood activities.

1. After reference year, what are the major changes you have made in your livelihood practices, by considering your enhanced capacity?
2. Has this adoption of improved practices helped you in realising advantageous edge in your livelihood? Yes/No
3. If yes, rate your opinion on the adoption of new technology in terms of the utility of the adopted methods in improving household livelihood on a scale of 1-5?

' *Sustainable Index of Improved Livelihood'* variable is described as the observable changes that occurred in respondents' livelihood as a result of the implementation of the new or modified practices.

(Please include all those pre and post evaluation tables of following items in this section)

a. Income increase from Agriculture, Livestock, Small ruminants, Backyard Poultry and Vegetable Cultivation
b. Employment Enhancement
c. Debt Reduction
d. Migration

2.6 Profile of the Sample Villages

a) Horakere:

The total geographical area of Horakere village is 268 hectares. Horakere village, with a population of 700 is Gubbi sub-district's 132nd most populous village, located in Gubbi sub-district of Tumkur district in the state of Karnataka in India. The total geographical area of Horakere village is 3 km^2 and it is the 165th smallest village by area in the sub-district. Population density of the village is 261 persons per km^2. The land-use details of the village are presented below.

Table 2.6.1: Land-use Details of Horakere (in Ha.)

Land-use details of Horakere (in Ha.)	
Number of forest land	0.00
Number of government canals	0.00
Number of private canals	0.00
Well (without electricity)	0.00
Well (with electricity)	3.26
Tube-well (without electricity)	0.00
Tube-well (with electricity)	0.00
Tank	0.00
River	0.00
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	3.26
Unirrigated area	188.87
Culturable waste (including *gauchar* and groves)	0.00

The village is home to 700 people, among them 343 (49%) are male and 357 (51%) are female. Ninety-one per cent of the whole population are from general caste, 9% are from Scheduled castes. Child (aged under 6 years) population of Horakere village is 10%; among them 54% are boys and 46% are girls. There are 181 households in the village and an average of 4 persons live in every family.

Table 2.6.2: Caste-wise Male-Female Population (2011)-Horakere

	Total	General	Scheduled Castes	Scheduled Tribes	Child
Total	700	568	63	0	69
Male	343	276	30	0	37
Female	357	292	33	0	32

As of 2011 census, there are 1041 females per 1000 male in the village. Sex ratio in general caste and scheduled castes is 1035 and 1100, respectively. There are 865 girls under 6 years of age per 1000 boys of the same age in the village. Overall sex ratio in

the village has increased by 88 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has decreased by 230 girls per 1000 boys during the same time. A total of 402 people in the village are literate; among them 229 are male and 173 are female. Literacy rate (children under 6 are excluded) of Horakere is 64%. 75% of male and 53% of the female population is literate. Overall literacy rate in the village has increased by 10%. Male literacy has gone up by 7% and the female literacy rate has gone up by 13%. Horakere has 67% (469) population engaged in either main or marginal works. 70% male and 64% female population are working population. 62% of the total male population are main (full-time) workers and 8% are marginal (part-time) workers. For women 25% of the total female population are main and 39% are marginal workers.

Table 2.6.3: Percentage of Working Population – Horakere

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	67%	43.3%	23.7%	33%
Male	69.7%	61.8%	7.9%	30.3%
Female	64.4%	25.5%	38.9%	35.6%

b) Muginahunase:

The total geographical area of Muginahunase village is 459 hectares. Muginahunase village, with a population of 851, is Gubbi sub-district's 98th most populous village, located in Gubbi sub-district of Tumkur district in the state of Karnataka in India. The total geographical area of Muginahunase village is 5 km^2 and it is the 82nd biggest village by area in the sub-district. The population density of the village is 185 persons per km^2. The land-use details of the village are presented below.

Table 2.6.4: Land-use Details of Muginahunase (in Ha.)

Land-use Details of Muginahunase (in Ha.)	
Number of forest land	0.00
Number of government canals	0.00
Number of private canals	0.00
Well (without electricity)	0.00
Well (with electricity)	0.00
Tube-well (without electricity)	0.00
Tube-well (with electricity)	32.70

Land-use Details of Muginahunase (in Ha.)	
Tank	0.00
River	0.00
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	32.70
Unirrigated area	364.11
Culturable waste (including gauchar and groves)	0.00
Area not available for cultivation	62.19

The village is home to 851 people, among them 408 (48%) are male and 443 (52%) are female. 100% of the whole population are of general caste. Child (aged under 6 years) population of Muginahunase village is 10%, among them 52% are boys and 48% are girls. There are 203 households in the village and an average of 4 persons live in every family.

Table 2.6.5: Caste-wise Male-Female Population (2011) - Muginahunase

	Total	General	Scheduled castes	Scheduled Tribes	Child
Total	851	851	0	0	84
Male	408	408	0	0	44
Female	443	443	0	0	40

As of 2011 census, there are 1086 females per 1000 male in the village. Sex ratio in general caste is 1086. There are 909 girls under 6 years of age per 1000 boys of the same age in the village. Overall sex ratio in the village has increased by 84 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has decreased by 491 girls per 1000 boys during the same time. A total of 559 people in the village are literate; among them 290 are male and 269 are female. Literacy rate (children under 6 are excluded) of Muginahunase is 73%. 80% of male and 67% of the female population is literate here. Overall literacy rate in the village has increased by 5%. Male literacy has gone down by -2% and female literacy rate has gone up by 13%. Muginahunase has

62% (526) population engaged in either main or marginal works. 68% male and 56% female population are working population. 64% of the total male population are main (full-time) workers and 5% are marginal (part-time) workers. For women, 28% of the total female population are main and 28% are marginal workers.

Table 2.6.6: Percentage of Working Population – Muginahunase

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non-Worker** (Among total population)
Total	61.8%	45%	16.8%	38.2%
Male	68.4%	63.7%	4.7%	31.6%
Female	55.8%	27.8%	28%	44.2%

c) Kontanpalli

The total geographical area of Kontanpalli village is 545 hectares. Kontanpalli village, with a population of 1410, is Sedam sub-district's 40th most populous village, located in Sedam sub-district of Gulbarga district in the state Karnataka in India. The total geographical area of Kontanpalli village is 5 km^2 and it is the 50th smallest village by area in the sub-district. Population density of the village is 259 persons per km^2. The land -use details of the village are presented below.

Table 2.6.7: Land-use Details of Kontanpalli (in Ha.)

Land-use Details of Kontanpalli (in Ha.)	
Number of forest land	0.00
Number of government canals	0.00
Number of private canals	0.00
Well (without electricity)	0.00
Well (with electricity)	3.24
Tube-well (without electricity)	1.62
Tube-well (with electricity)	0.00
Tank	0.00
River	0.00
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	4.86

Land-use Details of Kontanpalli (in Ha.)	
Unirrigated area	408.85
Culturable waste (including gauchar and groves)	78.11
Area not available for cultivation	53.18

The village is home to 1410 people; among them; 695 (49%) are male and 715 (51%) are female. 67% of the whole population are from general caste, 32% are from scheduled castes and 0% are scheduled tribes. Child (aged under 6 years) population of Kontanpalli village is 13%; among them; 54% are boys and 46% are girls. There are 285 households in the village and an average of 5 persons live in every family.

Table 2.6.8: Caste-wise Male-Female Population (2011)-Kontanpalli

	Total	General	Scheduled castes	Scheduled tribes	Child
Total	1,410	949	458	3	185
Male	695	459	234	2	100
Female	715	490	224	1	85

As of 2011 census, there are 1029 females per 1000 male in the village. Sex ratio in general caste is 1068, in scheduled castes is 957 and in the scheduled tribe is 500. There are 850 girls under 6 years of age per 1000 boys of the same age in the village. Overall sex ratio in the village has decreased by 43 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has decreased by 112 girls per 1000 boys during the same time. A total of 628 people in the village are literate; among them, 349 are male and 279 are female. Literacy rate (children under 6 are excluded) of Kontanpalli is 51%. 59% of male and 44% of the female population are literate here. The overall literacy rate in the village has increased by 21%. Male literacy has gone up by 22% and the female literacy rate has gone up by 21%. Kontanpalli has 52% (732) population engaged in either main or marginal works. 61% male and 43% female population are working population. 60% of the total male population are main (full-time) workers and 1% is marginal (part-time) workers. For women, 42% of the total female population are main and 1% is marginal workers.

Table 2.6.9: Percentage of the working population – Kontanpalli

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	51.9%	51.1%	0.9%	48.1%
Male	60.7%	60.1%	0.6%	39.3%
Female	43.4%	42.2%	1.1%	56.6%

d) Savasuddi

The total geographical area of Savasuddi village is 2,625 hectares. Savasuddi Village, with a population of 6662 is Raybag sub-district's 18th most populous village, located in Raybag sub-district of Belgaum district in the state of Karnataka in India. The total geographical area of Savasuddi village is 26 km^2 and it is the 10th biggest village by area in the sub-district. The population density of the village is 254 persons per km^2. The land-use details of the village are presented below.

Table 2.6.10: Land-use Details of Savasuddi (in Ha.)

Land-use Details of Savasuddi (in Ha.)	
Number of forest land	0.00
Number of government canal	51.13
Number of private canal	0.00
Well (without electricity)	0.00
Well (with electricity)	632.38
Tube-well (without electricity)	0.00
Tube-well (with electricity)	230.44
Tank	0.00
River	0.00
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	913.95
Unirrigated area	1634.16
Culturable waste (including gauchar and groves)	16.09
Area not available for cultivation	60.80

The village is home to 6662 people; among them, 3393 (51%) are males and 3269 (49%) are females. 89% of the total population are from general caste and 11% are from scheduled castes. None here belongs to scheduled tribes. Child (aged under 6 years) population of Savasuddi village is 16%; among them 52% are boys and 48% are girls. There are 1214 households in the village and an average of 5 persons live in every family.

Table 2.6.11: Caste-wise Male-Female Population (2011)-Savasuddi

	Total	General	Scheduled castes	Scheduled tribes	Child
Total	6,662	5897	756	9	1097
Male	3,393	3017	373	3	566
Female	3,269	2880	383	6	531

As of 2011 census, there are 963 females per 1000 male in the village. Sex ratio in general caste is 955, in scheduled castes is 1027 and in scheduled tribe is 2000. There are 938 girls under 6 years of age per 1000 boys of the same age in the village. Overall sex ratio in the village has increased by 3 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has increased by 86 girls per 1000 boys during the same time. A total of 3140 people in the village are literate; among them, 1814 are male and 1326 are female. Literacy rate (children under 6 are excluded) of Savasuddi is 56%. 64% of male and 48% of the female population are literate here. The overall literacy rate in the village has increased by 9%. Male literacy has gone up by 6% and the female literacy rate has gone up by 12%. Savasuddi has 42% (2809) population engaged in either main or marginal works. 54% male and 30% female population are working population. 52% of the total male population are main (full-time) workers and 2% are marginal (part-time) workers. For women 14% of the total female population are main and 17% are marginal workers.

Table: 2.6.12 Percentage of the Working Population – Savasuddi

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	42.2%	33%	9.1%	57.8%
Male	53.6%	51.6%	2%	46.4%
Female	30.3%	13.7%	16.5%	69.7%

e) Bongabar

The total geographical area of Savasuddi village is 992 hectares. Bongabar Census Town, with a population of 5236, is Mandu sub-district's 3rd least populous census town located in Mandu sub-district of Ramgarh district in the state of Jharkhand in India. The total geographical area of Bongabar census town is 14 km^2 and it is the 2nd biggest census town by area in the sub-district. Population density of the census town is 371 persons per km^2. There is only one ward in this census town, which is Bongabar Ward No. 01 having a population of 5236. The land-use details of the village are presented below.

Table 2.6.13: Land-use Details of Bongabar (in Ha.)

Land-use Details of Bongabar (in Ha.)	
Number of forest land	341.85
Number of government canal	0.00
Number of private canal	0.00
Well (without electricity)	85.12
Well (with electricity)	0.00
Tube-well (without electricity)	0.00
Tube-well (with electricity)	0.00
Tank	
River	
Lake	
Waterfall	
Others	
Total irrigated area	85.12
Unirrigated area	158.23
Culturable waste (including gauchar and groves)	20.52
Area not available for cultivation	385.81

The census town is home to 5236 people; among them; 2688 (51%) are males and 2548 (49%) are females. 69% of the whole population are from general caste, 11% are from scheduled castes and 21% are scheduled tribes. Child (aged under 6 years) population of Bongabar census town is 16%, among them 53% are boys and 47% are girls. There are 1064 households in the census town and an average of 5 persons live in every family.

Table 2.6.14: Caste-wise Male-Female Population (2011)-Bongabar

	Total	General	Scheduled castes	Scheduled tribes	Child
Total	5,236	3,599	552	1,085	862
Male	2,688	1,885	268	535	454
Female	2,548	1,714	284	550	408

As of 2011 census, there are 948 females per 1000 male in the census town. Sex ratio in general caste is 909, in scheduled castes is 1060 and in scheduled tribe is 1028. There are 899 girls under 6 years of age per 1000 boys of the same age in the census town. The overall sex ratio in the census town has increased by 48 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has decreased by 96 girls per 1000 boys during the same time. A total of 3066 people in the village are literate; among them; 1771 are male and 1295 are female. Literacy rate (children under 6 are excluded) of Bongabar is 70%. 79% of male and 61% of the female population is literate here. The overall literacy rate in the census town has increased by 22%. Male literacy has gone up by 18% and the female literacy rate has gone up by 27%. Bongabar has 32% (1693) population engaged in either main or marginal works. 49% male and 15% female population are working population. 43% of the total male population is main (full-time) workers and 7% are marginal (part-time) workers. For women, 11% of the total female population is main and 4% are marginal workers.

Table 2.6.15: Percentage of the Working Population – Bongabar

	Worker	Main Worker	Marginal Worker	Non Worker
Total	32.3%	27%	5.3%	67.7%
Male	49.1%	42.6%	6.5%	50.9%
Female	14.6%	10.6%	4%	85.4%

f) Gargali

The total geographical area of Gargali village is 802 hectares. Gargali village, with a population of 1552, is Mandu sub-district's 33rd most populous village, located in Mandu sub-district of Ramgarh district in the state of Jharkhand in India. The total geographical area of Gargali village is 8 km^2 and it is the 8th biggest village by area in the sub-district. The population density of the village is 193 persons per km^2. The land-use details of the

village are presented below.

Table: 2.6.16 Land-use Details of Gargali (in Ha.)

Land-use Details of Gargali (in Ha.)	
Number of forest land	587.23
Number of government canal	0.00
Number of private canal	0.00
Well (without electricity)	1.73
Well (with electricity)	0.00
Tube-well (without electricity)	0.00
Tube-well (with electricity)	0.00
Tank	
River	
Lake	
Waterfall	
Others	
Total irrigated area	1.73
Unirrigated area	83.52
Culturable waste (including gauchar and groves)	8.65
Area not available for cultivation	121.63

The village is home to 1552 people; among them; 815 (53%) are males and 737 (47%) are females. 28% of the whole population are from general caste, 51% are from scheduled castes and 21% are scheduled tribes. Child (aged under 6 years) population of Gargali village is 15%; among them, 53% are boys and 47% are girls. There are 295 households in the village and an average of 5 persons live in every family.

Table 2.6.17: Caste-wise Male-Female Population (2011)-Gargali

	Total	General	Scheduled castes	Scheduled tribes	Child
Total	1,552	438	790	324	238
Male	815	234	408	173	127
Female	737	204	382	151	111

As of 2011 census, there are 904 females per 1000 male in the village. Sex ratio in general caste is 872, in scheduled castes is 936 and in scheduled tribe is 873. There are 874 girls under 6 years of age per 1000 boys of the same age in the village. The overall sex ratio in the village has decreased by 58 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has increased by 8 girls per 1000 boys during the same time. A total of 838 people in the village are literate; among them, 530 are males and 308 are females. Literacy rate (children under 6 are excluded) of Gargali is 64%. 77% of male and 49% of the female population are literate here. Overall literacy rate in the village has increased by 17%. Male literacy has gone up by 11% and the female literacy rate has gone up by 22%. Gargali has 41% (638) population engaged in either main or marginal works. 46% male and 36% female population are working population. 37% of the total male population are main (full-time) workers and 9% are marginal (part -time) workers. For women 15% of the total female population are main and 21% are marginal workers.

Table 2.6.18: Percentage of the Working Population – Gargali

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	41.1%	26.4%	14.7%	58.9%
Male	45.8%	36.6%	9.2%	54.2%
Female	36%	15.2%	20.8%	64%

g) Dainmari

The total geographical area of Dainmari village is 671 hectares. Dainmari Village, with a population of 273 is Ghatshila sub-district''s 45th least populous village, located in Ghatshila sub-district of Purbi Singhbhum district in the state of Jharkhand in India. The total geographical area of Dainmari village is 7 km^2 and it is the 4th biggest village by area in the sub-district. The population density of the village is 41 persons per km^2. The land-use details of the village are presented below.

Table 2.6.19: Land-use Details of Dainmari (in Ha.)

Land-use Details of Dainmari (in Ha.)	
Number of forest land	0.43
Number of government canal	0.00
Number of private canal	0.00
Well (without electricity)	0.00
Well (with electricity)	0.00
Tube-well (without electricity)	0.00
Tube-well (with electricity)	0.00
Tank	1.65
River	0.00
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	1.65
Unirrigated area	122.20
Culturable waste (including gauchar and groves)	401.17
Area not available for cultivation	145.53

The village is home to 273 people, among them 139 (51%) are males and 134 (49%) are females. 52% of the whole population are from general caste and 48% belong to scheduled tribes. Child (aged under 6 years) population of Dainmari village is 14%; among them, 46% are boys and 54% are girls. There are 46 households in the village and an average of 6 persons live in every family.

Table 2.6.20: Caste-wise Male-Female Population (2011)-Dainmari

	Total	General	Scheduled castes	Scheduled tribes	Child
Total	273	141	0	132	37
Male	139	71	0	68	17
Female	134	70	0	64	20

As of 2011 census, there are 964 females per 1000 males in the village. Sex ratio in general caste is 986, and scheduled tribe is 941. There are 1176 girls under 6 years of age per 1000 boys of the same age in the village. The overall sex ratio in the village has increased by 24 females per 1000 male during the years from 2001 to 2011. Child sex

ratio here has increased by 76 girls per 1000 boys during the same time. A total of 126 people in the village are literate; among them, 77 are male and 49 are female. Literacy rate (children under 6 are excluded) of Dainmari is 53%. 63% of male and 43% of the female population is literate here. The overall literacy rate in the village has increased by 9%. Male literacy has gone down by 0% and the female literacy rate has gone up by 20%. Dainmari has 54% (147) population engaged in either main or marginal works. 53% male and 55% female population are working population. 27% of the total male population are main (full time) workers and 26% are marginal (part-time) workers. For women 1% of the total female population are main and 54% are marginal workers.

Table 2.6.21: Percentage of Working Population – Dainmari

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	53.8%	14.3%	39.6%	46.2%
Male	52.5%	26.6%	25.9%	47.5%
Female	55.2%	1.5%	53.7%	44.8%

h) Geruara

The total geographical area of Geruara village is 498 hectares. Geruara village, with a population of 1582v is Patamda sub-district's 15th most populous village, located in Patamda sub-district of Purbi Singhbhum district in the state of Jharkhand in India. The total geographical area of Geruara village is 5 km^2 and it is the 16th biggest village by area in the sub-district. Population density of the village is 318 persons per km^2. The land-use details are presented below.

Table 2.6.22: Land-use Details of Geruara (in Ha.)

Land-use Details of Geruara (in Ha.)	
Number of forest land	0.00
Number of government canal	0.00
Number of private canal	0.00
Well (without electricity)	0.00
Well (with electricity)	0.00
Tube-well (without electricity)	0.00
Tube-well (with electricity)	0.00
Tank	9.30
River	0.00

Land-use Details of Geruara (in Ha.)	
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	9.30
Unirrigated area	294.15
Culturable waste (including gauchar and groves)	90.25
Area not available for cultivation	104.59

The village is home to 1582 people; among them; 787 (50%) are males and 795 (50%) are females. 54% of the whole population are from general caste, 13% are from scheduled castes and 33% are scheduled tribes. Child (aged under 6 years) population of Geruara village is 16%, among them 58% are boys and 42% are girls. There are 309 households in the village and an average of 5 persons live in every family.

Table 2.6.23: Caste-wise Male-Female Population (2011)-Geruara

	Total	General	Scheduled castes	Scheduled tribes	Child
Total	1,582	858	207	517	253
Male	787	427	95	265	147
Female	795	431	112	252	106

As of 2011 census, there are 1010 females per 1000 male in the village. Sex ratio in general caste is 1009, in Scheduled castes is 1179 and in scheduled tribe is 951. There are 721 girls under 6 years of age per 1000 boys of the same age in the village. Overall sex ratio in the village has increased by 9 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has decreased by 332 girls per 1000 boys during the same time. A total of 757 people in the village are literate; among them, 474 are male and 283 are female. Literacy rate (children under 6 are excluded) of Geruara is 57%. 74% of male and 41% of the female population is literate here. Overall literacy rate in the village has increased by 6%. Male literacy has gone down by -1% and female literacy rate has gone up by 14%. Geruara has 59% (936) population engaged in either main or marginal works. 57% male and 61% female population are working population. 29% of the total male population are main (full time) workers and 28% are marginal (part-time) workers. For women 3% of the total female population are main and 58% are marginal workers.

Table 2.6.24: Percentage of Working Population – Geruara

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	59.2%	16.1%	43%	40.8%
Male	57.2%	29.5%	27.7%	42.8%
Female	61.1%	2.9%	58.2%	38.9%

The profile of sample villages provides the following inferences:

- Rainfed agriculture is predominant as most of the rural households in these sample villages primarily dependant on agriculture and allied activities, whose cash flows are uncertain and uneven.
- More or less 85 per cent of the cultivated area in sample villages is unirrigated in nature.
- The female working population is much higher in the sample villages as women who constitute more than 68 per cent of the workforce and their main source of income is agriculture and allied activities.
- Diversification of cropping pattern is absent.
- A large portion of the area is under either cultural waste or area not available for cultivation.
- There is a considerable composition of scheduled caste and scheduled tribe population in sample villages. It is observed through focus group discussions that nutritional deficiency is higher among women from rural areas, illiterate, low income, SCs and STs.
- About 42 per cent of women in the reproductive age are anaemic (household-level vulnerability).
- Indebtedness is also very high in our sample villages, especially the farming households having loan balance.

CHAPTER-3
RESULTS AND DISCUSSION

3.1 Sustainable Livelihoods Practices

Based on the past experiences which have been discussed in length in Chapter 1 by the implementation of several anti-poverty programmes and involvement of various stakeholders, especially proactive involvement of the poor community on self-help mode and collaborative effort by government, civil society organisation and markets have made positive results in the process of poverty alleviation, effective and sustainable in sample villages of Jharkhand and Karnataka states.

Mahila Kisan Sashaktikaran Pariyojana (MKSP)

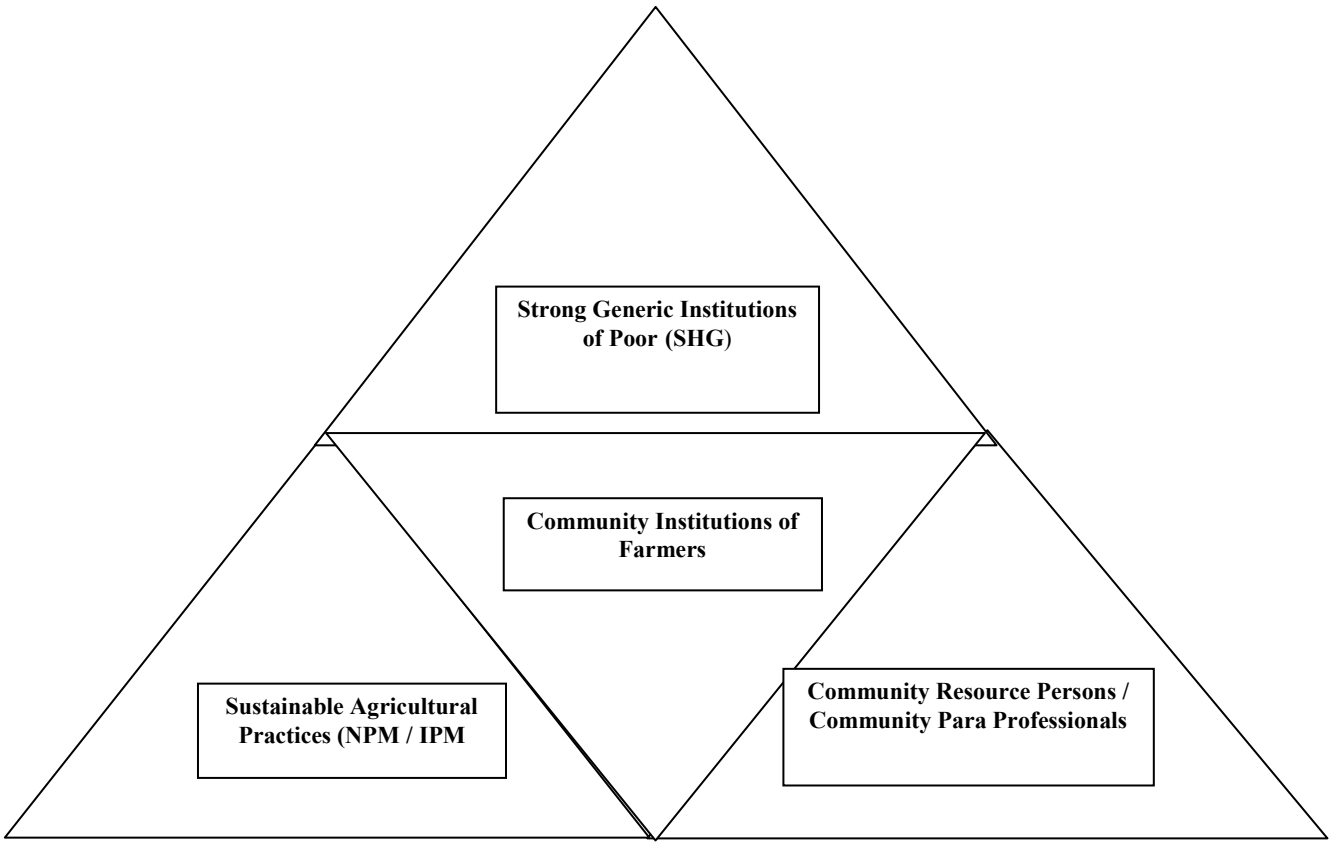
The primary objectives of the MKSP are to empower women in agriculture by making systematic investments to enhance their participation and productivity, and also create and sustain agriculture-based livelihoods of rural women. By establishing efficient local resource-based agriculture wherein women in agriculture gain more control over the production resources and manage the support systems, the project seeks to enable them to gain better access to the inputs and services provided by the government and other agencies. Once the production capacities of women in agriculture improve, food security ensues for their families and communities.

Approach: MKSP implemented as a sub-component of NRLM through specially formulated projects. Initiate a learning cycle by which women are enabled to learn and adopt appropriate technologies and farming systems.

Strategy: The Project Implementing Agency (PIA) under MKSP is expected to follow the below-mentioned strategy:

- Use of locally adopted, resource-conserving, knowledge-centric, farmer-led and environment-friendly technologies
- Coordinated action by communities and community-based institutions such as the women self-help groups, their federations, NGOs and farmer groups, farm schools, farmer field schools and others

- Inculcating community mobilisation skills among women in agriculture thereby demonstrating and articulating the benefits of the sustainable agricultural methods to them.
- The MKSP focus is to enhance the skill base of the women in agriculture to enable them to pursue their livelihoods on a sustainable basis. Capacity building of women and skill upgradation through handholding, formal and vocational courses is emphasised.
    - The MKSP is strategised in a manner to target the Poorest of the Poor and most vulnerable women such as SC/ST, minorities, landless and the Primitive Tribal Groups.
    - While identifying the target group, priority is given to women-headed households (single women), resource-poor households, and women groups engaged in agriculture and allied activities (promotion, production, processing and marketing)
    - Participatory approaches and bottom-up planning constitute the core values of the MKSP. The framework is as follows.



The present study assessed these aspects while analysing the data.

The interventions include project design (Mahila Kisan Sashaktikarana Pariyojana - MKSP) and implementation was based on the following non-negotiable principles.

- Transparency in decision-making through the participation of farm women and their CBOs
- Inclusiveness include poorest of the poor and most vulnerable women such as SC/ST, minorities and landless
- Sustainability- inbuilt continuous processes, livelihood technologies, institutions on self-help and entrepreneurial mode
- The processes focus to a saturation level and bring in a sustainable scale of operations
- Convergence -integrate for the most efficient use of resources
- Conservation of natural resources

In view of the above principles, the activities taken up in sample villages were as follows.

1. Organisation of the groups of poor and farm women and enhanced their capacities to function on self-help and entrepreneurial culture.
2. Imparted skills and capabilities of farm women in sustainable agriculture and non-agriculture livelihoods
3. Enhanced their participation and productivity in agriculture
4. Effective access to knowledge, technology, inputs, entitlements and institutional financial services (Bank Linkage) for the advancement of sustainable farming
5. Engaged in value chains and market access
6. Enabled them access to drudgery reduction technologies to enhance the quality of life
7. Enabled voice and proactive action by women in managing family and community assets, its conservation and development.

Keeping in view, the study relied on household livelihood sustainability analysis framework (as discussed in Chapter 1) wherein the following integrated multiple livelihoods approach has been addressed (by NGO-PIAs) in our two sample States.

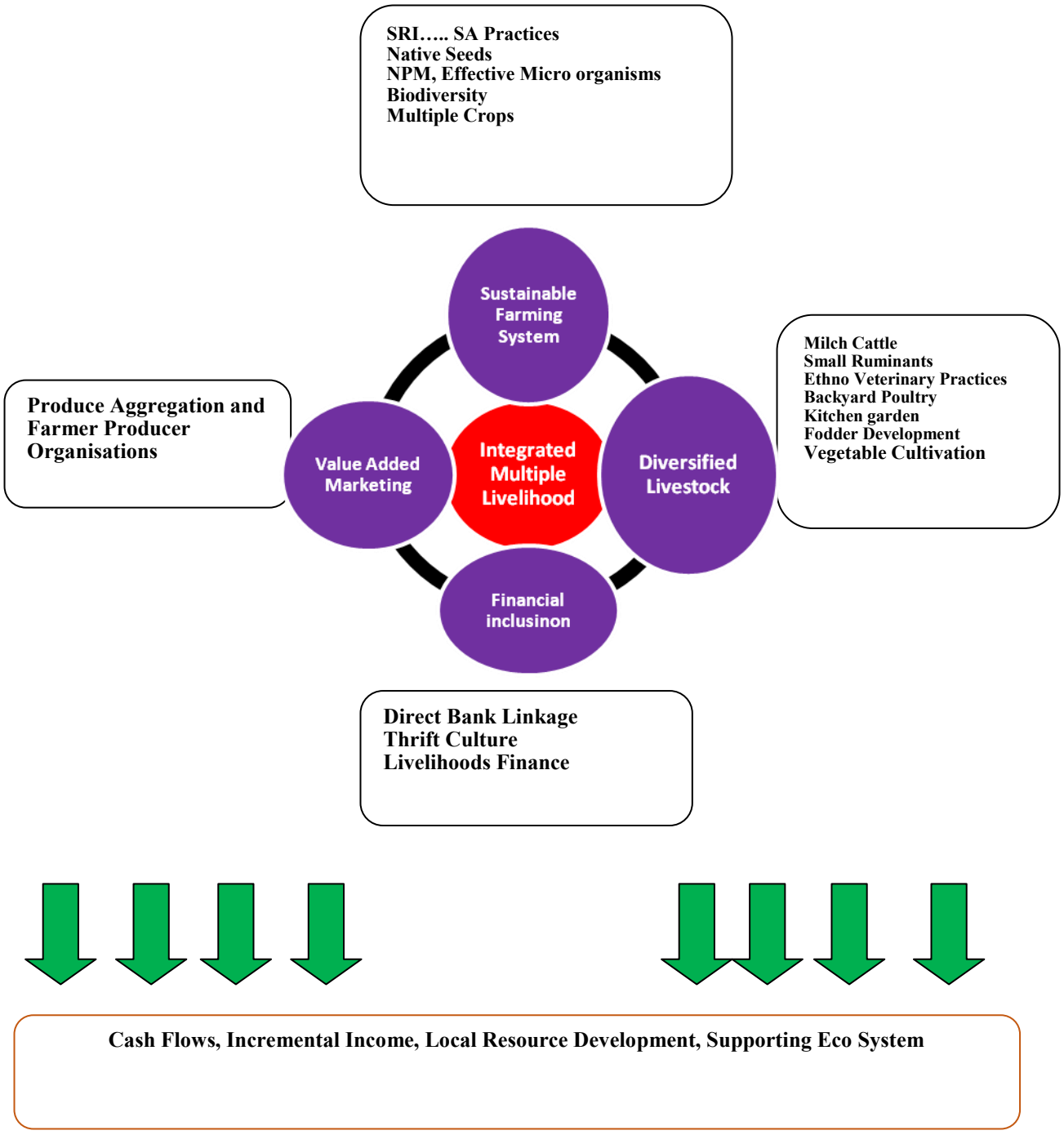


Figure 3.1.1: Integrated Multiple Livelihoods Approach

For effective delivery, dissemination of knowledge and skill in sustainable technologies, best practices, SHG capacity development training programmes, the following institutional arrangements were created in villages of our two sample States.

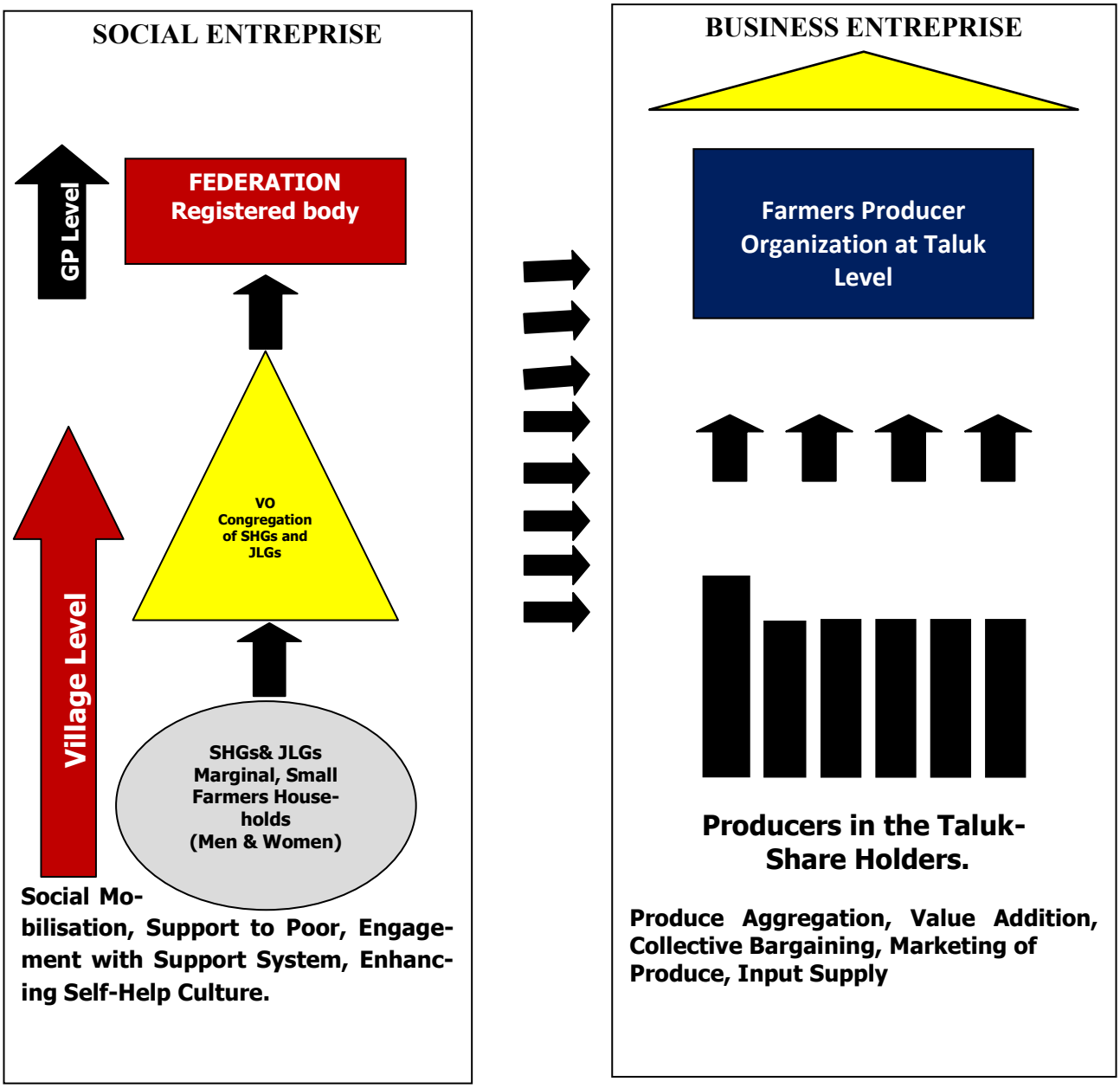


Figure 3.1.2: Institutional Arrangements in Sample Villages

The stringent efforts were made by the partner organisations (NGO-PIAs) for nurturing of self-help groups lead to changes in women's access to finance and change their decision-making towards the development and management of resources sustainably. These SHGs have taken leadership positions, starting from economic empowerment to leadership in larger social and political domains as well as changes in

their perceptions and identities towards positive development in sample villages of both the States.

The integrated multiple livelihoods approach and appropriate institutional arrangements have made a visible impact on the increase of employment, income and thereby nutritional security among households in sample villages of Jharkhand and Karnataka States. The data collected for the study is analysed through suitable descriptive techniques like tabulation and graphs. In addition to the descriptive techniques, inferential technique, i.e. Pearson Correlation Technique, is used to explore the nature and strength of the relationship that exists among various variables of the study.

3.2 Observations

Previously, the majority (45% in Karnataka and 50% in Jharkhand) of our sample respondents found their livelihood in labouring activities; about 38% and 23% of the sample respondents in Karnataka and Jharkhand, respectively, engaged in subsistence farming for the living and 17% of the sample in Karnataka and 27% of the sample in Jharkhand migrated to various places to find work (see Figure 3.2.1). It is evident from the figure that the role of subsistence farming as a second major occupation in Karnataka has lost its sheen in Jharkhand and occupied third major occupation in the State.

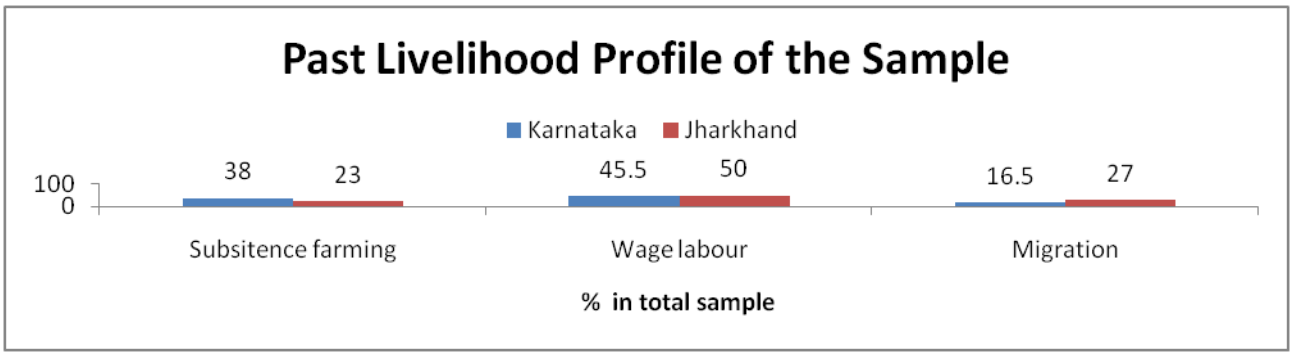


Figure 3.2.1: Past Livelihood Profile of the Sample

Over the years, the livelihood options of sample respondents in both States have widened. Presently, the livelihood of sample respondents spreads across various activities like agriculture, vegetable cultivation, horticulture, livestock rearing, small ruminants rearing, backyard poultry rearing, kitchen garden, tailoring, pickle making and mushroom cultivation. In Karnataka, a major share of the sample (20.5%) is being involved in

backyard poultry and vegetable cultivation and significant share of the sample (15.5) and very least share of the sample respondents (3.5%) are doing tailoring for securing their subsistence needs. Whereas, in Jharkhand, majority of the sample (26.5) are cultivating horticulture crops and vegetables for subsistence and 16.5% sample also involved in other agriculture activities. Only 2.5% of the sample is being engaged in mushroom cultivation.

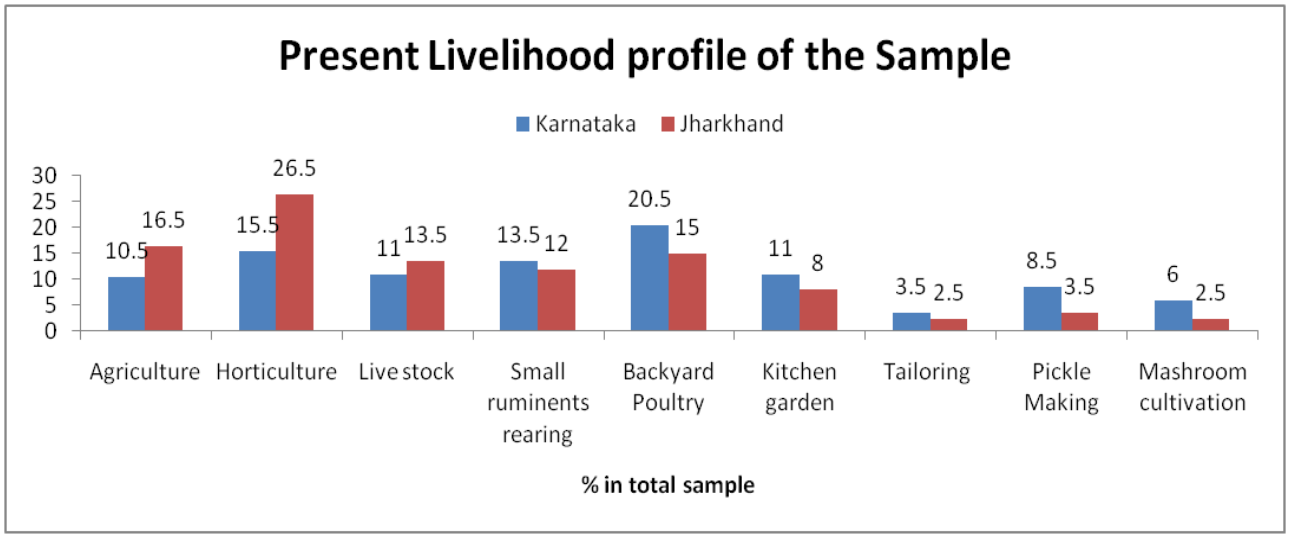


Figure 3.2.2: Present Livelihood Profile of the Sample

The average gross revenues of sample respondents during the triennium period before the capacity building indicate that there has been a great variation across the earning capacities of the sample in both States. In Karnataka, majority (59.5%) of them secured gross revenues ranging between Rs. 85,900 - Rs. 87,100. 33.5% of the sample respondents earned gross revenues between Rs. 87,101- Rs. 88,200. Whereas 7.5% of sample respondents' gross revenues exceed Rs. 88,200 (see figure). In Jharkhand, majority in the sample (44.5) triennium average gross revenues in the past ranges between Rs. 52,788 - Rs. 53,587 and 35.5% sample respondents' quoted their revenues that fall between Rs. 51,987 - Rs. 52,787, whereas the remaining 20% of the sample proportions represent a high earning group whose average gross revenues exceeds Rs. 53,588 per annum.

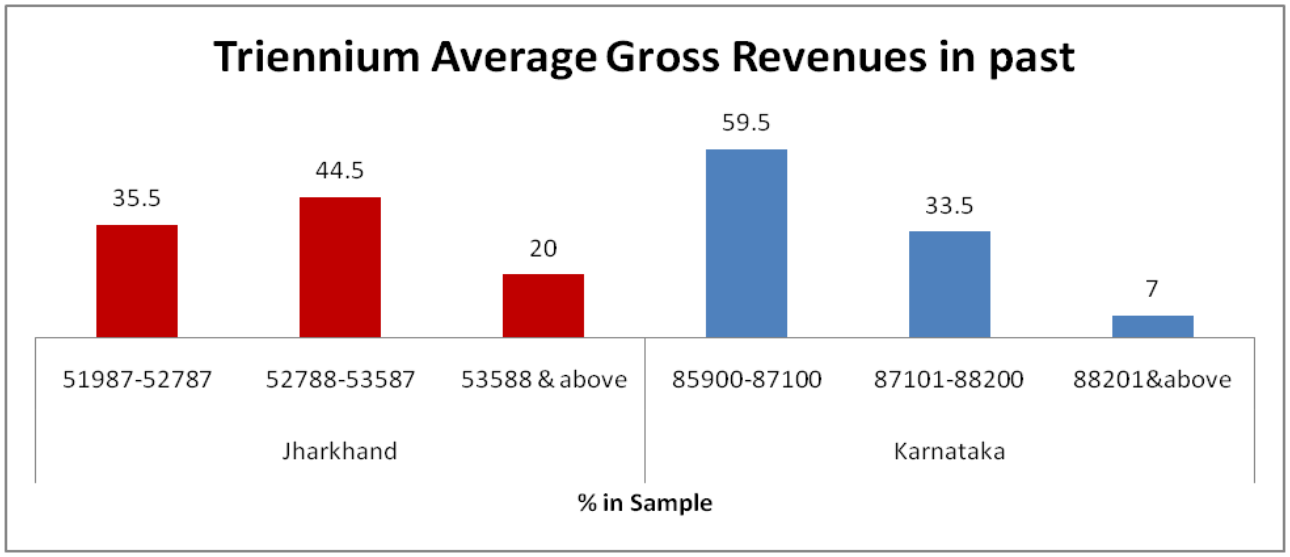


Figure 3.2.3: Triennium Average Gross Revenue in the Past

Interestingly, all the respondents in Karnataka and Jharkhand claimed that their reported triennium average gross revenues are lesser than the long-period average gross revenues.

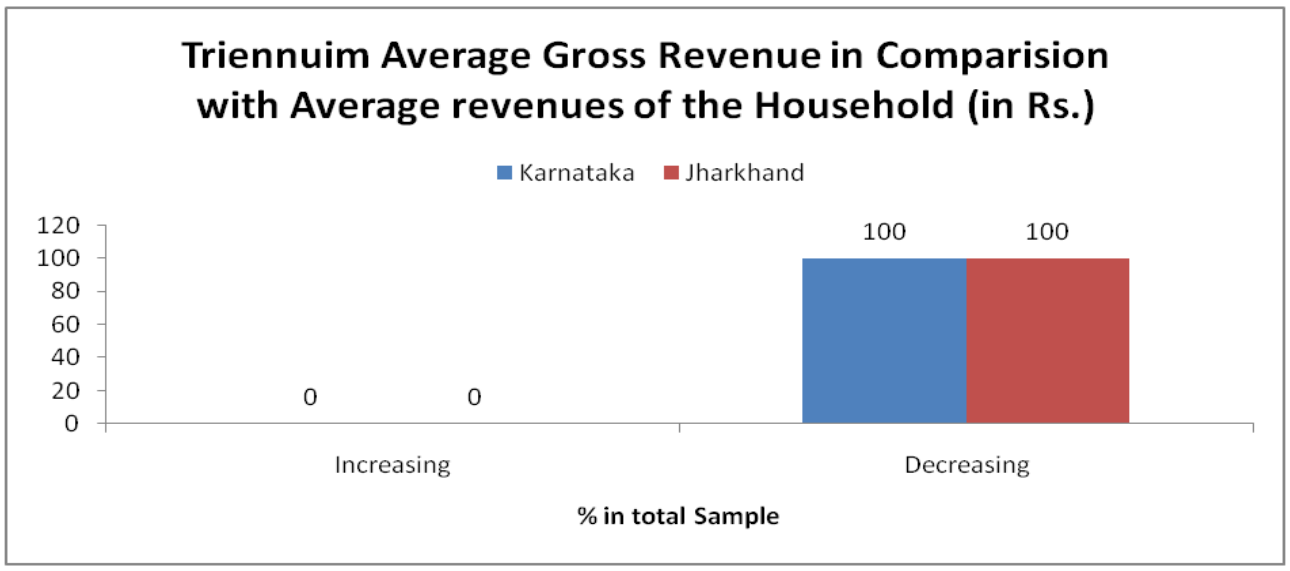


Figure 3.2.4: Triennium Average Gross Revenue in Comparison with Average Revenues of the Household (in Rs.)

As has reported in the gross revenues, the triennium average net income has also shown a great variation across sample respondents in both States. In Karnataka, majority of the sample respondents (67%) earned net income of Rs. 62,201- Rs. 63,300 during the triennium before the capacity building. Among the sample, 29% earned their triennium average net income more than Rs. 63,300. In Jharkhand, the average net income of majority (49%) of the sample respondents was between Rs. 22,680-23,479 and 26% of the sample reported their high earning category where the income exceeds Rs. 23,480 per annum.

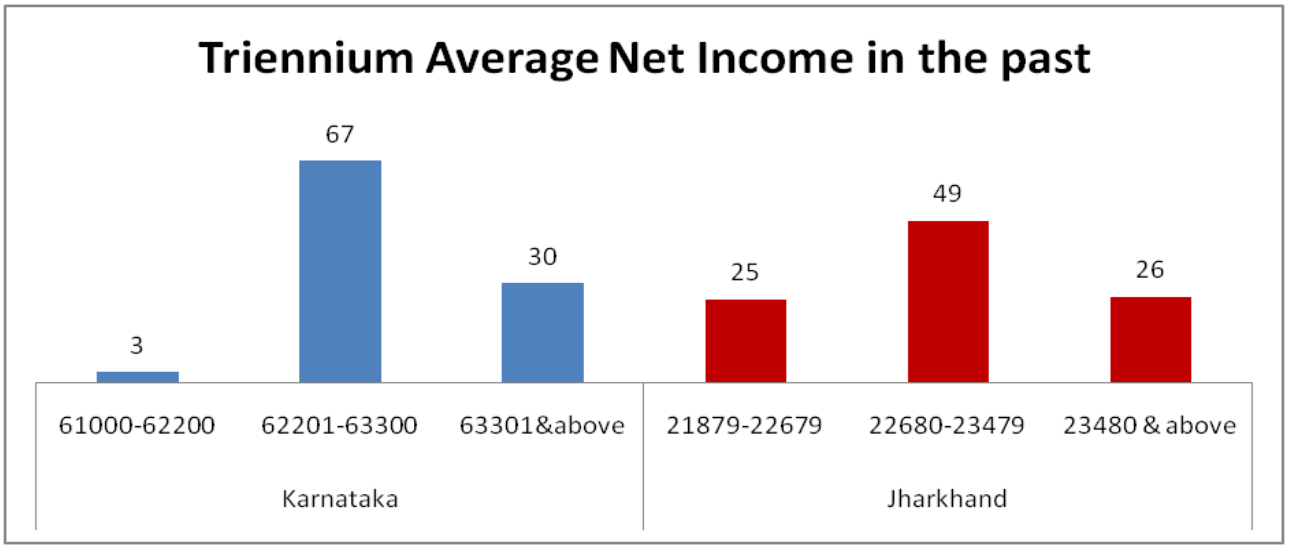


Figure 3.2.5: Triennium Average Net Income in the Past

As similar to the triennium average gross revenues, all the respondents expressed that their triennium average net income is lower than the long-period average net income.

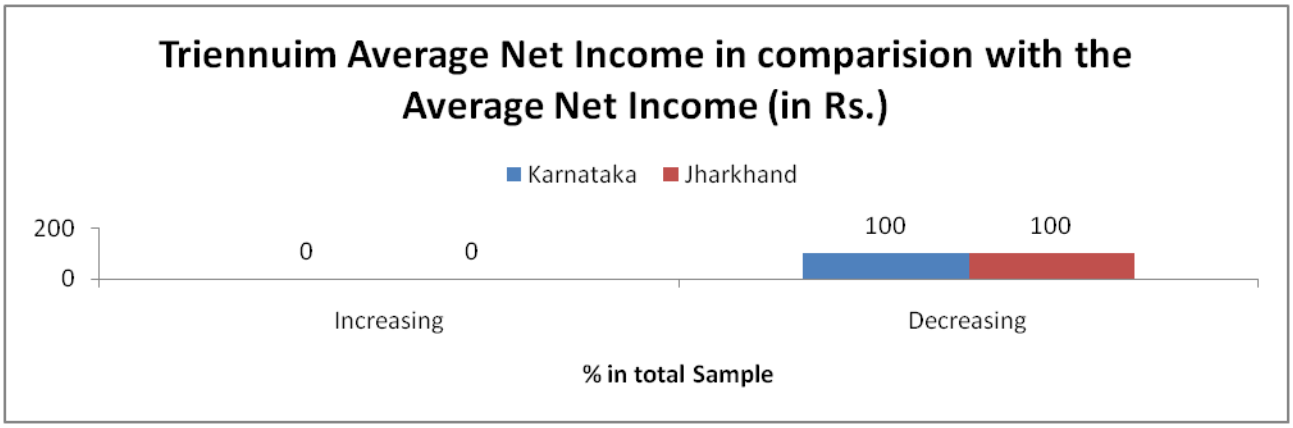


Figure 3.2.6: Triennium Average Net Income in comparison with Average Net income

It is also observed that the trend of net income flow has declined over the years. All the respondents of the study reported this declining trend in relation to the flow of their annual net income in preceding years.

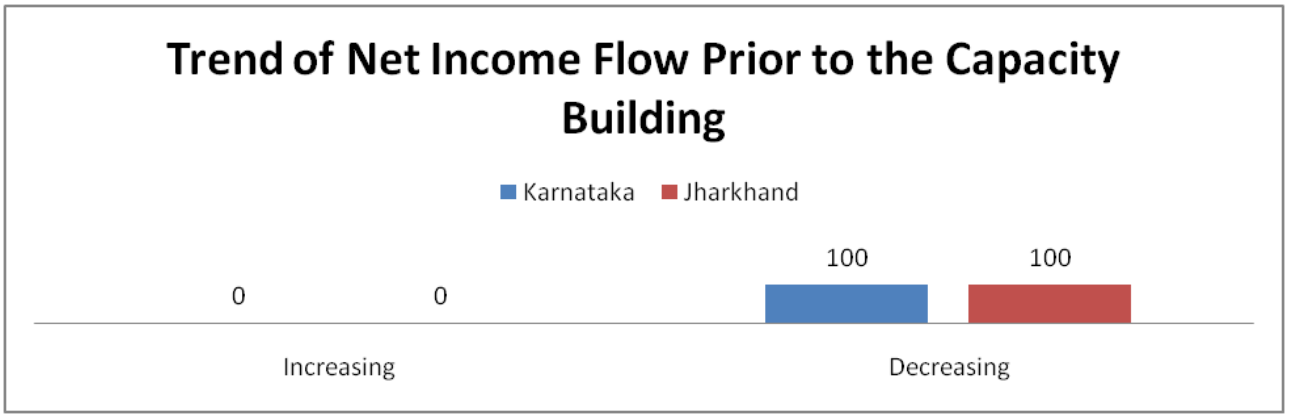


Figure 3.2.7: Trend of Net Income Flow prior to the Capacity Building

Various reasons have contributed to this declining trend in household net income. Among those primary reasons, 35.5% of Jharkhand and 33% of Karnataka sample respondents perceived avoidance of agroforestry system in crop production as a major cause for this declining trend. Whereas 23% of the sample respondents in both States perceived that unproductive agricultural land was the major cause for the decline in their annual net income. Another 19.5% in Karnataka and 15.5% in Jharkhand sample respondents stated that the lack of sufficient skills and knowledge led their net income levels to fall over the years. The state of poor resource endowment was considered as the cause for the decline in annual net income by 13.5% and 11% sample respondents in Karnataka and Jharkhand States, respectively. On the other hand, 15% of Jharkhand sample respondents and 11% of Karnataka sample respondents perceived non-remunerative nature of their holding resources as the reason for the decline in net income.

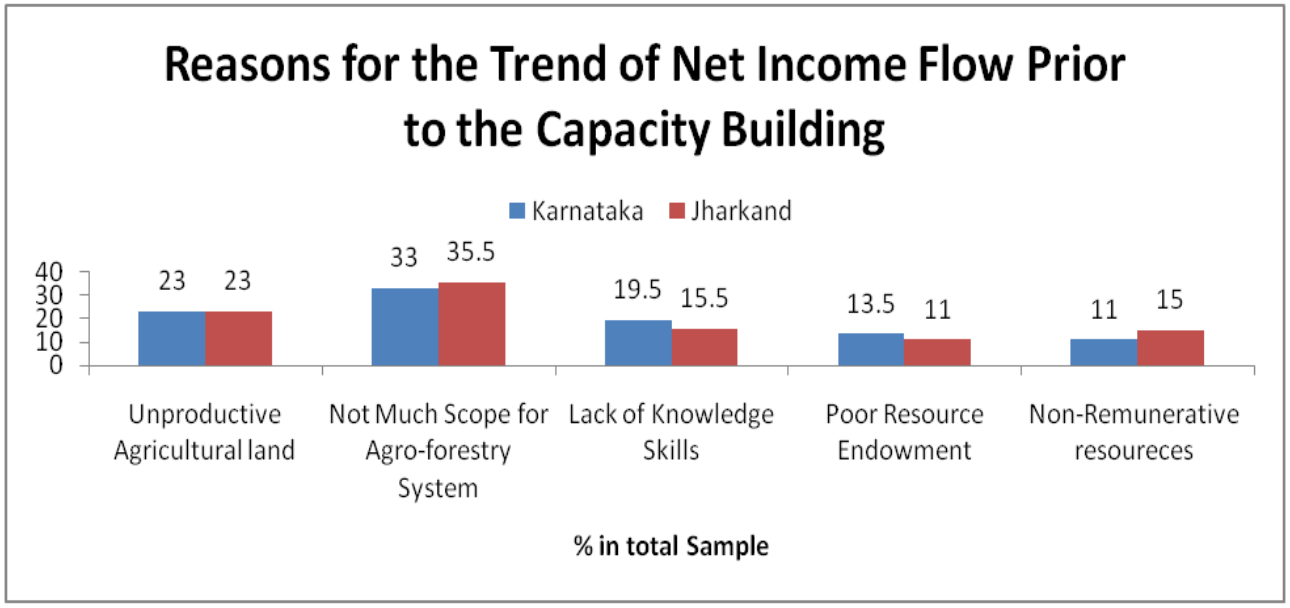


Figure 3.2.8: Reasons for the Trend of Net Income Flow prior to the Capacity Building

It is widely acknowledged that the people pursue any livelihood as long as they are managing to get support for their subsistence from such livelihoods. The length of the period within which an individual pursuing a certain livelihood is an indicator of the strength of the livelihood in satisfying individuals' subsistence needs. It is observed that majority of the sample respondents (39.5% in Karnataka and 42% in Jharkhand) reported that they have been pursuing the same livelihood for around 23-28 years, whereas only 14.5 % sample respondents in Karnataka and 14% in Jharkhand expressed that they have been pursuing the present livelihood for more than 34 years.

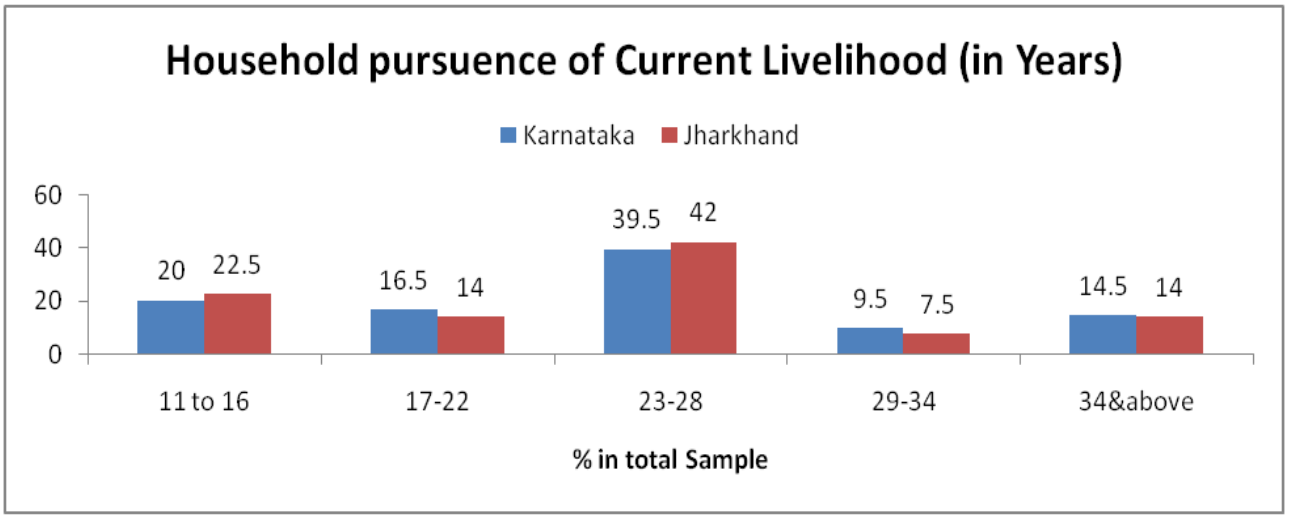


Figure 3.2.9: Household Pursuance of Current Livelihood

It is observed that majority of the sample, i.e. 85% in Karnataka and 92.5% in Jharkhand, believed that their livelihood has been duly recognised by the fellow members in the society.

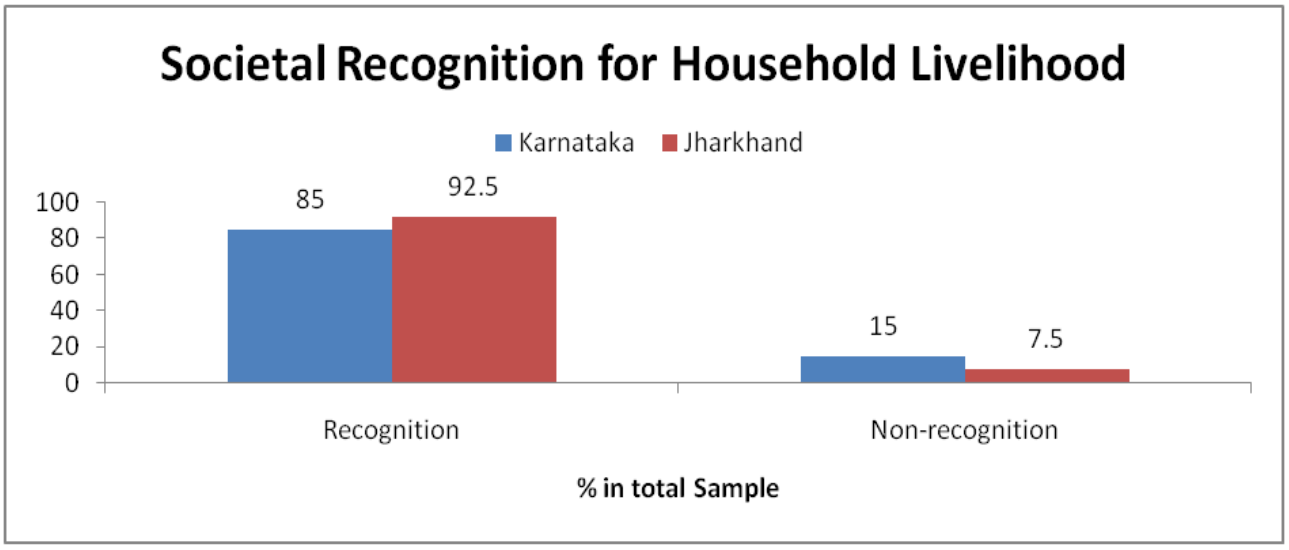


Figure 3.2.10: Societal Recognition for Household Livelihood

The relative social recognition of any livelihood determines the individuals' choice of selecting or pursuing any livelihood for their subsistence. It is observed that majority of the sample respondents (35.5% in Jharkhand and 36.5% in Karnataka) perceived that their livelihood is having social value, whereas 6% sample in Karnataka and 10.5% sample in Jharkhand expressed that their livelihood possesses marginal value. A significant proportion of the sample (27.5% in Karnataka and 36.5% in Jharkhand) perceived that their livelihood has very high social value. On the other hand, 15.5% of the sample in Karnataka and 14% in Jharkhand rated the value of their livelihood social value as very less.

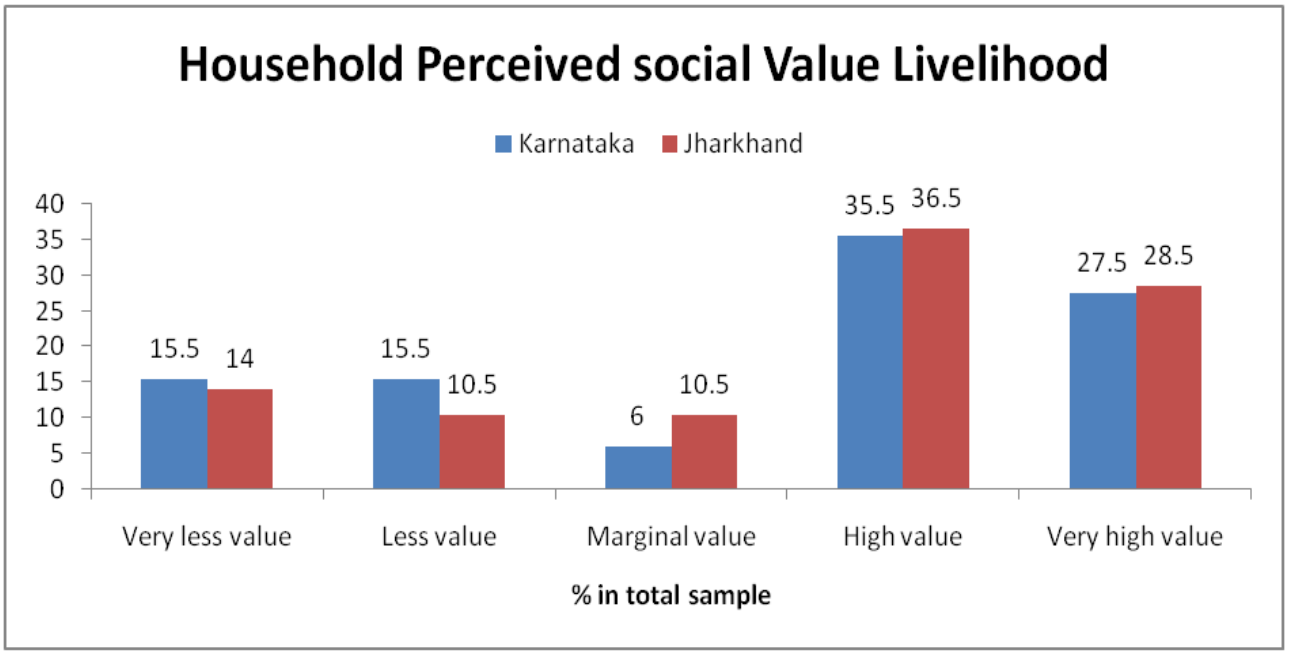


Figure 3.2.11: Household Perceived Social Value Livelihood

Despite the variations in the perceived social value of the livelihood, all the respondents in both States believed that over the years there has been an increasing trend in terms of social recognition towards their respective livelihoods.

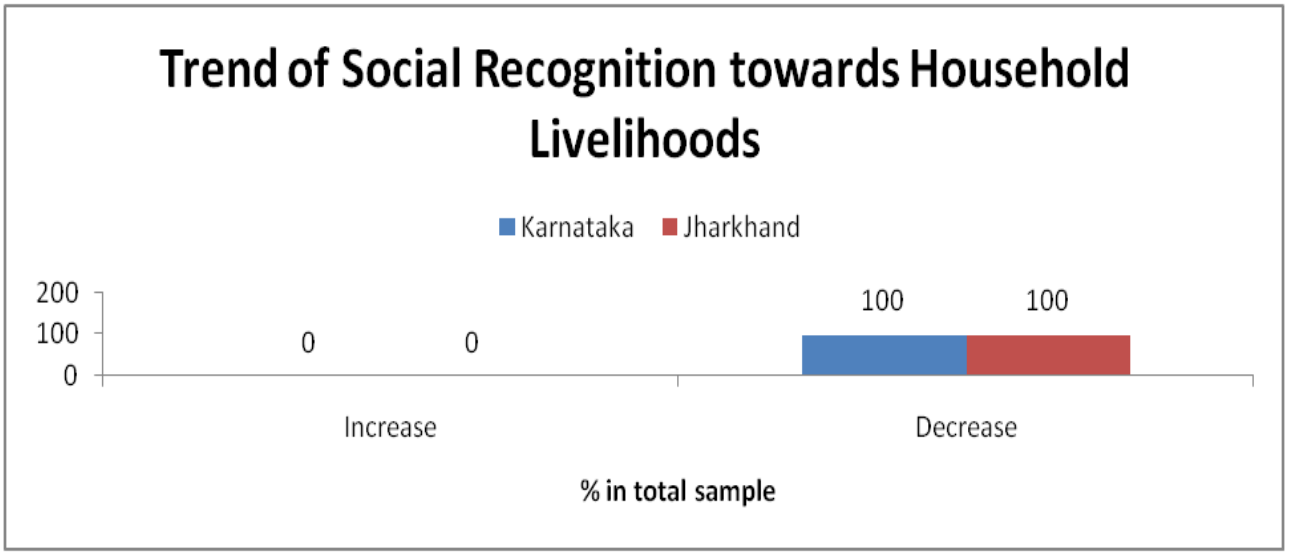


Figure 3.2.12: Trend of Social Recognition towards Household Livelihoods

The rate of trend change in social value towards the social value of the respondents' livelihood is differently perceived by sample respondents. Among the respondents, 30% of the sample in both States perceived that the rate of trend change is very high, whereas 5.5% in Jharkhand and 13% in Karnataka States perceived this trend change as a very low rate. Majority of the sample respondents, i.e. 31.5% in Karnataka and 42.5% in Jharkhand perceived the rate of trend changes as high.

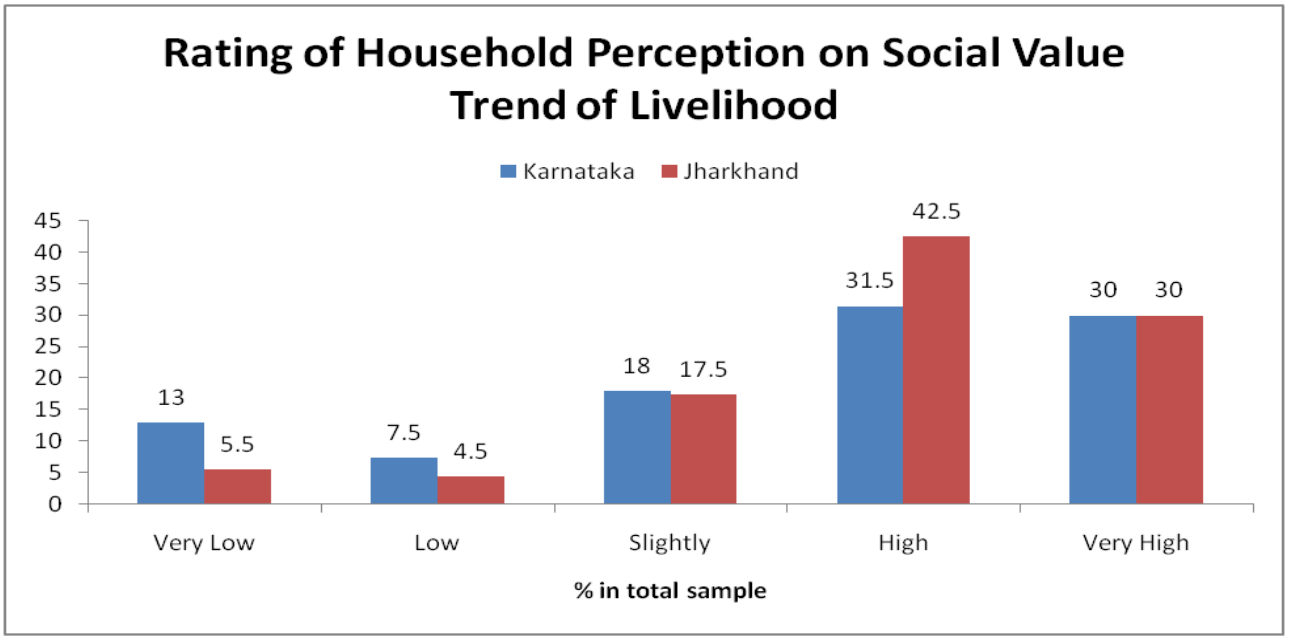


Figure 3.2.13: Rating of Household Perception on Social Value Trend of Livelihood

During the survey, various respondents perceived various reasons as the cause of the declining trend of social value in the past. The reasons include lack of access to resources, lack of political power and representation, beliefs and customs, building stock and age, conflicts, lack of operation and lack of exposure. In Karnataka, majority of the sample (19%) of the sample respondents felt that the beliefs and customs as the major cause of the declining trend and a minor proportion of the sample (10%) perceived lack of exposure as the major cause for declining trend. In Jharkhand, majority of the sample (27%) believed that lack of political power and representation as the major cause for declining trend and a minor proportion of the sample (4.5%) believed that exposure as the major cause of this declining trend.

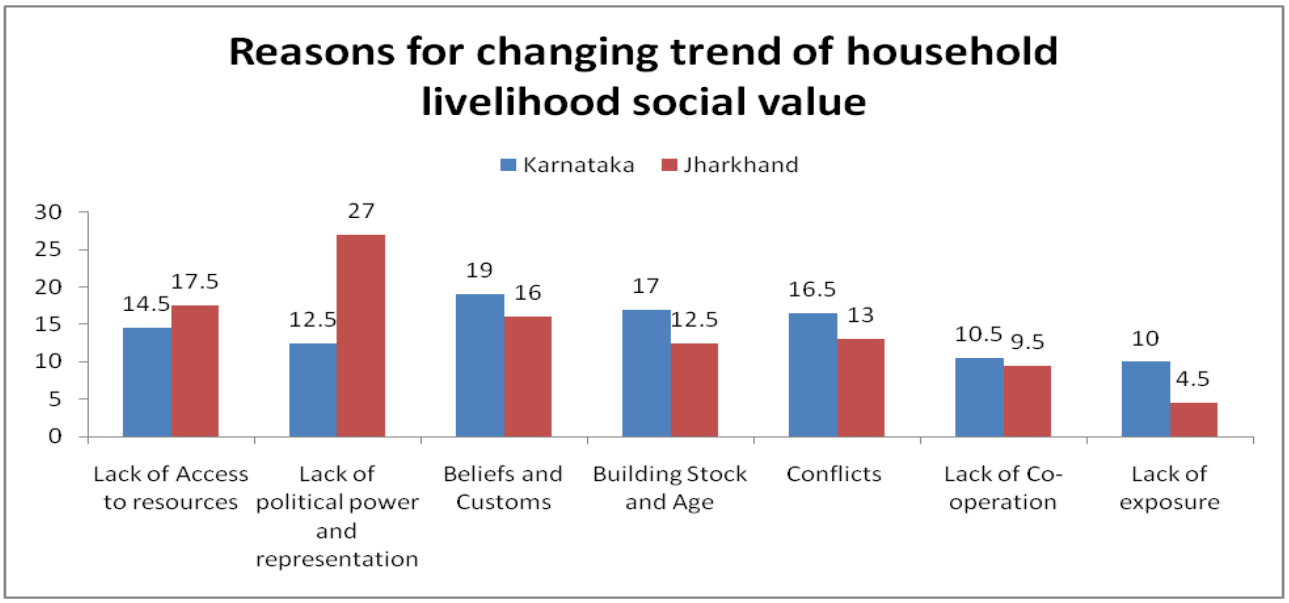


Figure 3.2.14: Reasons for Changing Trend of Household Livelihood Social Value

The sample respondents of the study expressed that their livelihood options have been vulnerable to climatic extremes. During the survey, they have reported various climatic challenges like rising temperature, change in rainfall, depletion of groundwater, degradation of resources, soil erosion and frequent droughts. Majority of the sample (37.5% in Karnataka and 31.5% in Jharkhand) believed that change in rainfall pattern has been a major challenge for their livelihood. On the other hand, very few respondents (7% in Karnataka and 10% in Jharkhand) believed that frequent drought has been the major challenge for their livelihood.

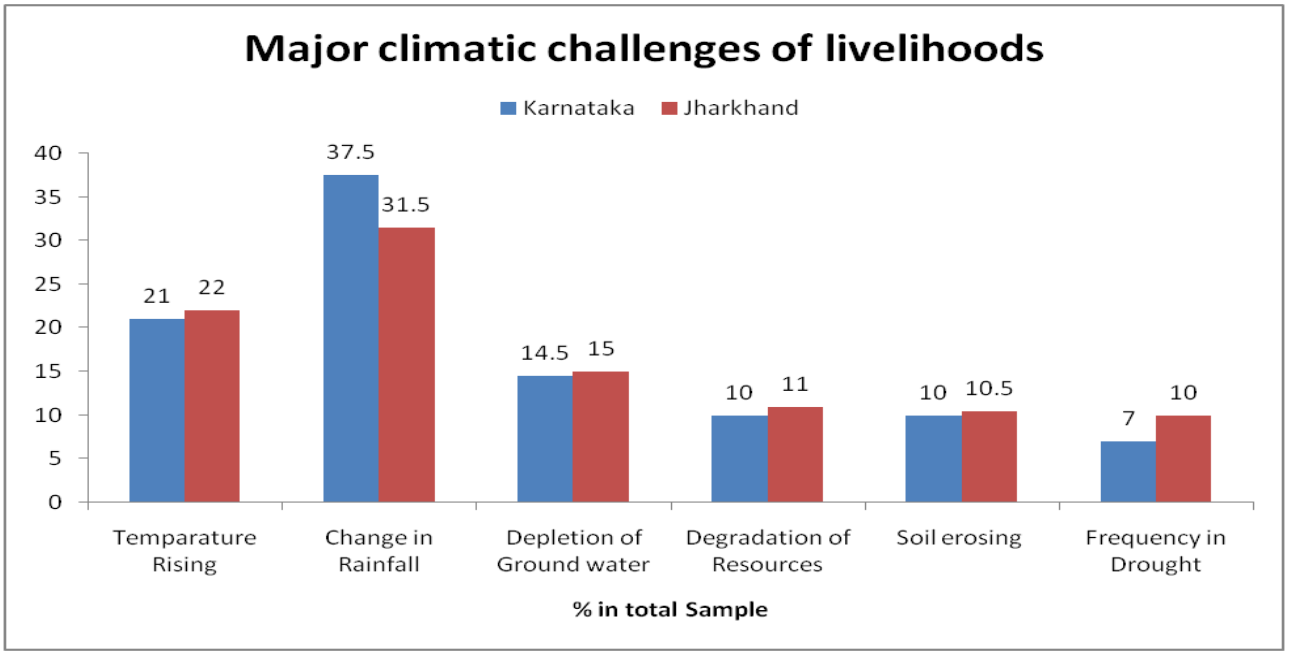


Figure 3.2.15: Major Climatic Challenges of Livelihoods

It is also observed that all the respondents of the study agreed that they have been regularly suffered from above-quoted climatic challenges while pursuing their livelihood.

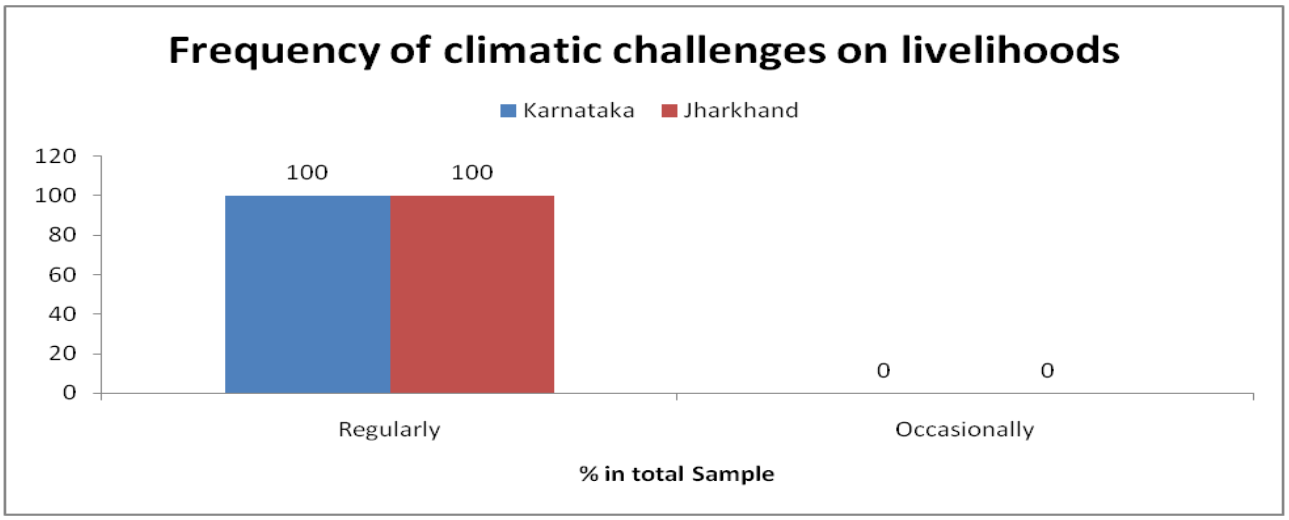


Figure 3.2.16: Frequency of Climatic Challenges on Livelihoods

All the respondents of the study also unanimously agreed that the occurrence of climatic extremes is ever-increasing and questioning the sustainability of their livelihood.

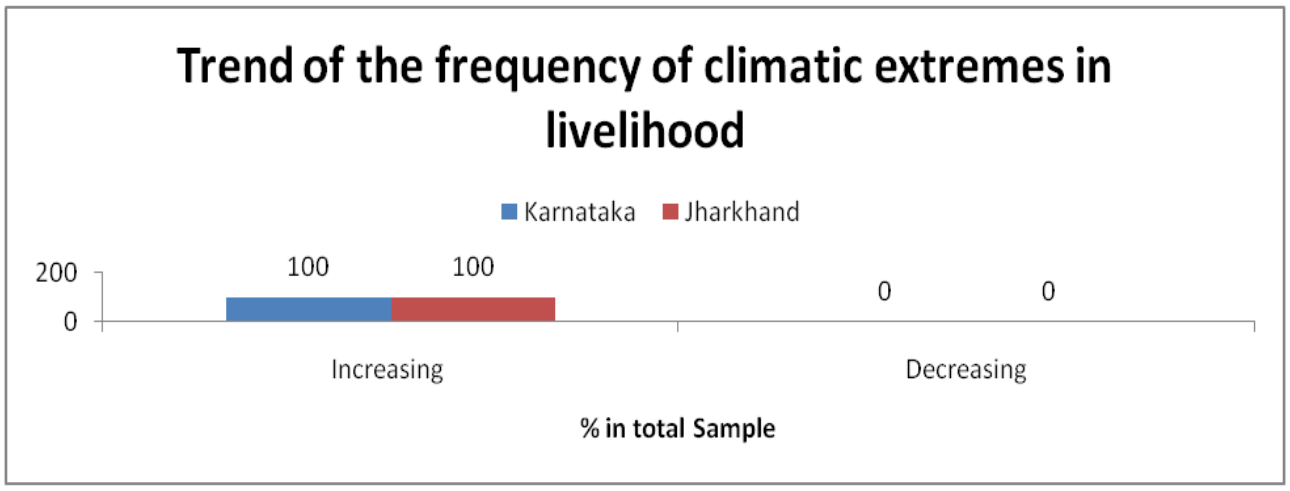


Figure 3.2.17: Trend of the Frequency of Climatic Extremes in Livelihood

It is observed that the vulnerability level of the livelihood was varyingly perceived by the respondents. Majority of the respondents (31.5% in Karnataka and 39% in Jharkhand) perceived the vulnerability level of their livelihood towards climatic extremes as high. Whereas the 14% sample in Karnataka and 8% sample in Jharkhand perceived their livelihood was less vulnerable to the climatic extremes.

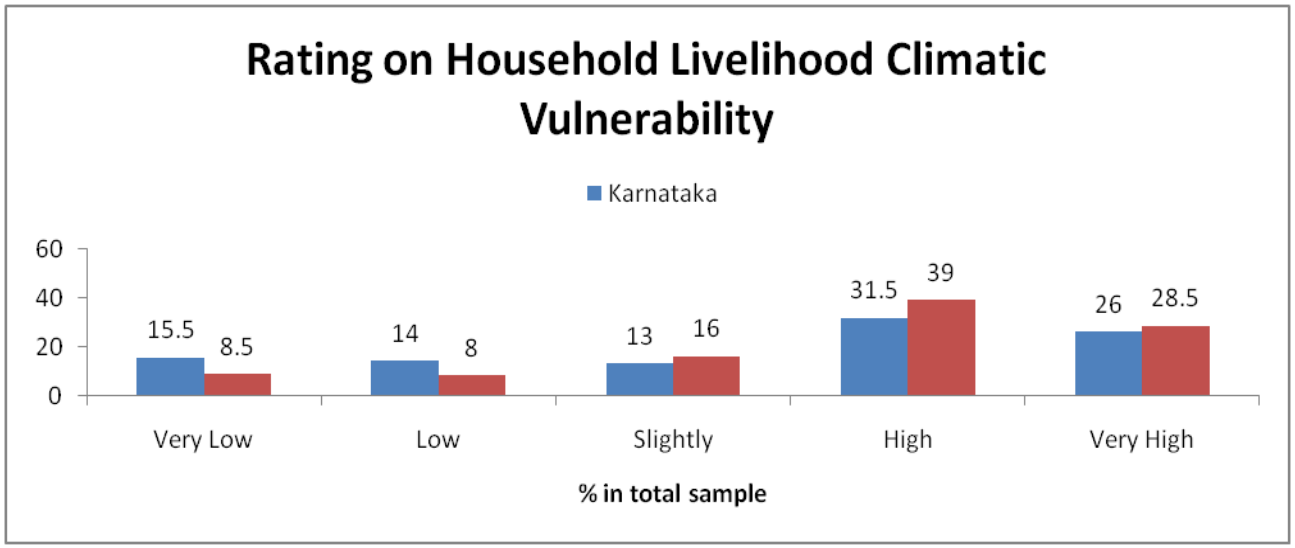


Figure 3.2.18: Rating on Household Livelihood Climatic Vulnerability

While interacting with the respondents in Karnataka, 37.5% of sample respondents perceived that fluctuations in crop productions, 33.5% respondents perceived land degradation, 15% perceived evapotranspiration, 7.5% perceived reduced availability of firewood and fodder and 6.5% perceived inefficient water management as the major reasons for vulnerability trend of their livelihood towards climatic extremes.

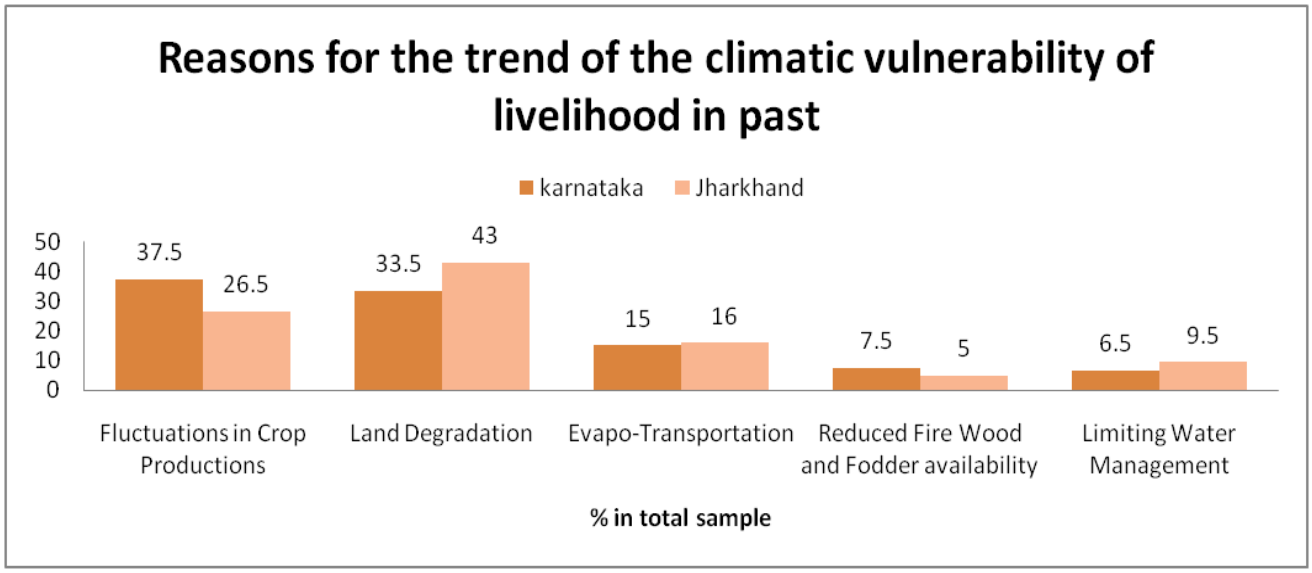


Figure 3.2.19: Reasons for the Trend of the Climatic Vulnerability of Livelihood in the Past

It opined by all the respondents of the study that over the years, means of several operations in their livelihood was replaced with other means of operations.

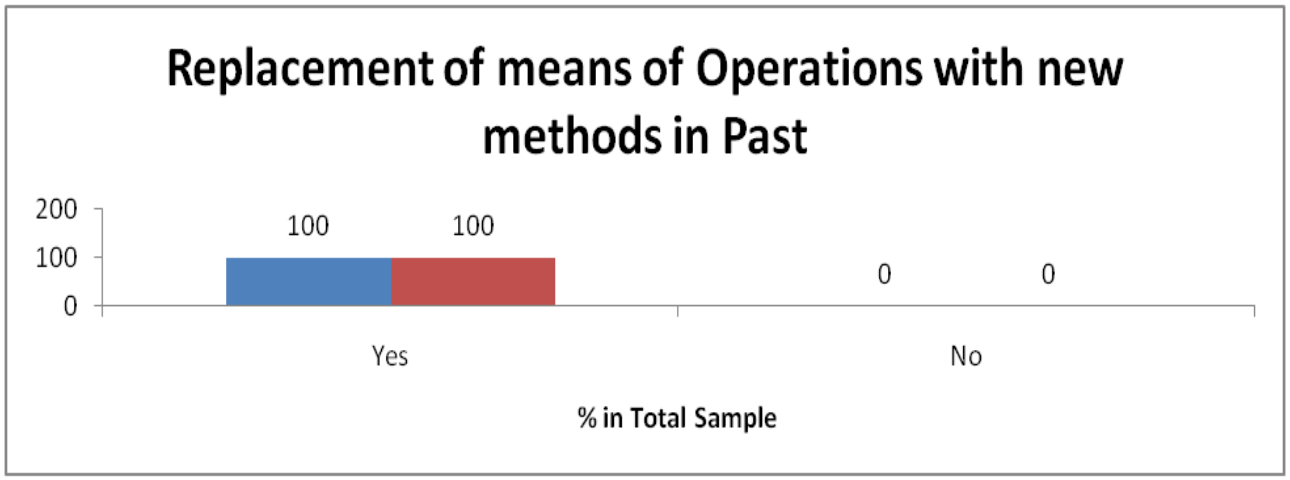


Figure 3.2.20: Replacement of Means of Operations with New Methods in the Past

It is observed that each respondent has replaced two or more means of core operations in their livelihood with other means. In Karnataka, 18% of the sample reported that they made replacements in six methods in the execution of their livelihood operations. Similarly, 20% of the sample made five replacements, 19% of the sample made four replacements, 29.5% of the sample made three replacements and 13.5% of the sample changed the means of two methods. Whereas in Jharkhand, 5.5% of the sample reported that they made changes in means of six methods in their livelihood operations, 20% of the sample changes five methods, 32.5% of the sample made changes in four methods, 29.5% of the sample made changes in three methods and 12.5% of the sample replaced the means of two livelihood operations.

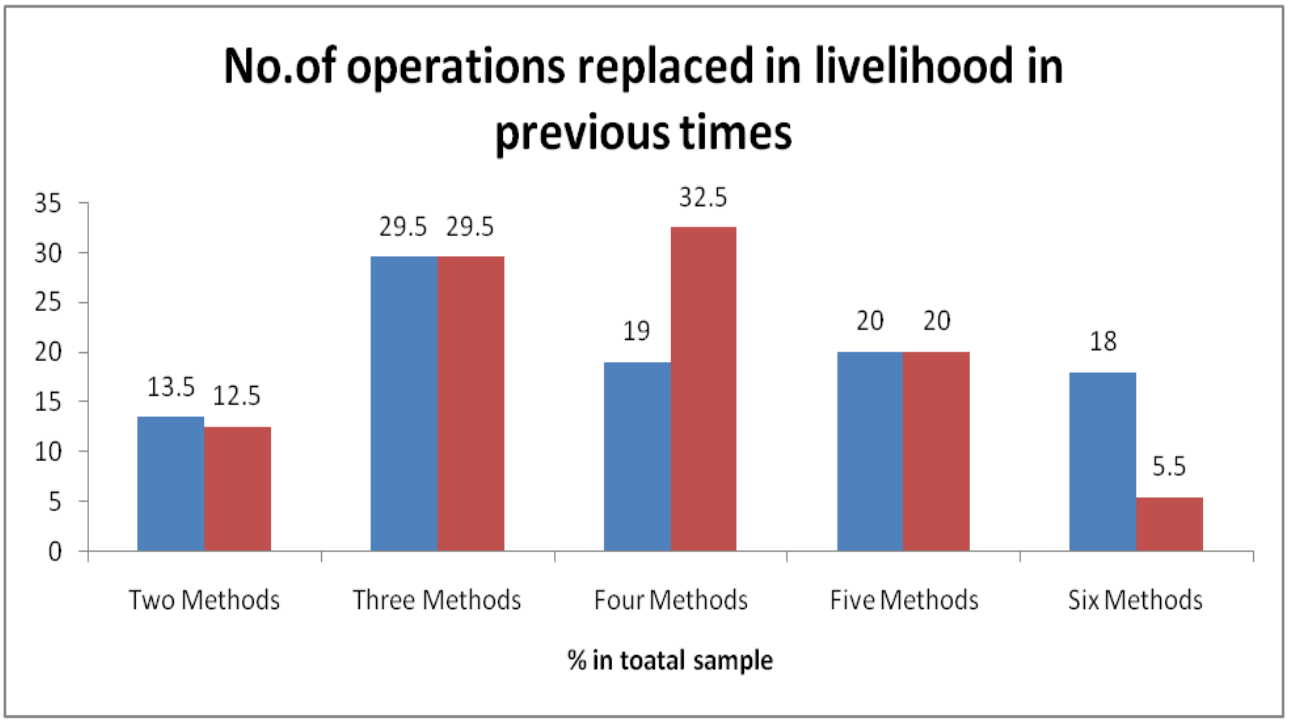


Figure 3.2.21: No. of Operations Replaced in Livelihood in Previous Times

Among the sample respondents, 60% in Karnataka and 47% in Jharkhand expressed that they have adopted both traditional and modern means for replacing the mean of their livelihood operations. On the other hand, 21% of the sample in Karnataka and 17% sample in Jharkhand reported that they adopted traditional means to replace the then prevailing means in their livelihood, whereas 19% in Karnataka and 36% in Jharkhand adopted modern means to replace their previous means of livelihood.

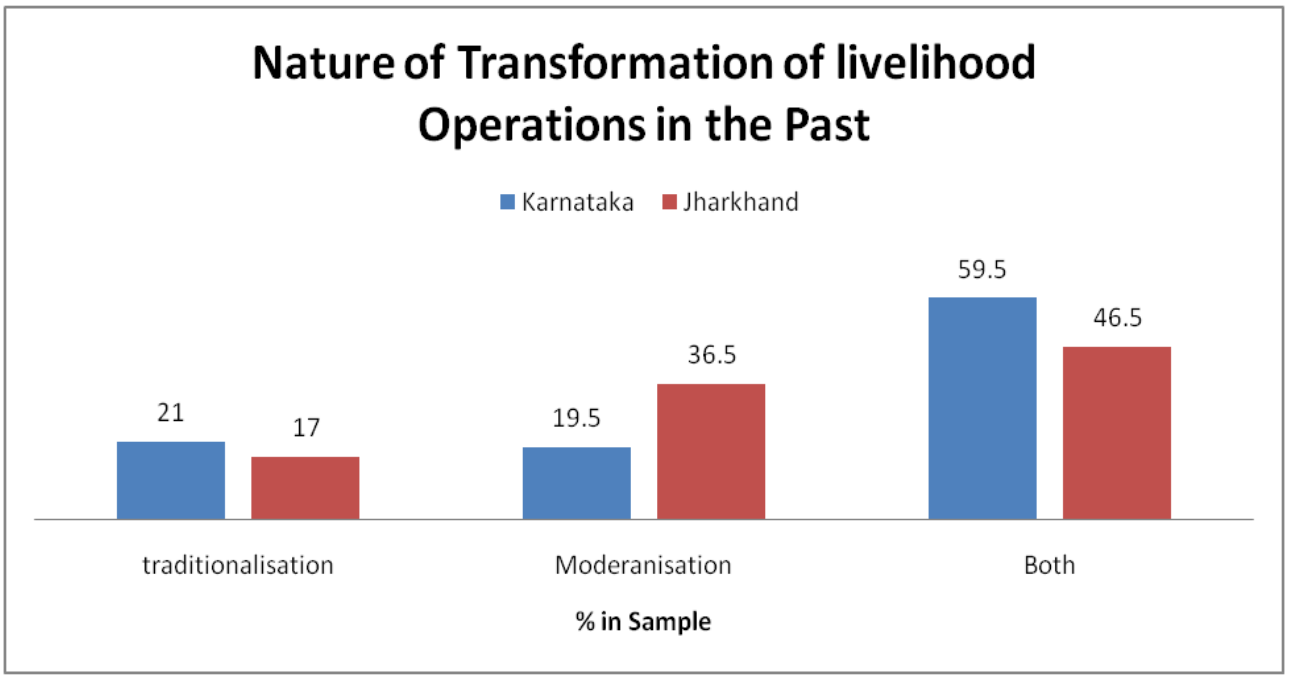


Figure 3.2.22: Nature of Transformation of Livelihood Operations in the Past

During the survey, all the respondents in both Karnataka and Jharkhand States expressed that their livelihood witnessed obsolescence due to the replacement of means in various operation of their livelihood.

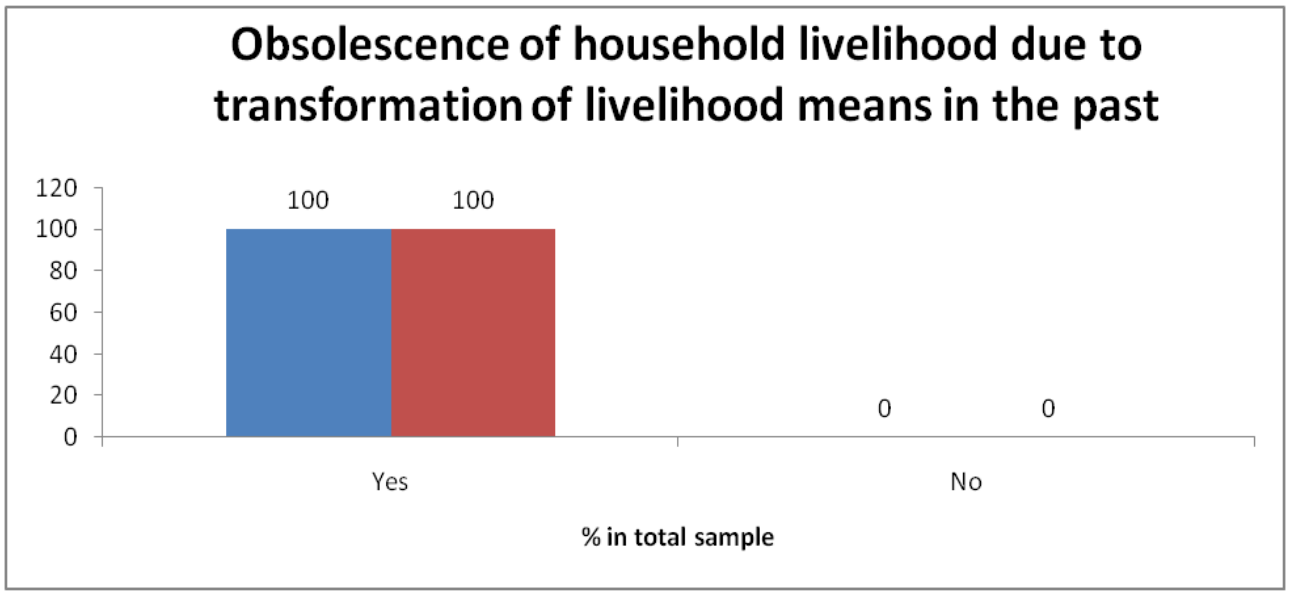


Figure 3.2.23: Obsolescence of Household Livelihood due to the Transformation of Livelihood Means in the Past

It is found that 31% of the sample in Jharkhand and 23.5% of the sample in Karnataka perceived the obsoleteness of their livelihood as very high and 18% of Karnataka sample and 35.5% of Jharkhand sample perceived their livelihood obsoleteness as high. Around 13% of the sample in both States perceived their livelihood obsoleteness as moderate level. On the other hand, 30% of the sample in Karnataka and 10% of the sample in Jharkhand perceived their livelihood obsoleteness as low and 15.5% of Karnataka sample and 10% of Jharkhand sample perceived it as very low.

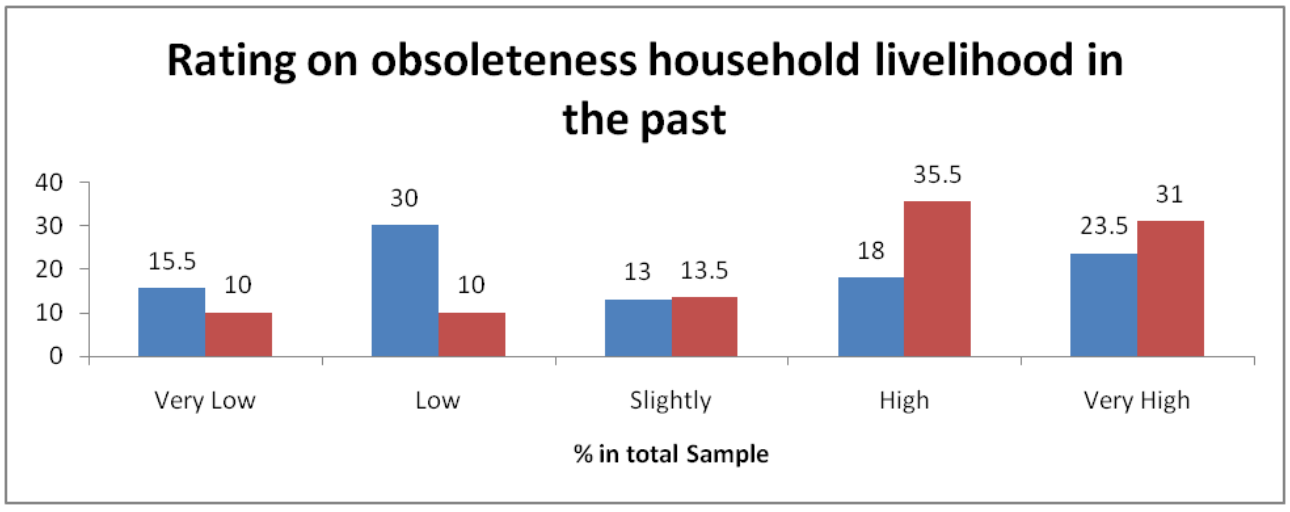


Figure 3.2.24: Rating Obsoleteness Household Livelihood in the Past

Over the years, it is observed that all the respondents of the study perceived that there has been an increasing trend in obsoleteness of their livelihood.

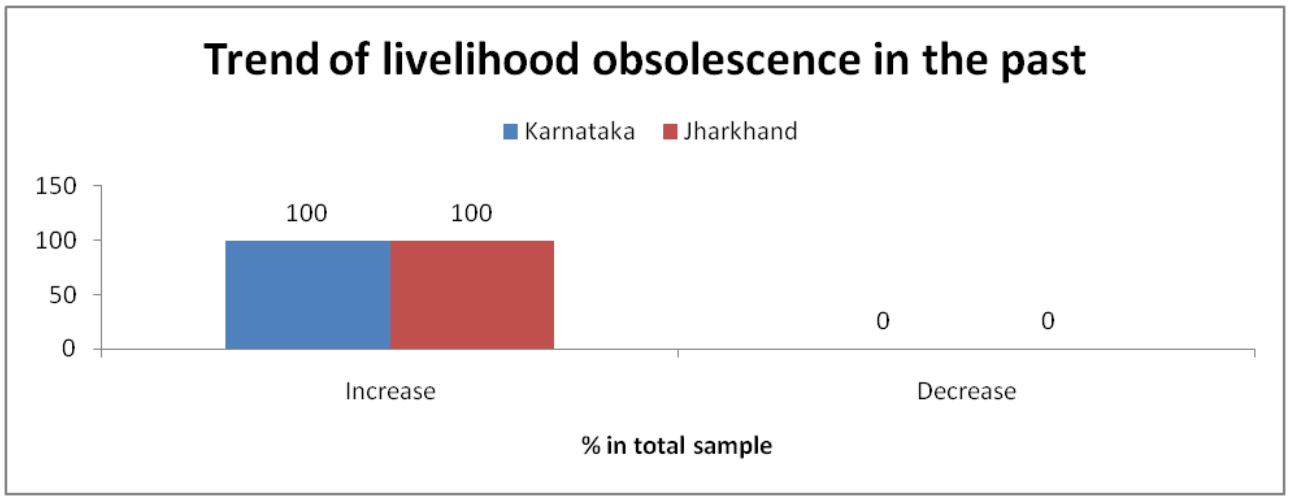


Figure 3.2.25: Trend of Livelihood Obsolescence in the Past

Various reasons were reported by the respondents for the increasing trend of livelihood obsoleteness. Majority of the sample (30%) in Karnataka and (35%) Jharkhand reported that lack of scientific knowledge to assess and monitor the means of transformation process led to their livelihood obsoleteness to increase further. 29% of the sample in Jharkhand and 15.5% in Karnataka believed that the depletion of resources causes the increase in livelihood obsoleteness in their livelihood. Similarly, 23.5% of sample population in Karnataka and 12.5% of Jharkhand perceived that lack of market information made their livelihood to prone to higher obsolescence level. The non-availability of inputs was also perceived as the cause for the increase in livelihood obsolescence by 13% sample population of Karnataka sample and 13.5% of Jharkhand.

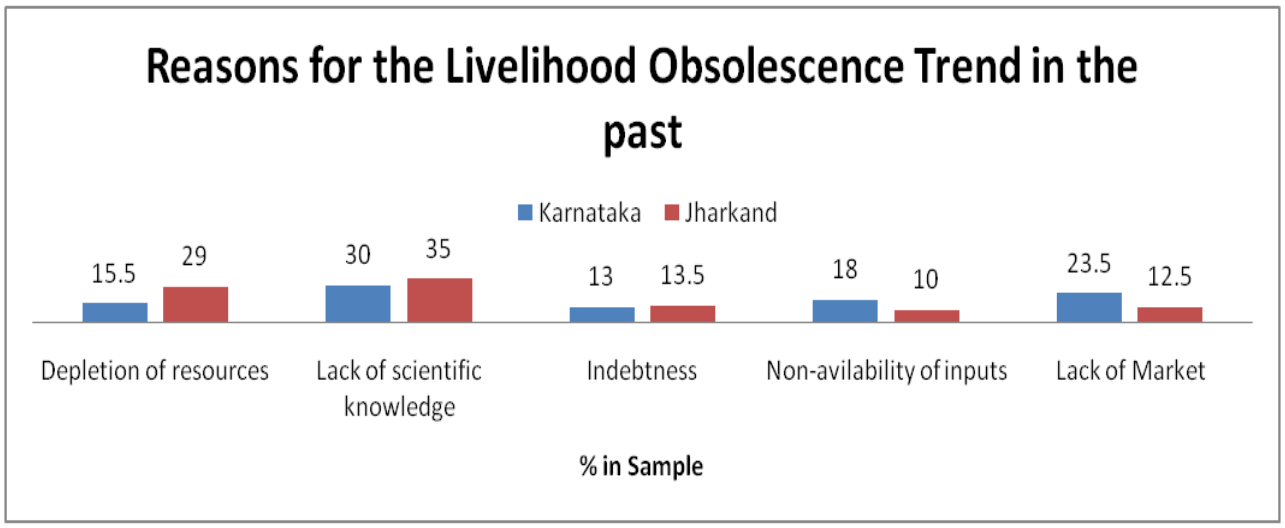


Figure 3.2.26: Reasons for the Livelihood Obsolescence Trend in the Past

During the survey, it is observed that all the respondents in both States perceived that their livelihood has been excluded by policymaker while designing development programmes.

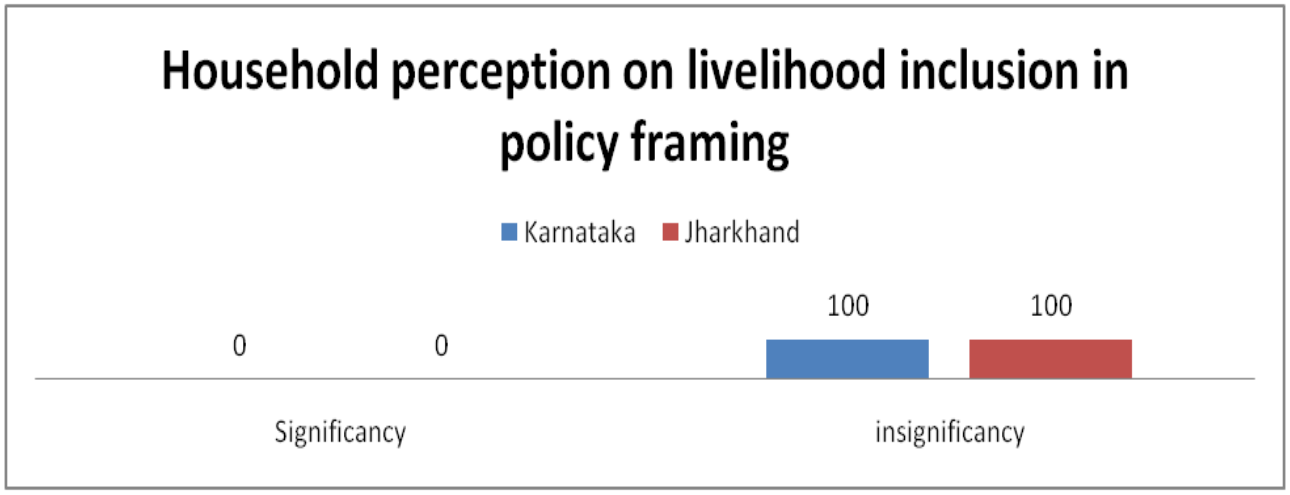


Figure 3.2.27 Household Perception on Livelihood Inclusion in Policy Framing

The access to various schemes that support their livelihood by an individual determines his/her views about their livelihoods inclusion in the developmental process. In Karnataka, majority of the respondents, i.e. 33% and 30% of the sample, perceived their access to livelihood supporting schemes as very low and low. Very few respondents, i.e. 14.5% of the sample, perceived their access to livelihood supporting schemes as very high.

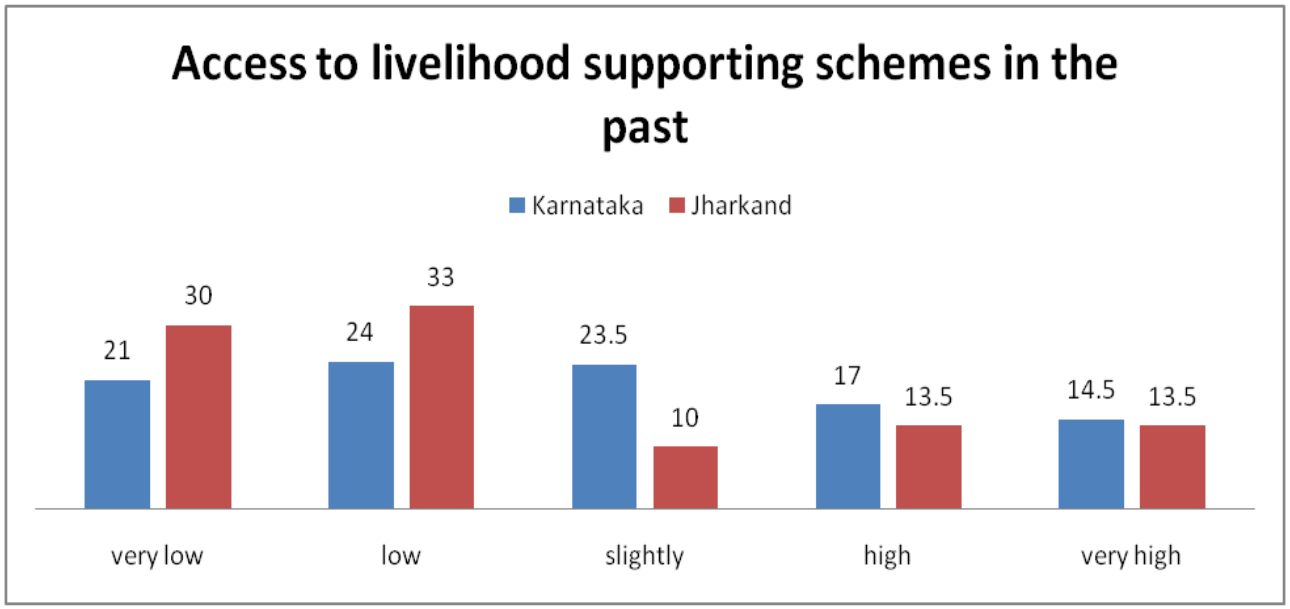


Figure 3.2.28: Access to Livelihood Supporting Schemes in the Past

It is observed that all the respondents of the study perceived that there has been a decline in the number of schemes deployed to strengthen the livelihood.

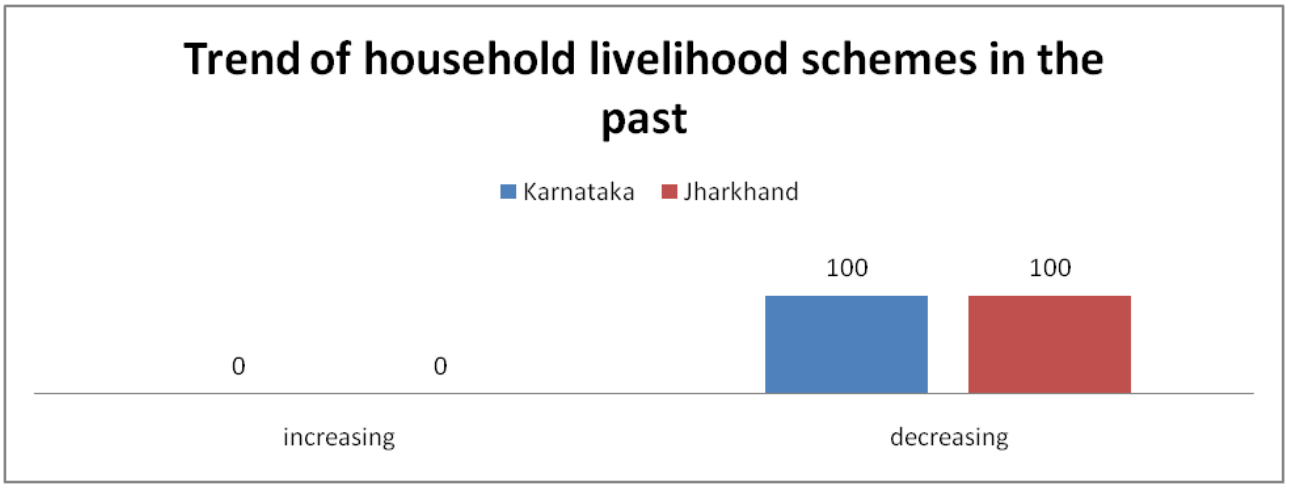


Figure 3.2.29: Trend of household Livelihood Schemes in the Past

Respondents believed that various reasons contributed to the decreasing trend in framing various schemes related to their livelihood. In Karnataka, 17% of the sample perceived livelihood diversification; 15.5% of the sample considered lack of partnership between individual and institutions; 16.5% perceived lack of access to financial services; 13% perceived lack of strengthening of social capital; 11% sample perceived lack of digital information dissemination; 10% of the sample perceived lacking timely backward and forward linkages; 9% of the sample perceived lack of exposure to value addition and 8% sample perceived lack of facilitation services as the reason for the declining trend. In Jharkhand, majority of the sample, i.e. 18.5% sample perceived lack of strengthening of social capital as the cause for declining trend and On the other hand, only 6% of the sample perceived lack of facilitation services and lack of exposure to value addition as the major reasons behind the declining trend.

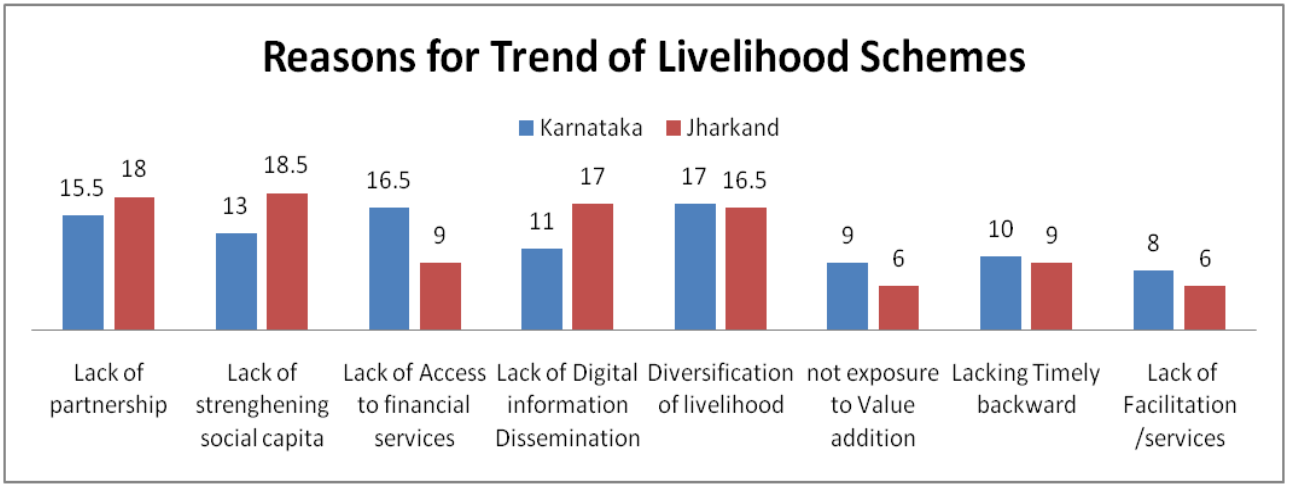


Figure 3.2.30: Reasons for Trend of Livelihood Schemes

During the survey, 37.5% of sample respondents in Jharkhand and 35.5% in Karnataka rated relative importance of livelihood in policymaking as low while 27.5% and 24.5% of the sample, respectively, rated it as very low. On the other hand, 9.5% sample in both States rated their relative importance of livelihood in policymaking as high while 10.5% sample in Karnataka and 8% in Jharkhand rated it as very high.

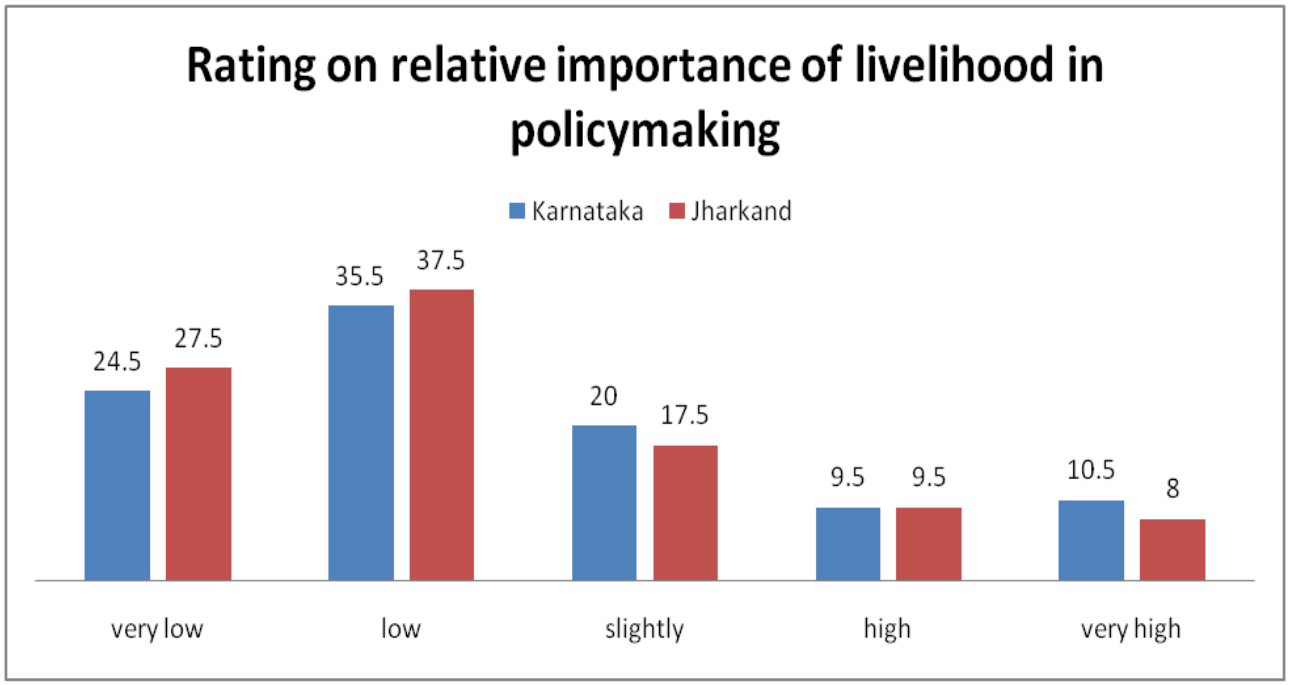


Figure 3.2.31: Rating on the Relative Importance of Livelihood in Policymaking

During the survey, all the respondents of both States expressed that they have made exposure visits to various places to learn and improve their livelihood operations.

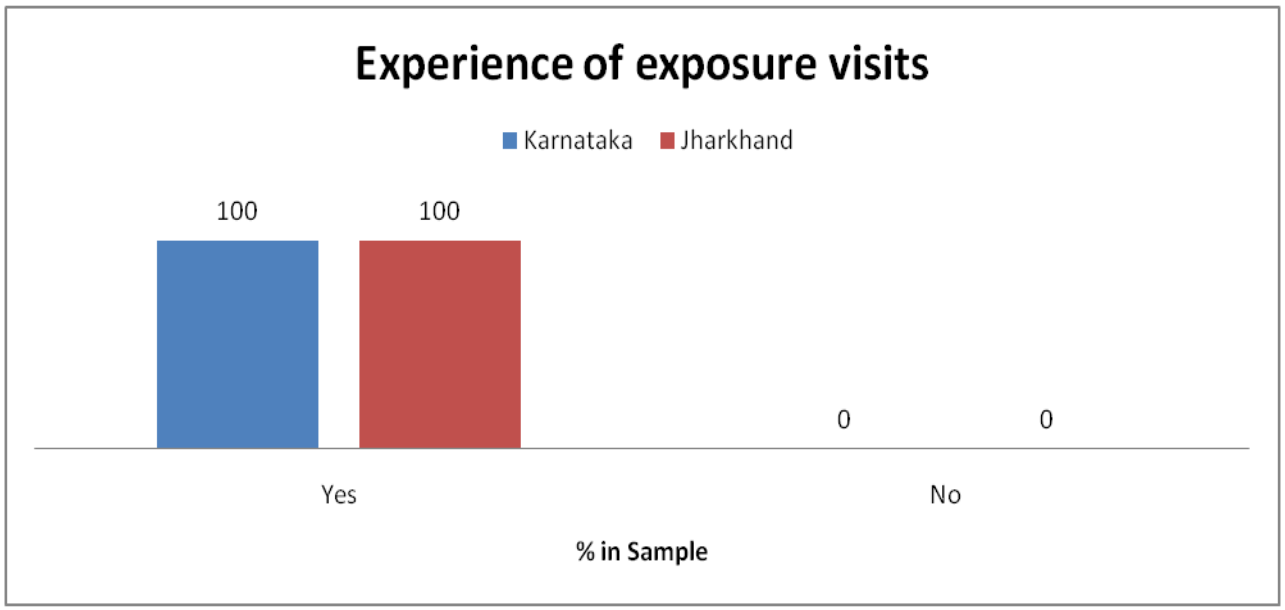


Figure 3.2.32: Experience of Exposure Visits

It is observed that in Karnataka, 41% of the sample made their exposure visits during the month of May and 38% of the sample visited other places during the month of April and 21% reported that they have made exposure visits during the month of March. In Jharkhand, 36% of the sample visited other places during the month of December and 32.5% of the sample attended exposure visits that were planned during the month of January and 31.5% sample made exposure visits in the month of November.

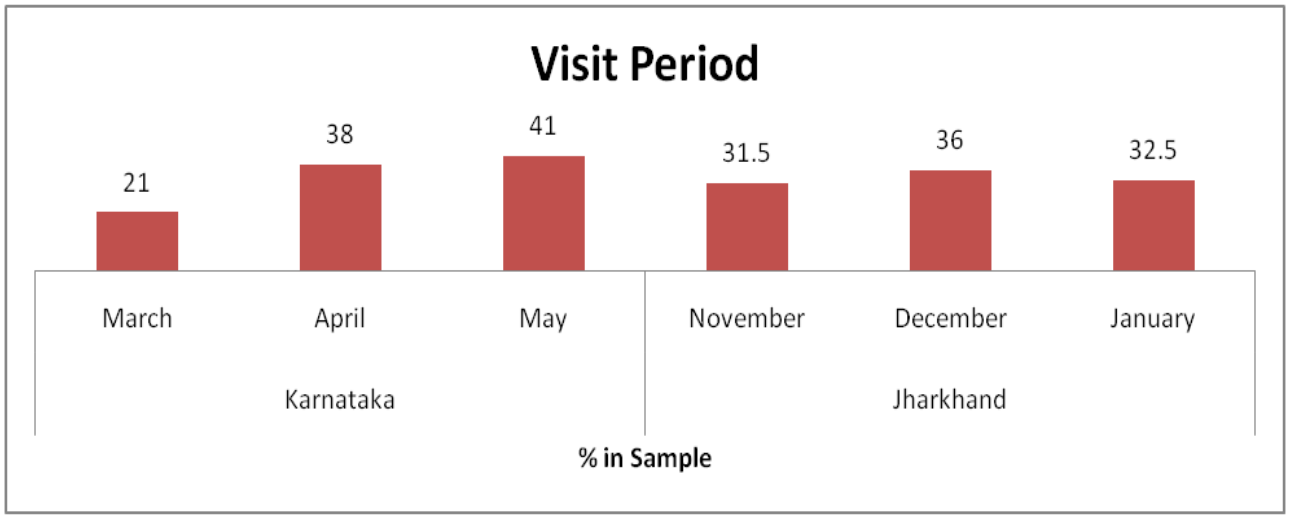


Figure 3.2.33: Visit Period

Among various aspects of exposure visits, 93% of the Karnataka sample and 90% of the Jharkhand sample exposed to the activities of Farmers Field School; 96% of the Karnataka sample and 85% of the Jharkhand sample exposed to the field practices followed by progressive farmers in their regions; 58% of Karnataka farmers and 75% of Jharkhand farmers exposed to organic agricultural practices and 59.5% of Karnataka farmers and 80% of Jharkhand farmers exposed to the lessons of Demonstration Platforms.

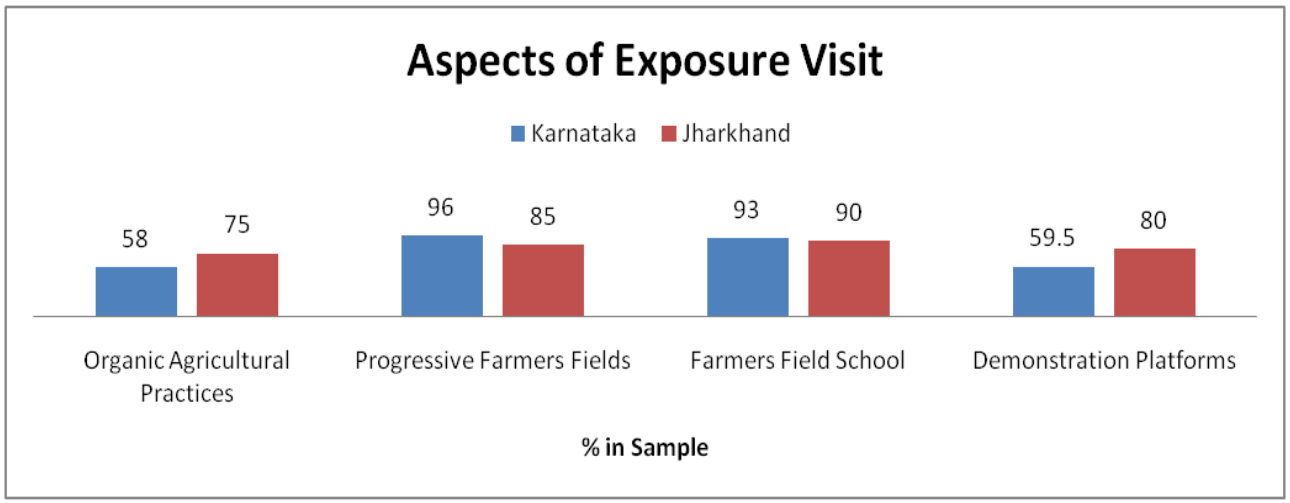


Figure 3.2.34: Aspects of Exposure Visits

It is observed that majority of the sample respondents, i.e. 65% of Karnataka sample and 78.5% of Jharkhand sample participated in three exposure visits and 14.5% of Karnataka sample and 7% of Jharkhand sample made two exposure visits and 20.5% of Karnataka sample and 14.5% of Jharkhand sample participated in at least four exposure visits in their lifetime.

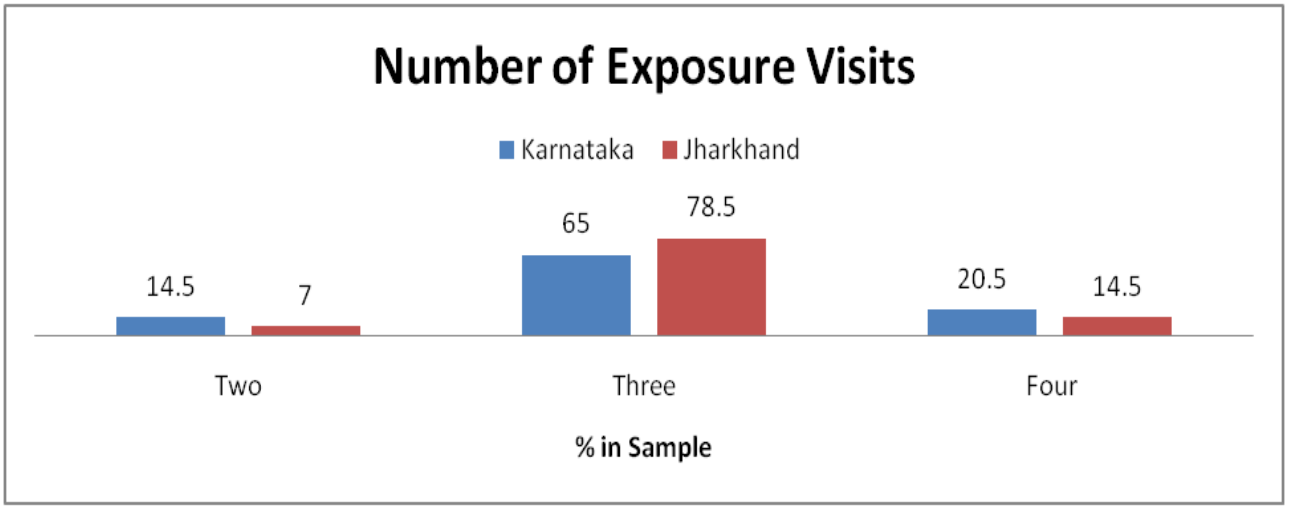


Figure 3.2.35: Number of Exposure Visits

The duration of exposure visits of the sample respondents is greatly varied across the States. It is found that 92.5% of Jharkhand sample respondents spent nearly nine and more days for exposure visits and 5% of the sample spent 6-8 days for exposure visits and only 2.5% of the sample spent 1-5 days for the exposure visits. In Karnataka, 68.5% of the sample spent 6-8 days for exposure visits and 21% of the sample spent more than eight days for exposure visits and only 10.5% of the sample spent 1-5 days on exposure visits.

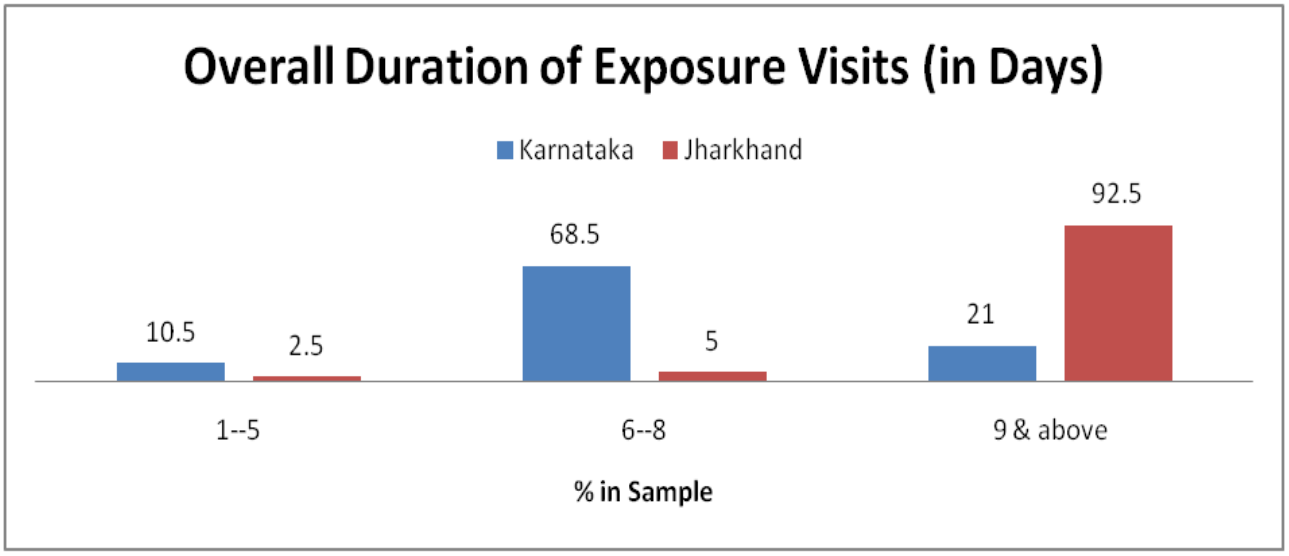


Figure 3.2.36: Overall Duration of Exposure Visits (in Days)

Sample respondents of the study reported that the exposure visits were facilitated by the local NGOs and government agencies. It is observed that 100% of sample respondents in Karnataka claimed the partnership between government and NGOs as a facilitating factor of exposure visits. In Jharkhand, 80% of them believed that the exposure visits were facilitated through the partnership between government and the local NGOs and 13.5% of the sample felt that the government is the only facilitating agency for their exposure visits while 6% considered their local NGOs as the facilitating agencies for the exposure visits.

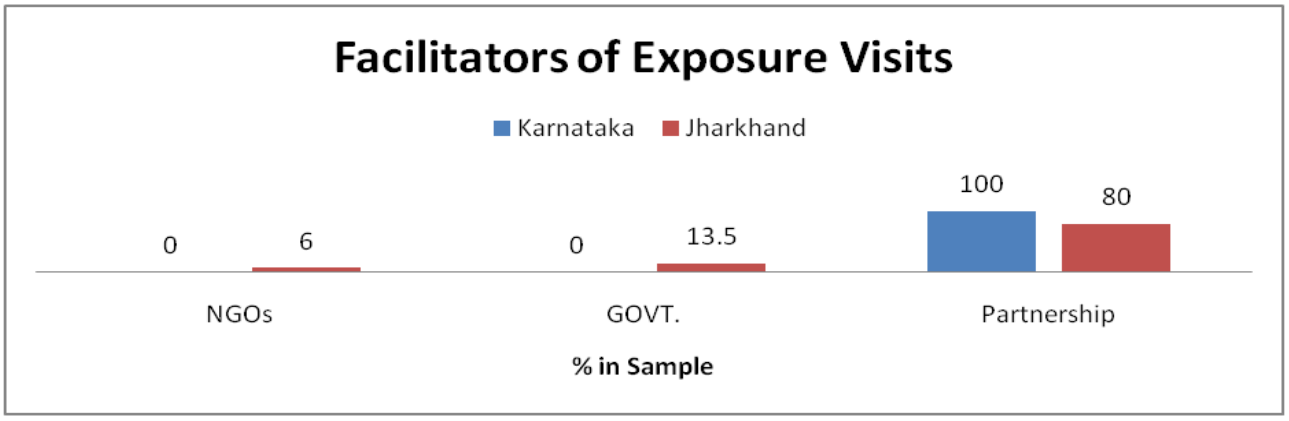


Figure 3.2.37: Facilitators of Exposure Visits

The utility of the exposure visits was varyingly perceived by the respondents of Karnataka and Jharkhand regions. It is found that 60.5% of the Jharkhand sample and 50.5% of the Karnataka sample perceived the utility of their exposure visits as very high; 35% of Karnataka sample and 5% of the Jharkhand sample perceived the utility of the exposure visits as high; 10.5% of the Jharkhand sample and 8% of the Karnataka sample moderately perceived their exposure visits; 13% of Jharkhand and 3.5% of Karnataka sample perceived their exposure visits' utility as less and 3% of Karnataka sample and 11% of Jharkhand sample perceived their exposure visits with very less utility in improving their livelihood.

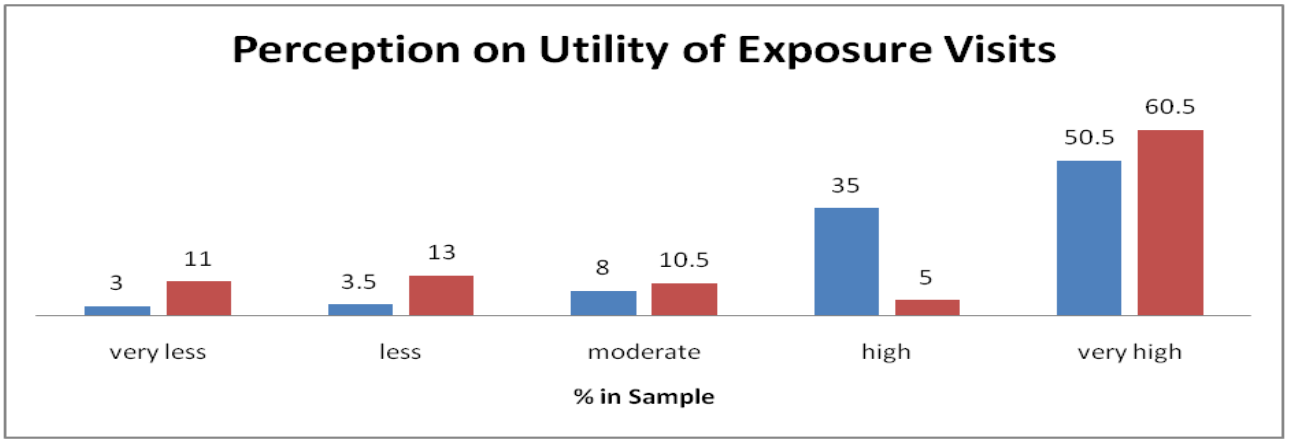


Figure 3.2.38 Perception on Utility of Exposure Visits

All the participants of the study opined that their knowledge over various livelihood supporting institutions has been increased over the period.

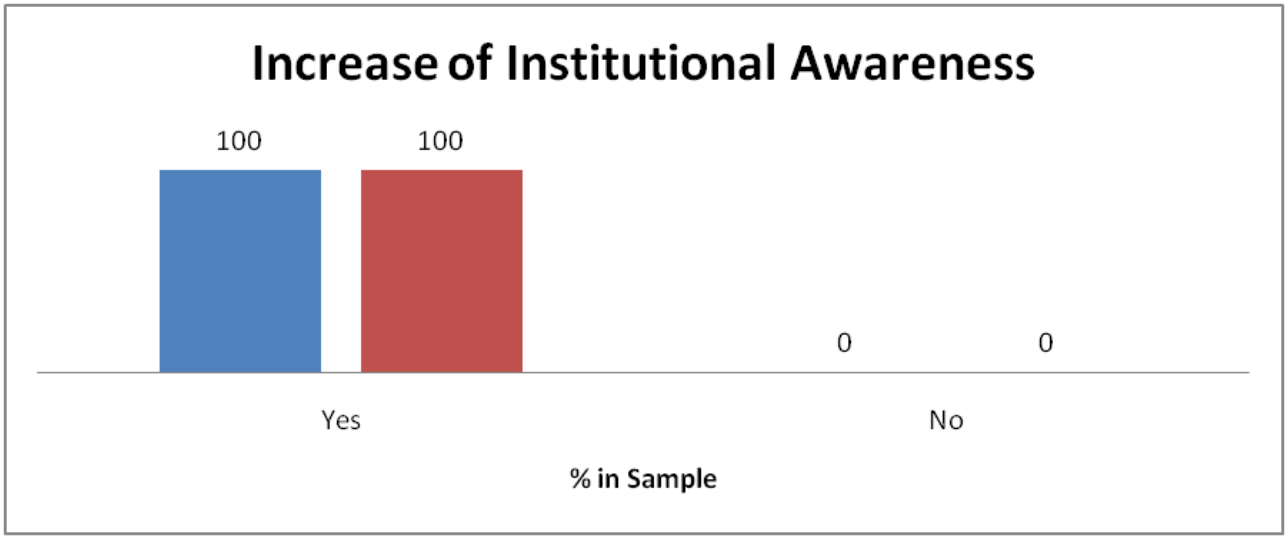


Figure 3.2.39: Increase of Institutional Awareness

Individuals' knowledge of institutions was increased either through self-efforts or through external support by NGOs, government, private agencies, etc. During the survey, it is observed that 80% of the Karnataka sample and 64.5% of Jharkhand sample believed that their knowledge of institutions was improved majorly due to the support rendered by the external agencies. On the other hand, 20% Karnataka sample and 28% of Jharkhand sample believed that they have increased their awareness of institution with the help of their self-efforts as well as external support. Only 7.5% of Jharkhand sample perceived that their institutional awareness has been increased through self-efforts.

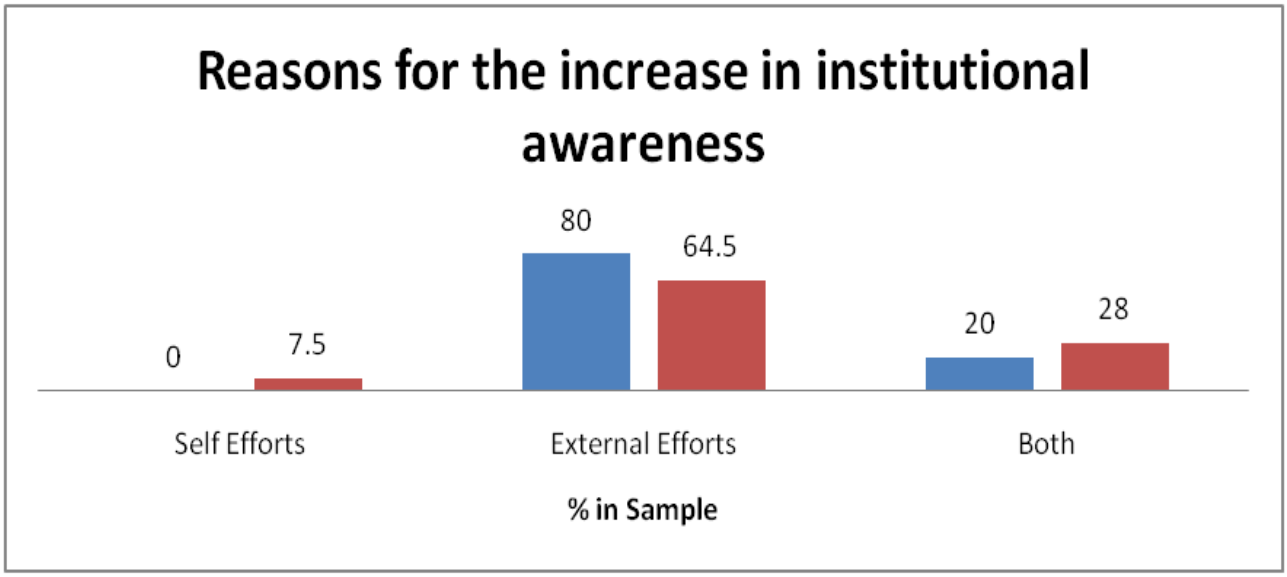


Figure 3.2.40: Reasons for the Increase in Institutional Awareness

It is observed that in Karnataka, 62% of the sample secured external assistance from NGOs to improve their awareness of institutions and 27% of the sample secured assistance from government agencies and 11% of the sample secured external assistance from the partnership of government and NGOs. In Jharkhand, 83.5% of the sample supported by the government and NGOs partnership in improving their institutional awareness and 13.5% of the sample secured such assistance by government and 3% of the sample received assistance from only NGOs.

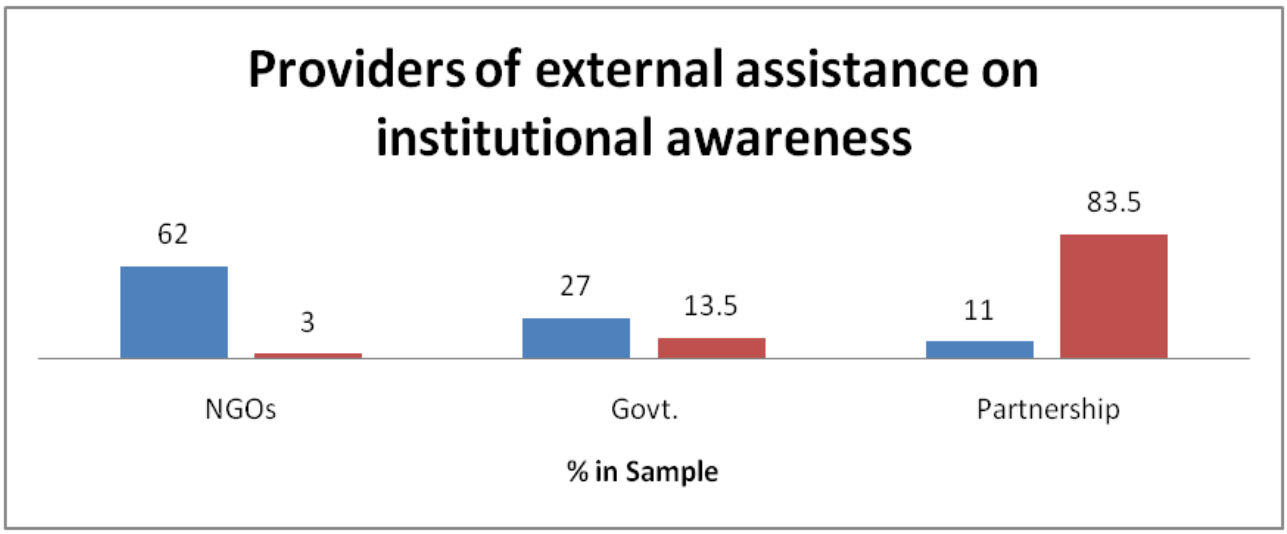


Figure 3.2.41: Providers of External Assistance on Institutional Awareness

All the respondents of the study noted that the external agencies have followed various methods to improve their institutional awareness. The major methods followed by external agencies include Participatory Rural Appraisal Method, Focus Group Discussion Method and Networking method.

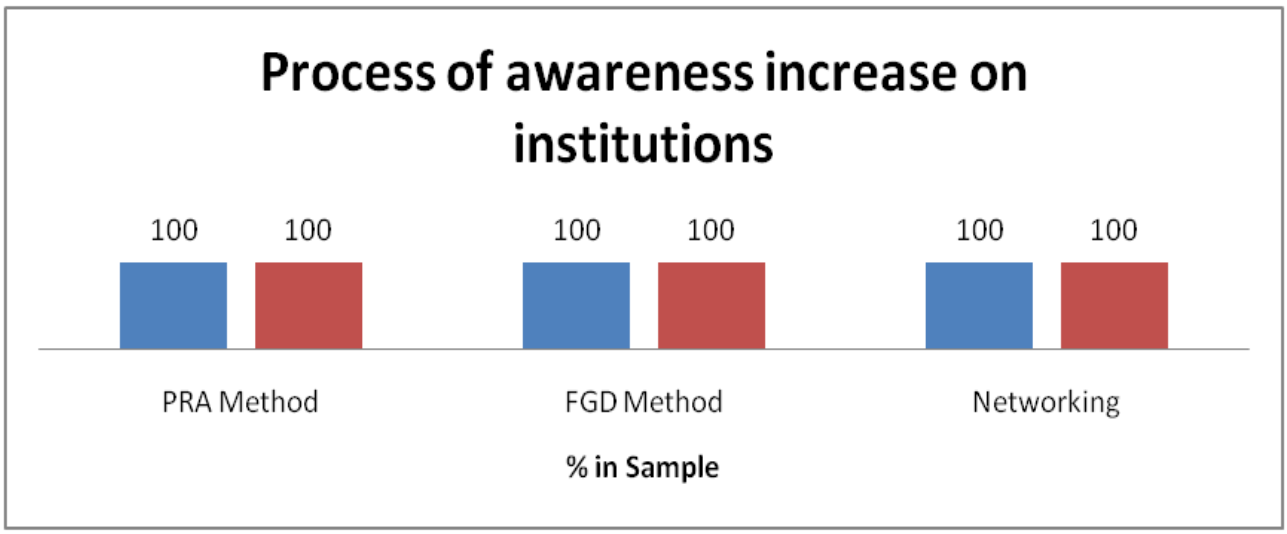


Figure 3.2.42: Process of Awareness Increase on Institutions

The study respondents reported that they could succeed in establishing a network with various institutions to improve their livelihood with the help of their enhanced institutional awareness. It is observed that in Karnataka, various proportions of the sample, viz. 100%, 86%, 84%, 96.5%, 87% and 8.5% have made network with SHGs, NGOs, KVKs, Banks, government and village organisations, respectively. In Jharkhand, a proportion of 85%, 78%, 80%, 95%, 84% and 15% sample respondents made network, respectively, with SHGs, NGOs, KVKs, Banks, government and village organisations.

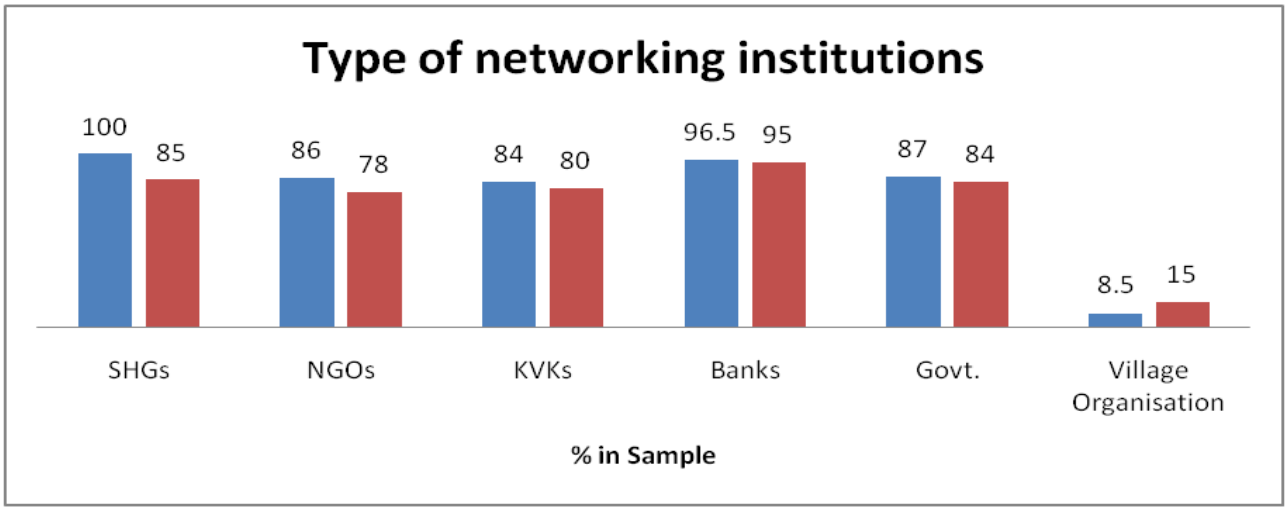


Figure 3.2.43: Type of Networking Institutions

It is observed that there is a quite variation in the networking ability of the sample respondents in both States. Majority of the sample respondents, i.e. 58.5% of the Jharkhand and 56.5% of the sample in Karnataka, have a network with five institutions and 37.5% of Karnataka sample and 34.5% of Jharkhand sample established network with four institutions. Also, 4% and 2% of Karnataka sample and 5.5% and 1.5% of Jharkhand sample respondents made network with six and three institutions, respectively.

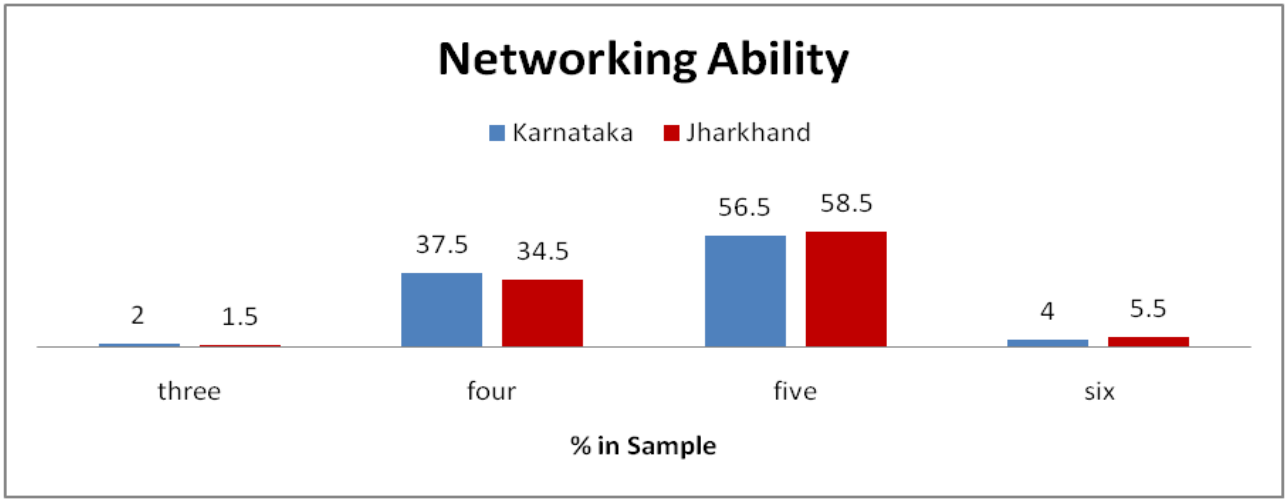


Figure 3.2.44: Networking Ability

It is found that 96% of Karnataka sample and 85% of Jharkhand sample respondents expressed that network with institutions is financial in nature and 94.5% of Karnataka and 91% of Jharkhand respondents reported that their network with institutions is also has marketing.

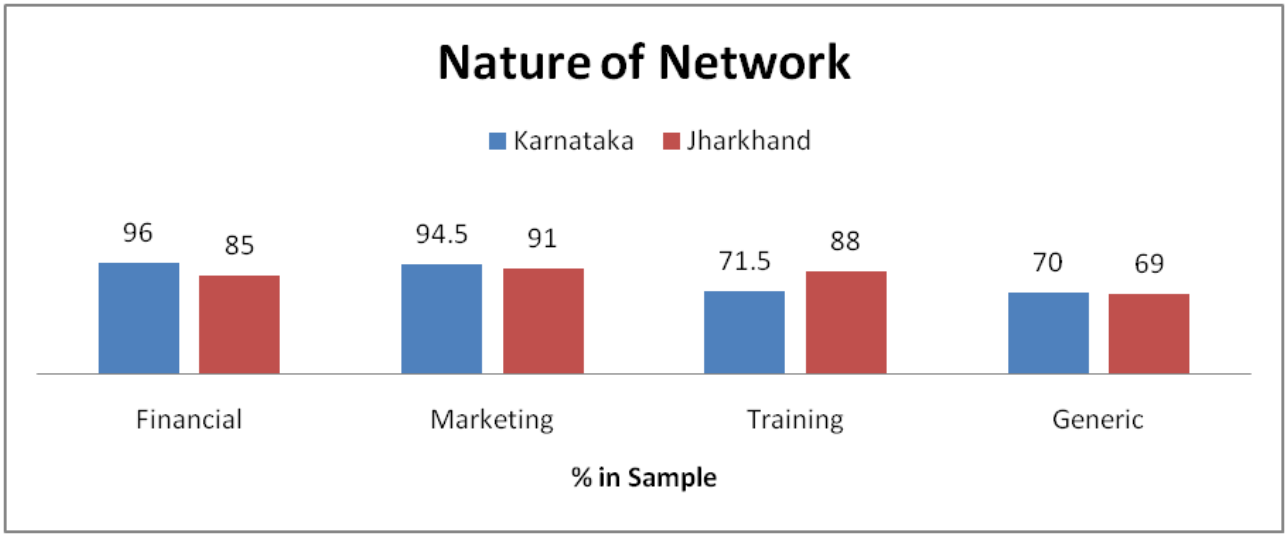


Figure 3.2.45: Nature of Network

The usefulness of the institutional awareness for the strengthening of individual livelihood is being varyingly perceived by the respondents of the study. It is found that 39% of the Karnataka sample and 41% of the Jharkhand sample perceived it as very highly useful and 16.5% of Karnataka sample and 29.5% of the Jharkhand sample perceived it as highly useful. Whereas 5% of Karnataka sample and 2% of Jharkhand sample perceived it as very less useful and 7% of Karnataka and 15.5% of Jharkhand sample found it less useful. On the other hand, 2.5% of the Karnataka sample and 12% of Jharkhand sample perceived the utility of institutional awareness as moderately useful for improvement of their livelihood.

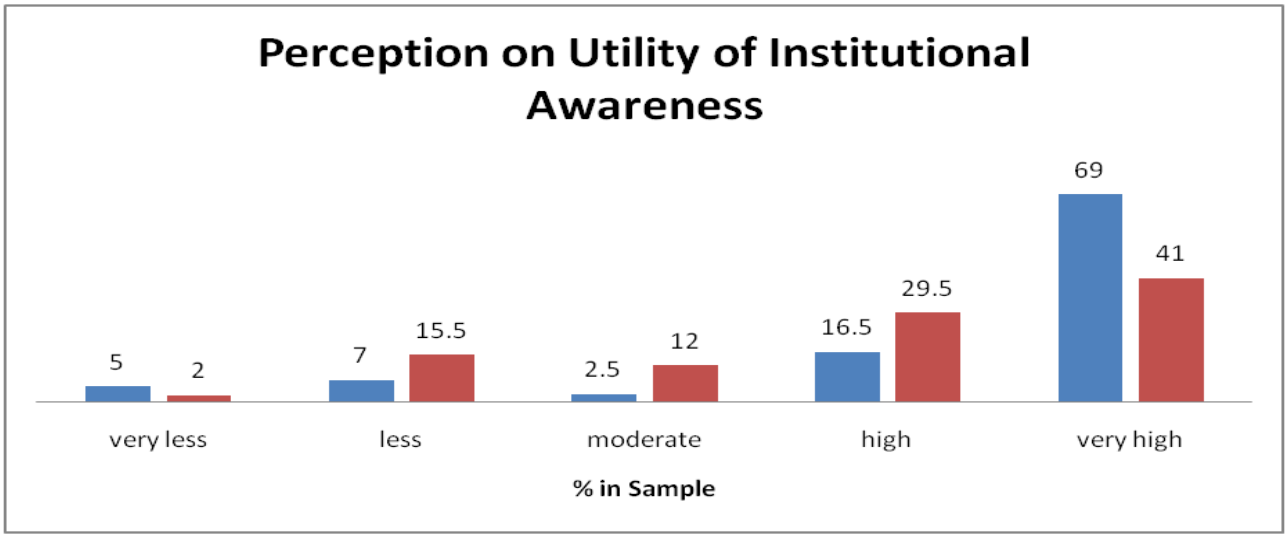


Figure 3.2.46: Perception on Utility of Institutional Awareness

All the respondents of the study reported that their skills and abilities required for accomplishing various tasks in their livelihood have been improved over the period.

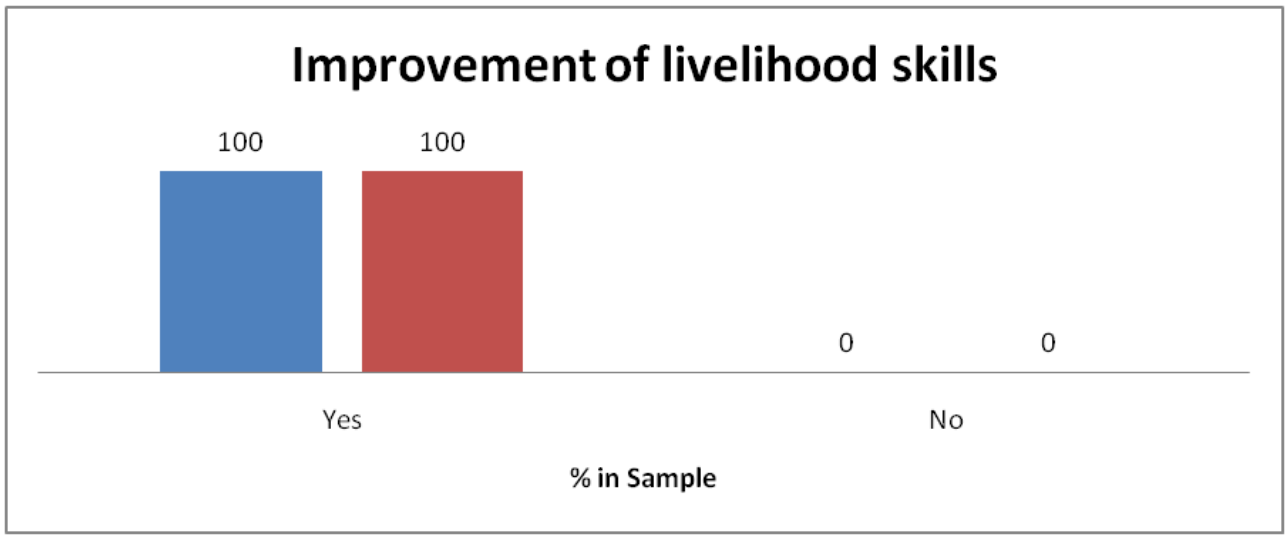


Figure 3.2.47: Improvement of Livelihood Skills

The skill of the profile of an individual would strengthen due to their self-efforts or with the assistance from external sources. It is found that 100% of Karnataka sample believed their skill profile was improved due to the assistance provided by the external agencies. Whereas the 87.5% and 12.5% of the sample of Jharkhand district believed that their skill profile was increased due to external assistance and through their self-efforts, respectively.

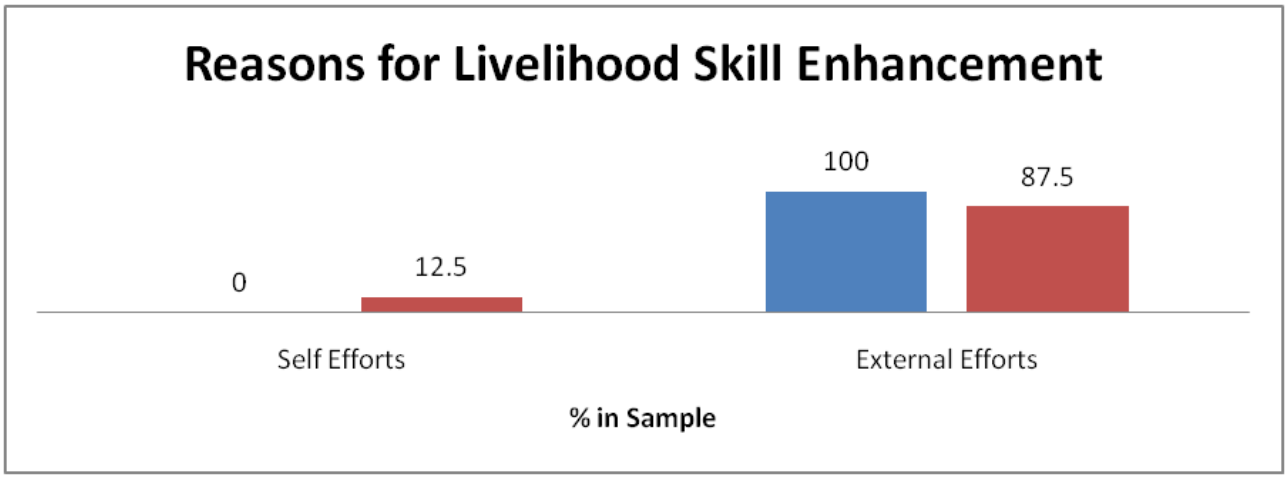


Figure 3.2.48: Reasons for Livelihood Skill Enhancement

Among the various agencies that provide assistance to improve individuals' skills and capacities required for discharging livelihood activities, 83% of Karnataka sample and 12.5% of Jharkhand sample were assisted by only NGOs. On the other hand, 14% of Karnataka sample and 23.5% of Jharkhand sample secured such assistance by only government agencies, whereas 64% of Jharkhand sample and 3% of Karnataka sample were assisted by both NGOs and government agencies.

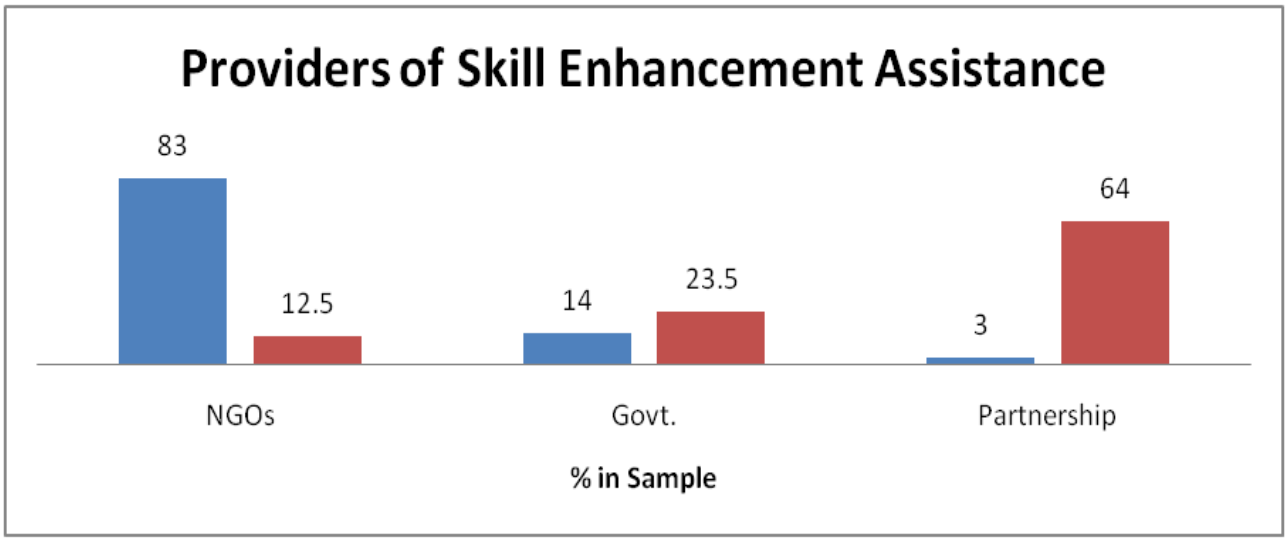


Figure 3.2.49: Providers of Skill Enhancement Assistance

The skill profile of the sample respondents was increased majorly through two methods such as training and knowledge dissemination through ICT applications. It is observed that 68.5% of Jharkhand sample and 58.5% of Karnataka sample improved their skill profile by utilising training and ICT methods. Similarly, 17% of Karnataka sample and 27% of Jharkhand sample utilised only ICT methods for their skills improvement, whereas 24.5% of Karnataka sample and 4.5% of Jharkhand sample respondents' skills were improved through training.

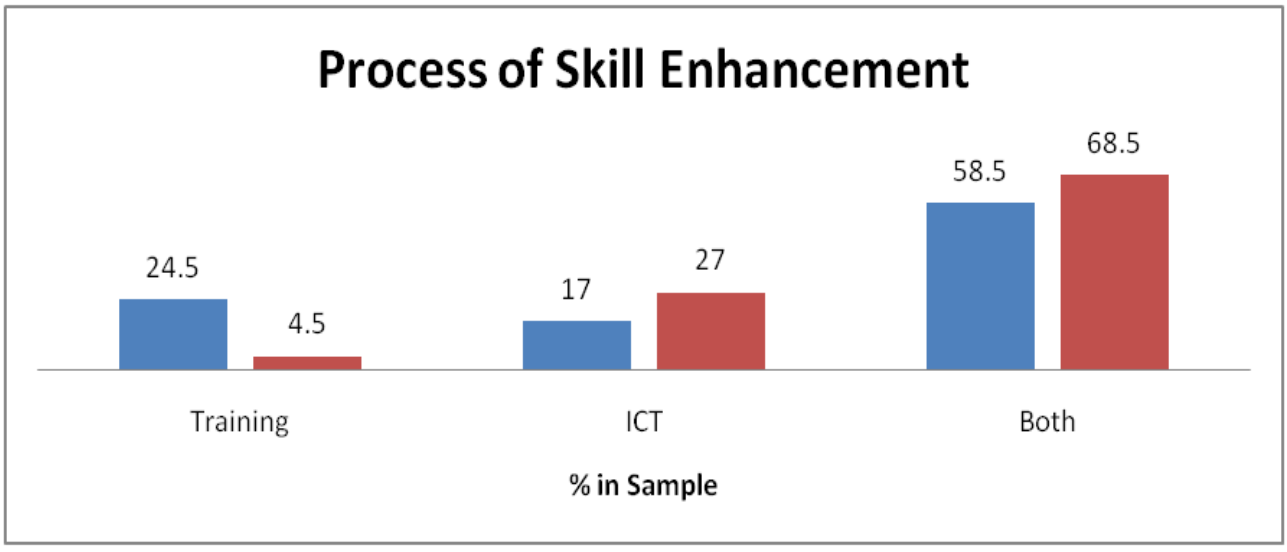


Figure 3.2.50: Process of Skill Enhancement

It is observed that in Karnataka, 45.5%, 36% and 18.5% of sample respondents undergone training during the months of May, April and March, respectively. In Jharkhand, 35% of respondents went to training during January and another 35% of respondents took it during December, but 30% of the sample respondents went for training during November.

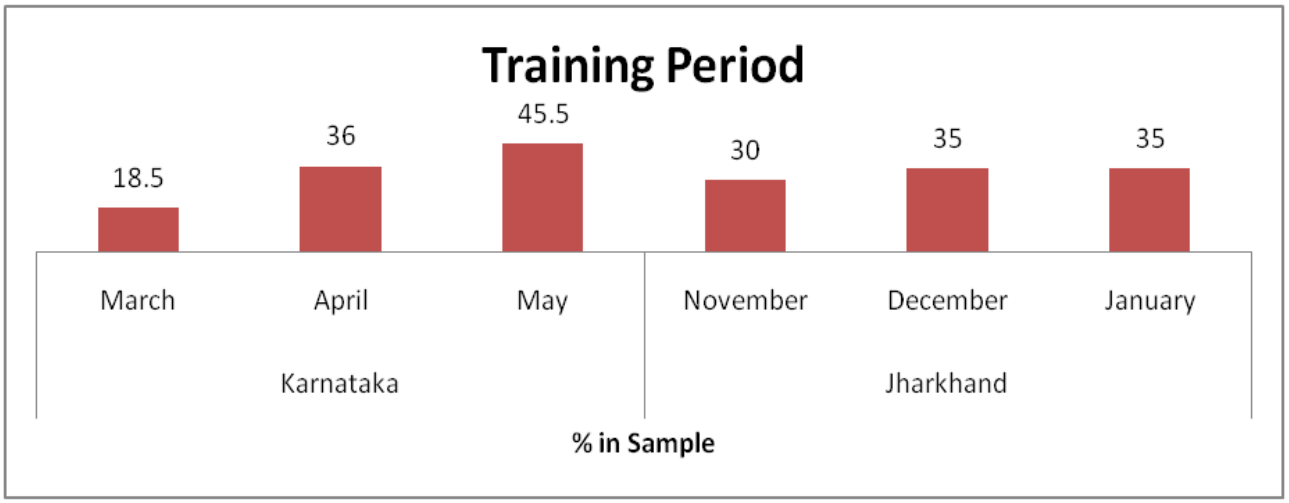


Figure 3.2.51: Training Period

Training regarding various aspects of livelihoods was given to the respondents of the study. It is found that 90.5% of Karnataka respondents and 88% of the Jharkhand respondents trained on technology usage in various activities related to their livelihood. Another 71.5% of Karnataka sample and 75% of Jharkhand sample were given training on marketing aspects related to their produces. A similar proportion of 72% of Karnataka sample and 66% of Jharkhand sample took training on animal rearing. A sample of 64.5% in Karnataka and 62% in Jharkhand got training on vegetable cultivation. It also noted that 74% of Karnataka sample and 69% of Jharkhand sample trained on various methods of FYM preparations. The training on seed treatment was taken by 82% of Karnataka sample and 77% of Jharkhand sample respondents. Similarly, 68.5% of Karnataka sample and 67% of Jharkhand sample has undergone training on organic agricultural practices.

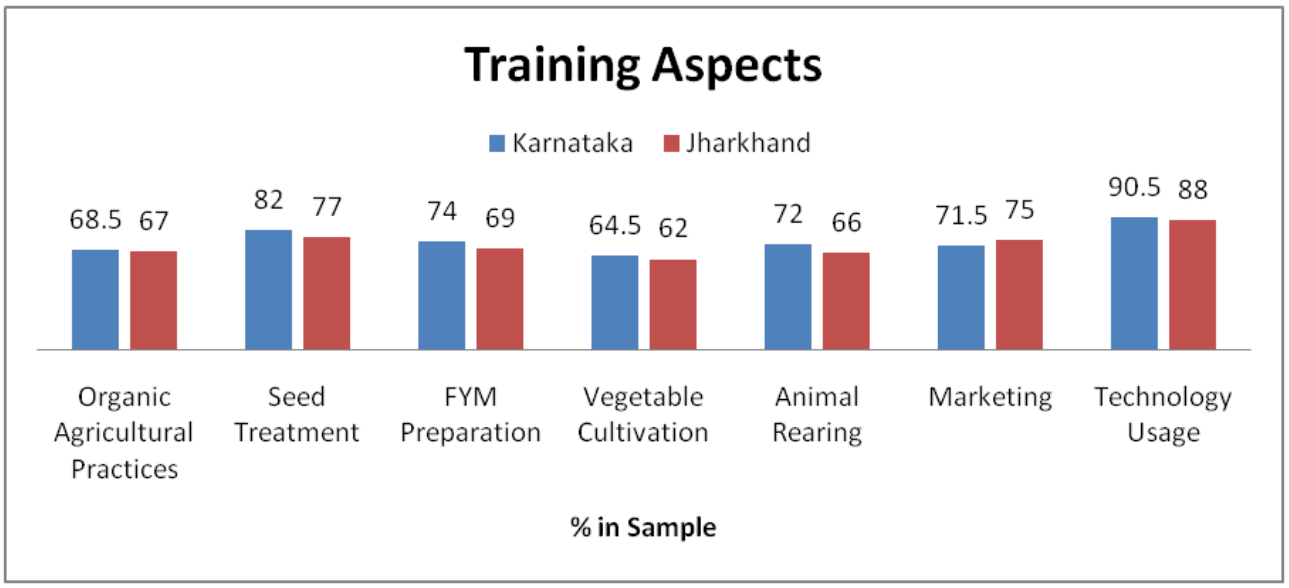


Figure 3.2.52: Training Aspects

It is found that 65% of Jharkhand respondents and 33.5% of Karnataka sample have undergone training for 17-22 days and 33% of Karnataka and 20% of Jharkhand respondents have trained for 23-28 days and 19.5% of Karnataka sample and 6% of Jharkhand sample trained for more than 29 days and 14% of Karnataka sample and 3% of Jharkhand sample took training for 11-16 days.

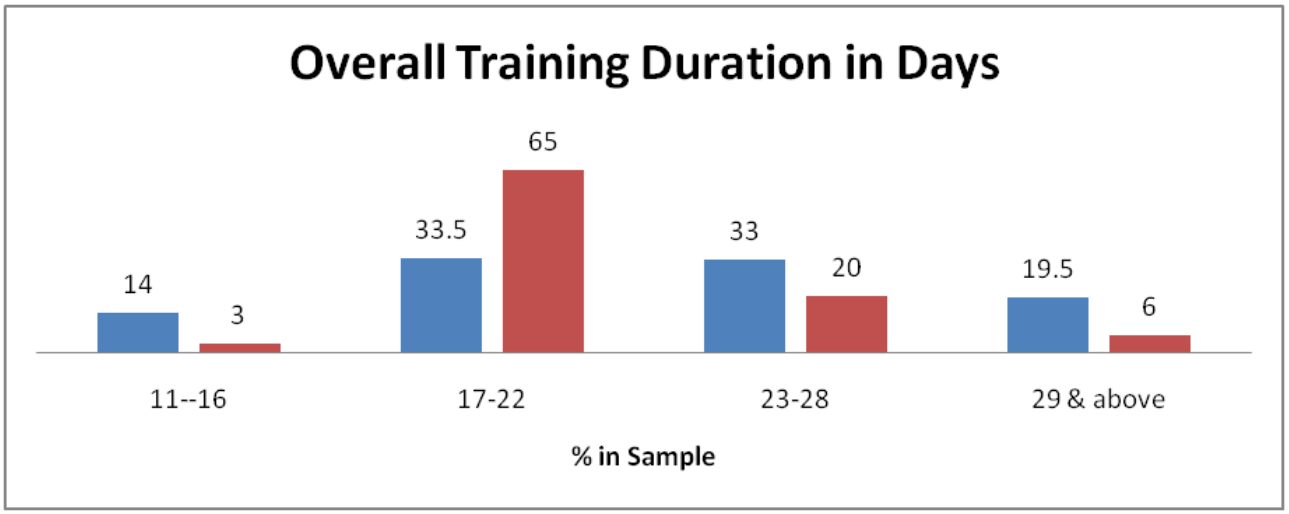


Figure 3.2.53: Overall Training Duration in Days

Among the sample respondents in the study, 58.5% of Karnataka sample and 47.5% of Jharkhand respondents perceived the utility of training as very high. Similarly, 28% of Karnataka sample and 35% of Jharkhand sample expressed that the training they have taken has a high utility. An 8.5% of Karnataka and 10% of Jharkhand sample perceived moderate utility regarding their training. Whereas 3% of Karnataka sample and 5.5% of Jharkhand sample perceived the training with less utility and the remaining 2% sample in each perceived their training with very less utility.

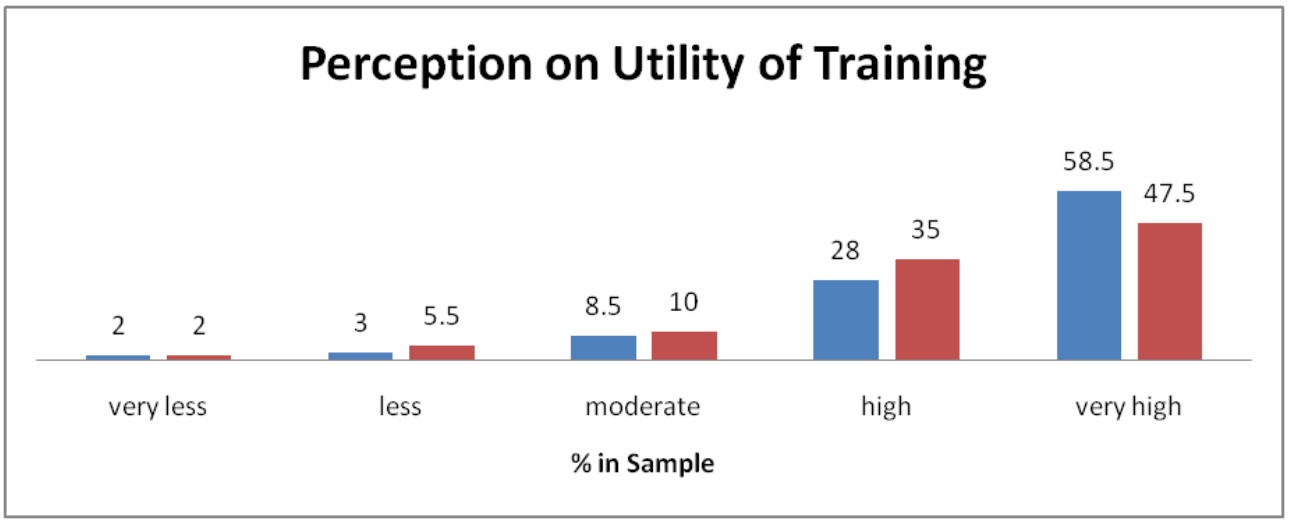


Figure 3.2.54: Perception on Utility of Training

It is observed that among the Karnataka sample respondents, 39%, 35.5% and 25.5% have observed ICT demonstration during the months of March, April and May, respectively. In Jharkhand sample, 37.5%, .4% and 28.5% of the sample respondents participated in ICT demonstration sessions during November, December and January, respectively.

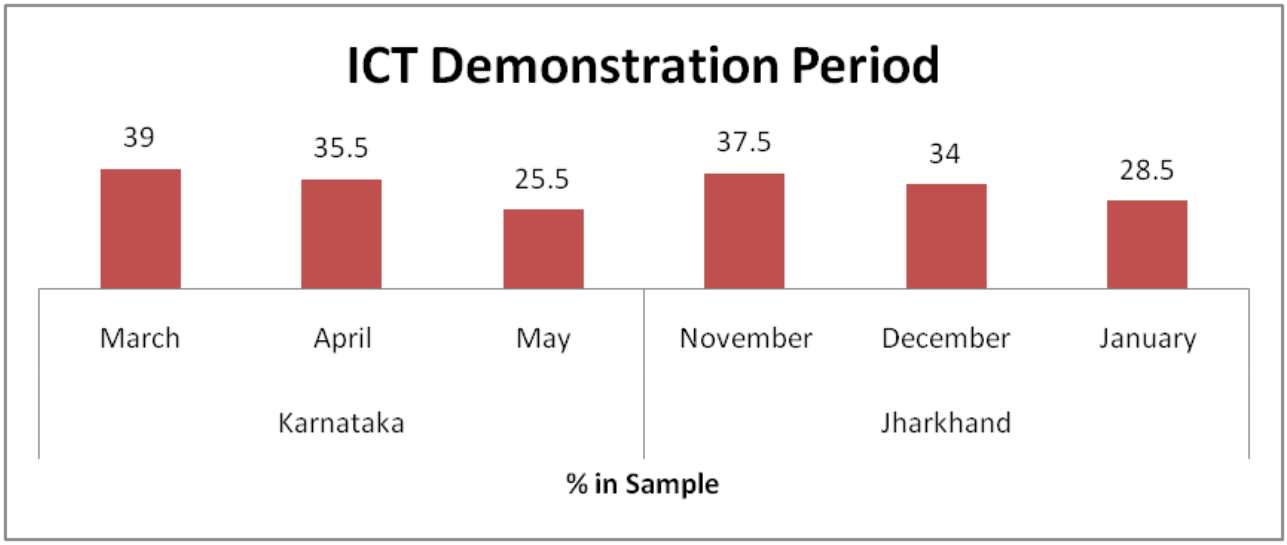


Figure 3.2.55: ICT Demonstration Period

It is observed that 70% of the Karnataka sample and 55% of the Jharkhand sample were educated through videos. Similarly, 98% of the Karnataka sample and 80% of the Jharkhand sample were educated on various livelihood related aspects through wall paintings. About 86% of Karnataka sample and 88% of the Jharkhand sample learned various aspects of livelihood through street plays. Brochures are used to enhance the knowledge levels of 55.5% of Karnataka sample and 75% of Jharkhand sample. Similarly, 43% of Karnataka sample and 56% of Jharkhand respondents learned through pamphlets.

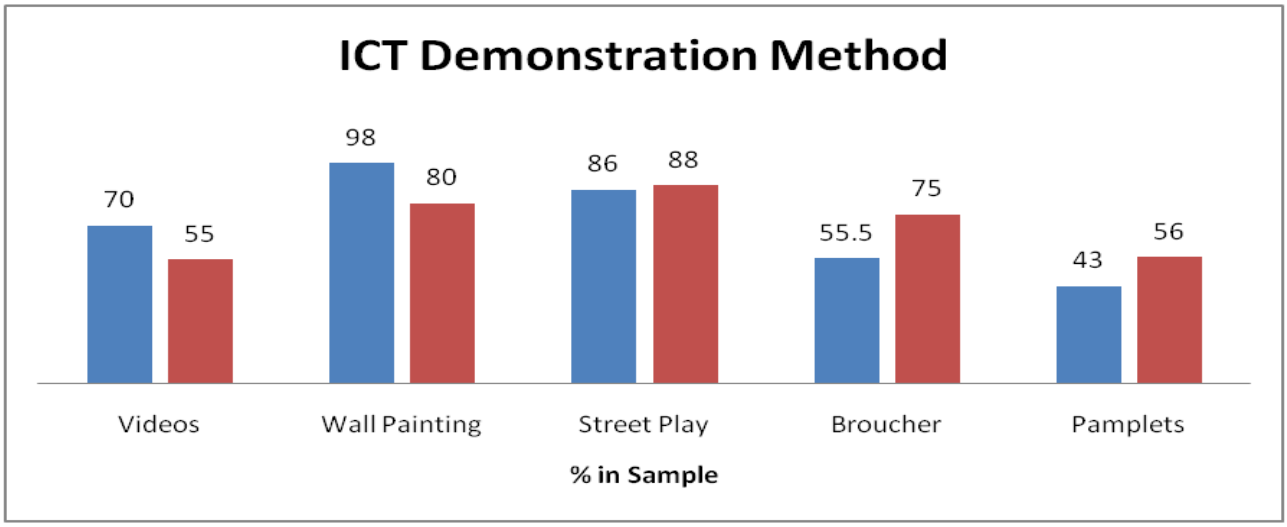


Figure 3.2.56: ICT Demonstration Method

It is found that 11% of Karnataka sample and 12.5% of Jharkhand sample respondents were given orientation through five ICT methods, whereas four methods were used to provide orientation to 50% of Karnataka and 51% of Jharkhand sample respondents. A significant proportion of the sample, i.e. 25.5% of Karnataka sample and 28% of Jharkhand sample got orientation through three types of ICT methods and 13.5% of Karnataka sample and 8.5% of Jharkhand sample secured orientation through only two ICT methods.

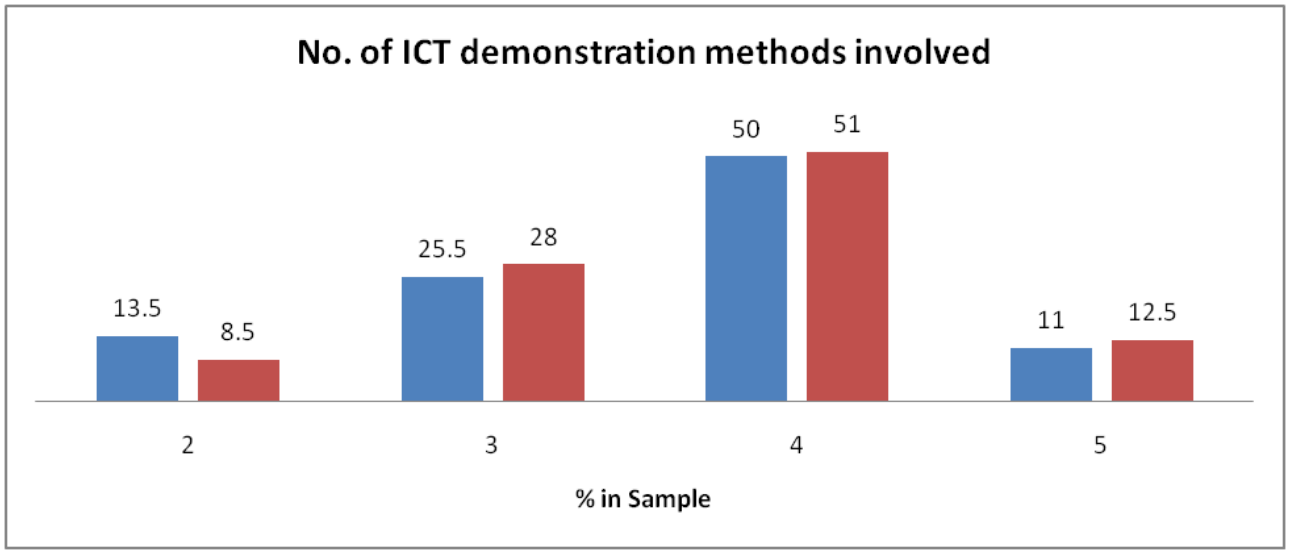


Figure 3.2.57: No. of ICT Demonstration Methods Involved

During the survey, 74.5% of Karnataka sample and 75% of Jharkhand sample participated in ICT demonstration on organic farming. The SRI cultivation method was demonstrated to about 92% and 98% of the sample respondents. Similarly, 91% of the sample in each state have had a demonstration on FYM preparation. Among the demonstrated aspects, 75% of the Karnataka sample and 72% of the Jharkhand sample participated in a demonstration on inter-cropping methods. The knowledge about small ruminants rearing was demonstrated to 98% of Karnataka sample and 95% Jharkhand sample respondents. Whereas the knowledge on livestock rearing was demonstrated to 81% and 79% sample respondents of Karnataka and Jharkhand, respectively. The backyard poultry knowledge was disseminated to 45.5% of Karnataka sample and 39% of Jharkhand sample. A proportion of 50.5% of Karnataka sample and 60% of Jharkhand sample was demonstrated through azolla cultivation methods. The knowledge on limewater was given to 17.5% Karnataka sample and 25% of Jharkhand sample respondents. Similarly, 14.5% of the sample in Karnataka and 38% of the Jharkhand sample were demonstrated with cow urine preparation methods.

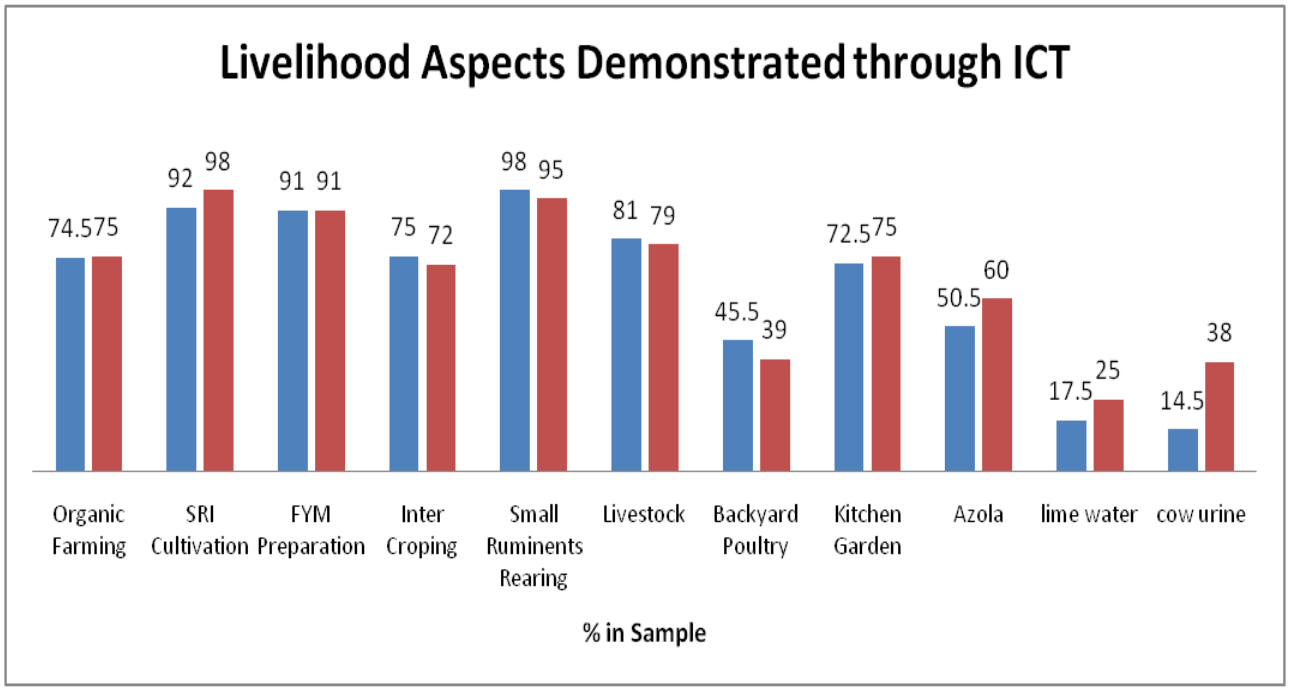


Figure 3.2.58: Livelihood Aspects Demonstrated through ICT

It is found that 77% of the Karnataka sample and 85.5% of the Jharkhand sample were demonstrated with 5-10 livelihood aspects and 10.5% of the sample in each state were demonstrated with more than eleven aspects and 12.5% of Karnataka sample and 4% of Jharkhand sample were demonstrate through 1-5 aspects of livelihood concern.

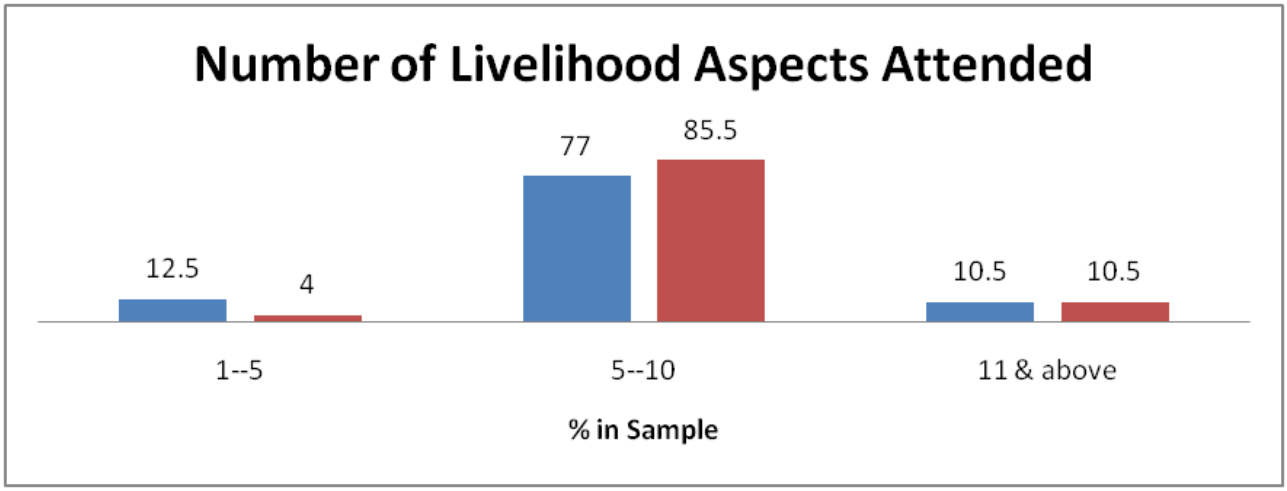


Figure 3.2.59: Number of Livelihood Aspects Attended

Among the study respondents, 64.5% of the Karnataka sample and 75% of the Jharkhand sample perceived ICT demonstrations with high utility towards their livelihood. About 22.5% of Karnataka sample and 19.5% of Jharkhand sample expressed that ICT demonstration has a high utility. Whereas 6% of Karnataka sample and 3.5% of Jharkhand sample perceived ICT demonstrations was with moderate utility. On the other hand, 4.5% of Karnataka sample and 1% of Jharkhand sample perceived these

demonstrations with less utility and 2.5% of Karnataka sample and 1% of Jharkhand sample perceived the utility of these demonstrations as very less.

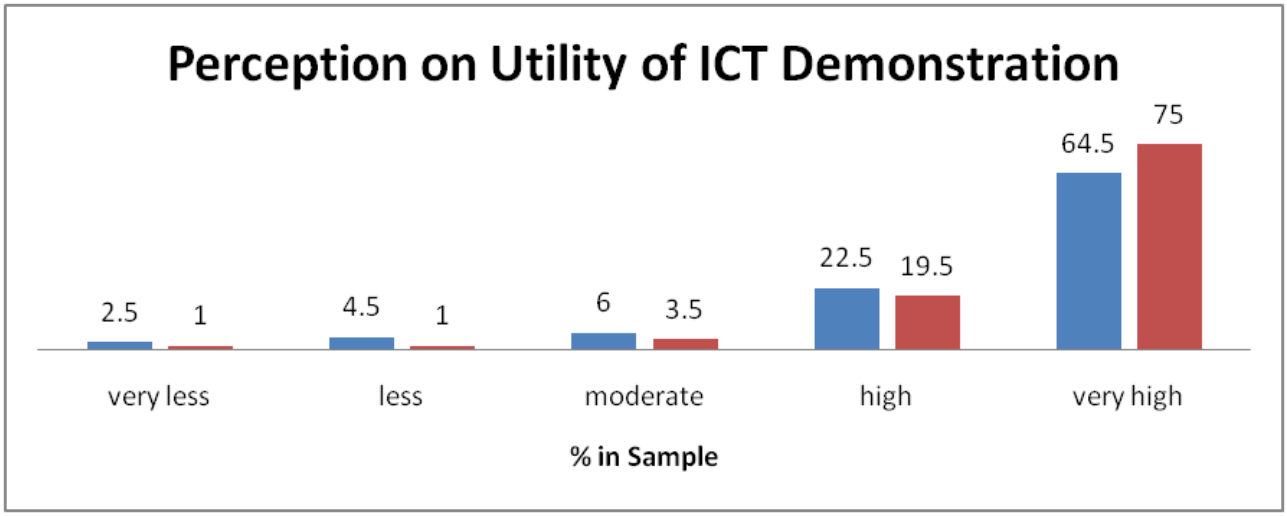


Figure 3.2.60: Perception on Utility of ICT Demonstration

All the respondents of the study made several changes in their livelihood in view of their enhanced capacity that earned through capacity building programmes. It is observed that, in Karnataka, 66.5% of sample respondents implemented integrated farming practices in their livelihood processes. Whereas crop diversification and improved livestock rearing were adopted by 89% and 76% of the sample respondents, respectively. About 98% and 94.5% and 88% of sample adopted improved technological practices, horticulture crop cultivation practices and organic farming cultivation, respectively. In Jharkhand, majority of the sample (88%) adopted organic farming practices in their livelihood and 71% of the sample implemented organic fertilizers and pesticides and only 29.33% of sample adopted integrated farming techniques.

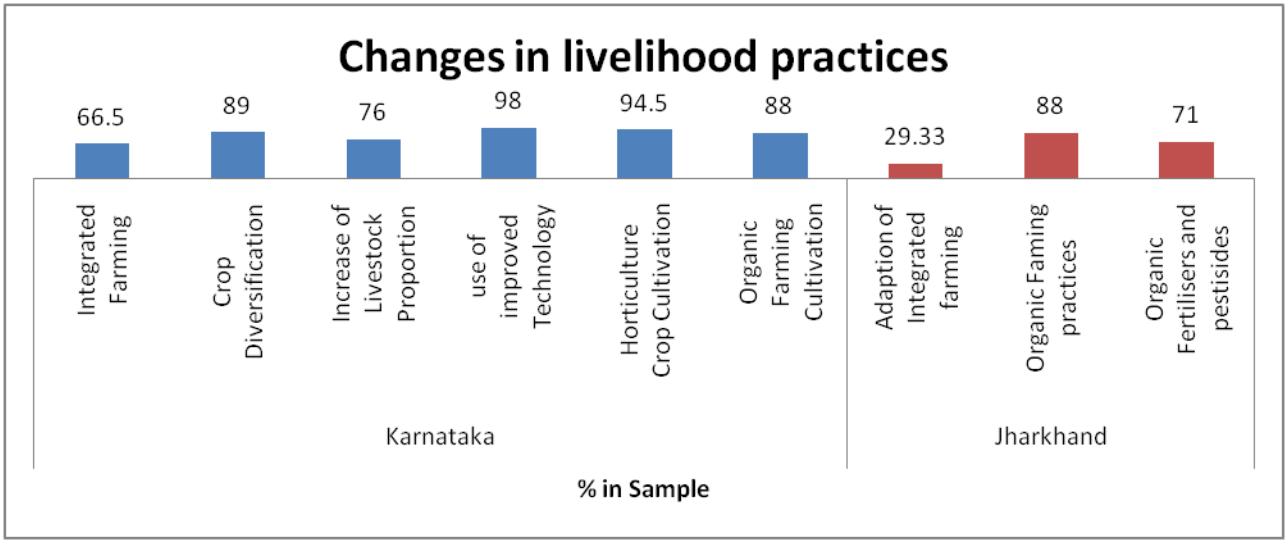


Figure 3.2.61: Changes in Livelihood Practices

It is observed that 55% of sample respondents in each State have adopted two improved methods in their livelihood processes. Similarly, 33.5% of Karnataka sample and 35% of Jharkhand sample stated that they have implemented three improved methods relating to their livelihood operations. On the other hand, 1.5% and 2.5% of Karnataka sample adopted four and five improved practices, respectively. Whereas 7.5% of Karnataka sample and 10% of Jharkhand sample reported that they have adopted only one improved practice in their livelihood operations.

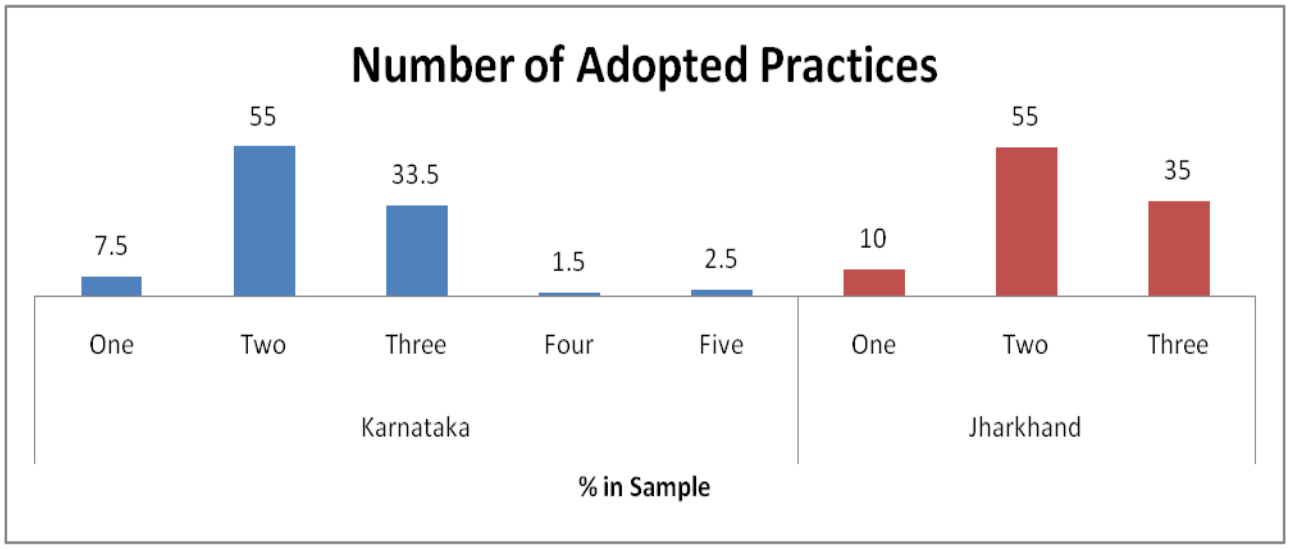


Figure 3.2.62: Number of Adopted Practices

It is found that among the study respondents 100% of Karnataka sample reported that their livelihood has been improved after the adaptation of improved practices in their livelihood processes. Whereas 92.5% Jharkhand sample reported that their livelihood was improved after the adaptation of improved practices and only 7.5% of Jharkhand sample reported that there was not much improvement in their livelihood even after the adaptation of improved practices.

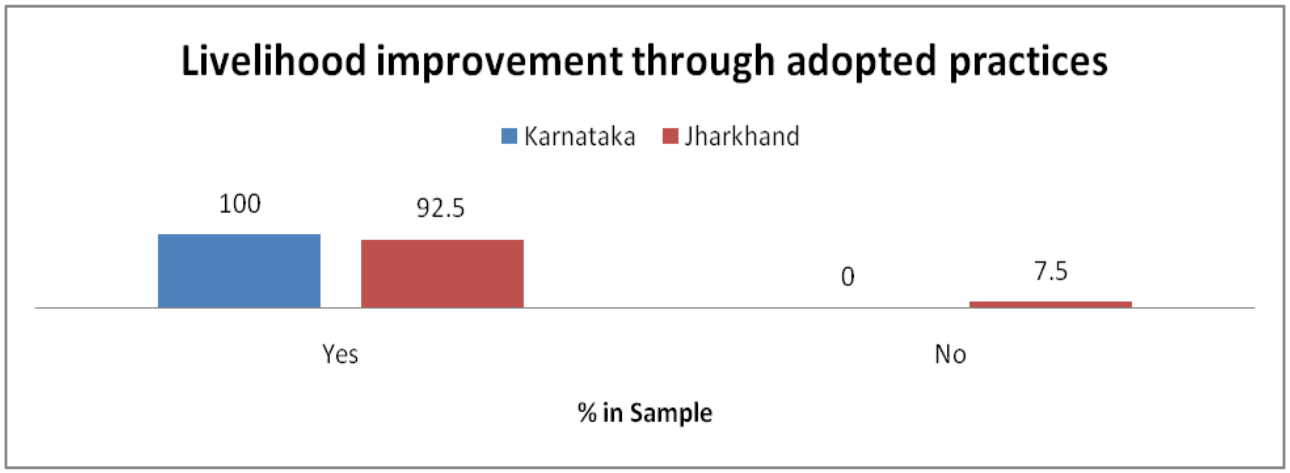


Figure 3.2.63: Livelihood Improvement through Adopted Practices

During the survey majority of the sample, i.e. 78.5% of Karnataka sample and 66.5% of Jharkhand sample, perceived that the utility of the adopted practices toward their livelihood improvement is very high whereas 12% and 16% of the respective State's sample perceived it as high. On the other hand, 4% and 2.5% of Karnataka sample and 5.5% and 7% Jharkhand sample perceived the utility of the adopted practices as very less and less, respectively.

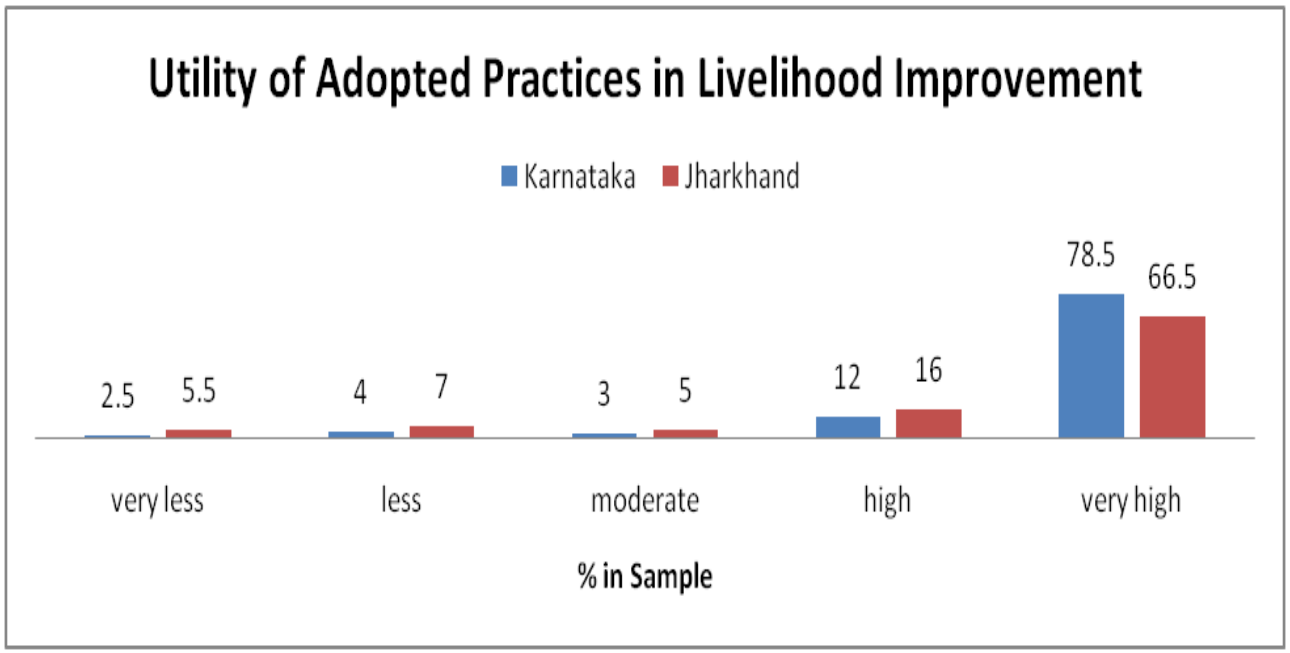


Figure 3.2.64: Utility of Adopted Practices in Livelihood Improvement

It is also observed that there has been great variation in the area cultivated by the sample respondents over the years. In Karnataka, previously, majority of the sample respondents' (91.5%) cultivated area ranging between 1.5 and 2.0 Ha. It is evident that there is a significant improvement in the individuals' landholding size over the years. It is observed that the percentage of sample who has cultivated more than two acres is increased from 1% to 80%. In contrary to the trend, the proportion of sample whose cultivated area falls between 1.5 and 2 Ha is decreased from 91.5% to 18.5%. Over the years, the number of sample respondents who have cultivated less than 1.5 Ha is also decreased from 7.5% to 1.5%. Whereas in Jharkhand, the number of respondents whose cultivated area ranges between 1.5 and 2.0 Ha and is increased from 37.5% to 67.5%. But the number of sample respondents whose cultivated area is less than 1.5 Ha is declined from 47.5% to 25%. Similarly, the size of the respondents, who have been cultivating more than 2 Ha is also decreased from 15% to 7.5% in Jharkhand.

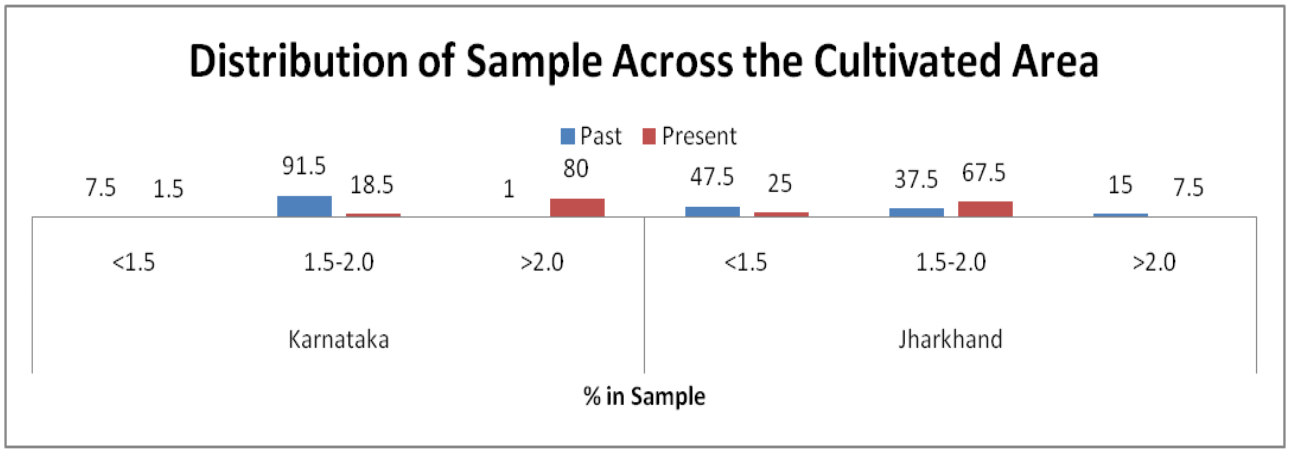


Figure 3.2.65: Distribution of Sample Across the Cultivated Area

The cropping pattern of the study villages exhibits great change over the period in both states. It is observed that there was a mono-cropping system followed in the field of respondents and later converted into multiple cropping systems in study villages of Karnataka. Previously, in Karnataka, across the total cropped area of the respondents, 49% of the area cropped under ragi and 25% was under Red gram and 15% was under Cowpea and 10% was under Horse gram and 1% cropped with Other crops. On the other hand, across the current cropped area of Karnataka respondents, 30% is cropped with a mixed crop of ragi, red gram, cowpea and horse gram; 40% of the area is cropped with vegetables and 30% of the area cropped with other horticulture and commercial crops.

There was also variation evident in the cropping pattern of the Jharkhand State. The area under paddy was relatively constant over the years. But there is a significant increase in the area under SRI paddy cultivation from 10% to 25% and in contrast to this, the area under maize is declined from 25% to 10%. The similar trend is also observed with wheat cropped area, it is declined from 20% to 10%. As a complementary to the declining trend of earlier crops, there has been an increase in area under vegetable crops from 10% to 25%.

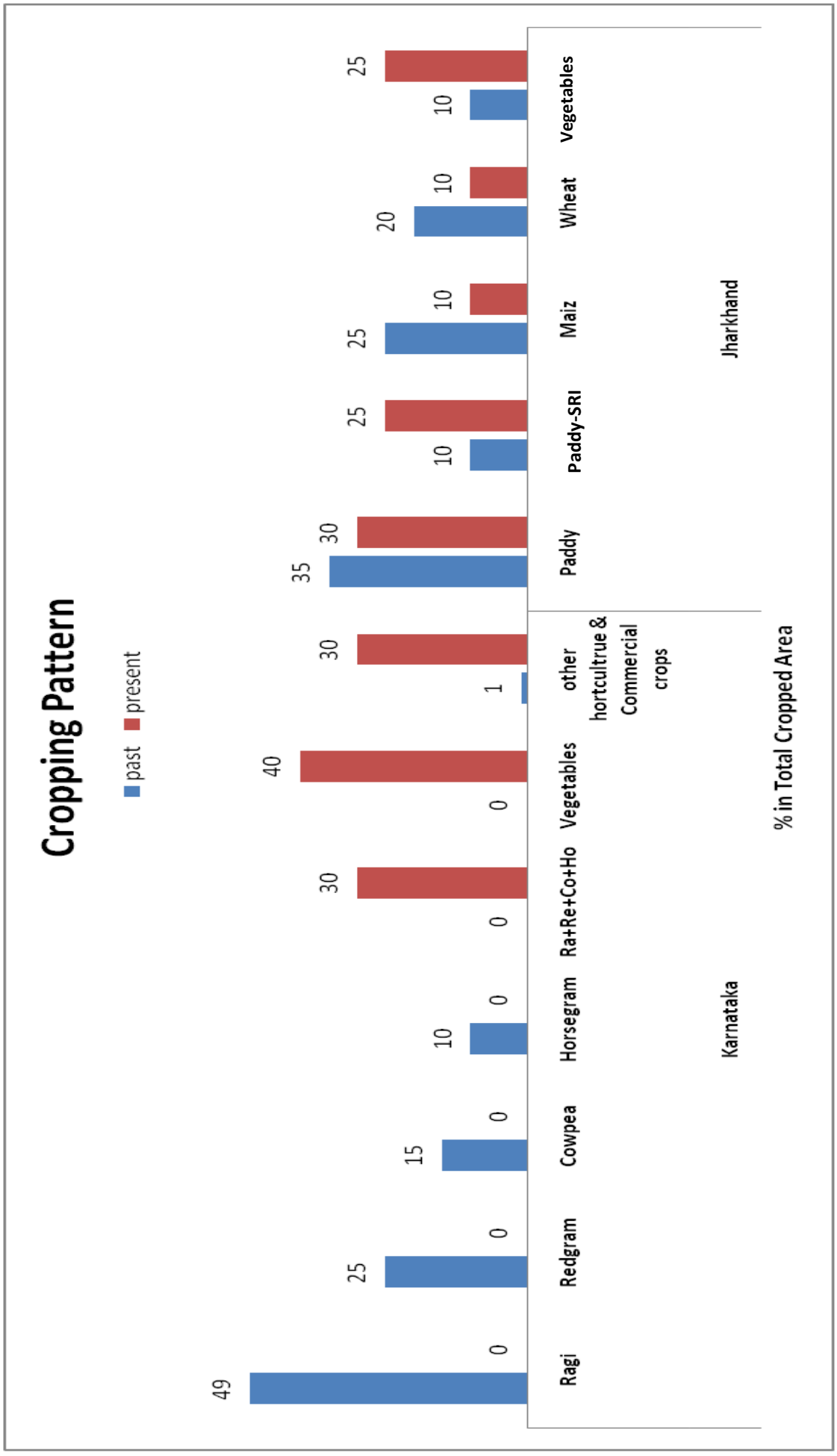


Figure 3.2.66: Cropping Pattern

In Karnataka, it is calculated from the primary data that collection on crop production detail that the cumulative average area of group of crops like ragi, red gram, cowpea and horse gram has increased from 0.99 Ha to 1.0 Ha. The average area of horse gram is constant with 0.98-0.99 Ha throughout the reference period of the study. In the same vein, the average area under horticulture crops, i.e. 1 Ha., is also constant throughout the reference period. There is a significant increase observed in the average area under vegetables from 0.43 to 1.02 Ha.

In Jharkhand, a significant increase is observed in the average area of vegetable from 0.77 to 1.44 Ha. It is observed that the average area of paddy is constant with 0.99 Ha during the study period. The average area of SRI paddy is increased from 1.42 to 1.58 Ha. There is a slight decrease in the average area of maize from 1.31 to 1.2 Ha. The wheat average area is increased from 1.18 to 1.15 Ha.

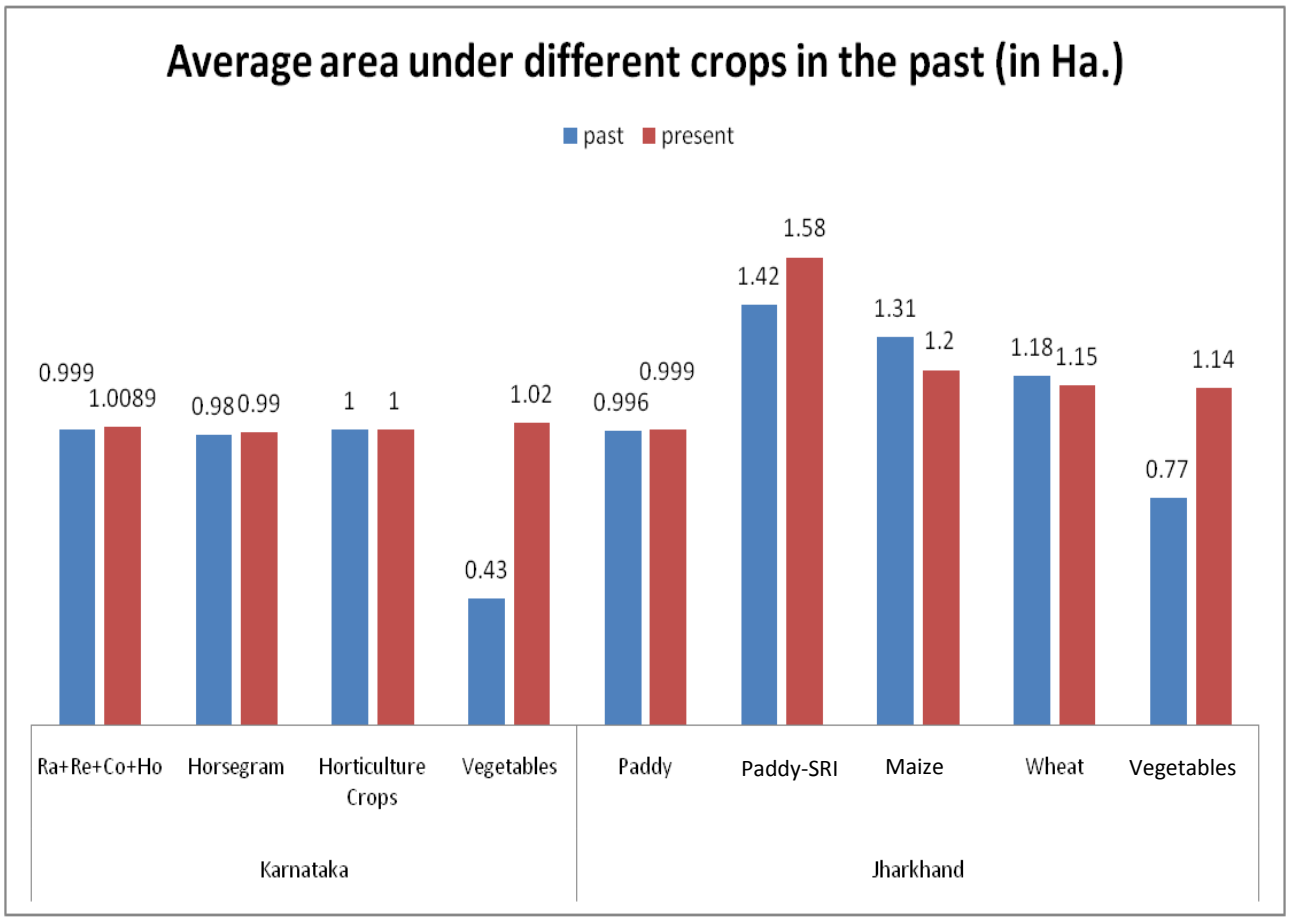


Figure 3.2.67 Average Area under Different Crops in the Past (in Ha)

It is evident that the average production of various crops has been increased over the years. The per hector average production of Karnataka sample respondents disclosed that the average production of horse gram increased from 3.23 quintals to 8.12 quintals. In the same manner, the production of horticultural crops increased from 6.74 to 9.28 quintals. The combined average production of ragi, red gram, cowpea and horse gram per hector increased from 15.49 to 31.16 quintals. It is also observed that the average production of vegetables increased from 10.77 to 41.54 quintals.

Similarly, the average production of various crops in the Jharkhand has also been increased. The average production of the paddy crop increased from 23.35 to 41 quintals per hector and in SRI cultivation method, it increased from 46 to 50 quintals. The average production of the maize crop improved from 49.14 to 55.6 quintals. It is also observed that the average production of wheat improved from 21.63 to 31.5 quintals. There has been a sharp increase in the average production of vegetables from 17.43 to 86.35 quintals per hectare.

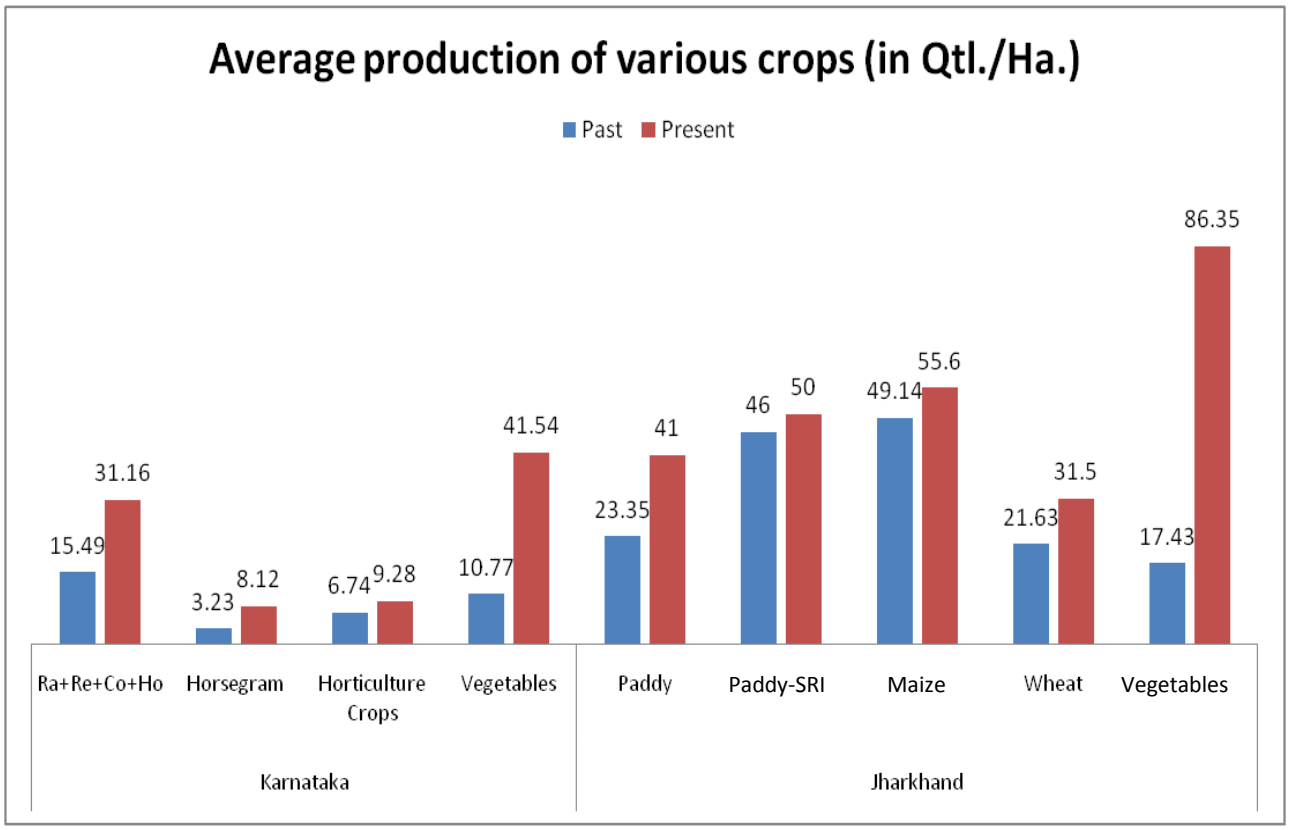


Figure 3.2.68: Average Production of Various Crops (in Qtl./Ha)

Over the years, it is found that the cost of production for various crops has been increased in both States. In Karnataka, the average cost of production for the combined production of ragi, red gram, cowpea and horse gram per hector increased from Rs. 22,252 to Rs. 23,600 and for horse gram cultivation, it increased from Rs. 1471 to Rs. 1814. There is a slight increase in the cost of production of horticulture crops - from Rs. 74,388 to Rs. 80,000 per hectare. There is a sharp increase in the cost of production of vegetable from Rs. 1549 to Rs. 24,475 per hectare. In Jharkhand, there has been a sharp increase in the cost of production from Rs. 40,000 to Rs. 89,227 for paddy crop per hectare and from Rs. 25,000 to Rs. 52,335 for paddy cultivation under SRI system. A significant increase is observed in the cost of production of maize crop from Rs.47,695 to Rs. 53,772 and a similar increase is observed in case of wheat where the average cost of production has increased from Rs. 18,935 to Rs. 21,651. The average cost of production for the cultivation of vegetables has increased from Rs. 3490 to Rs. 22,000 per hectare.

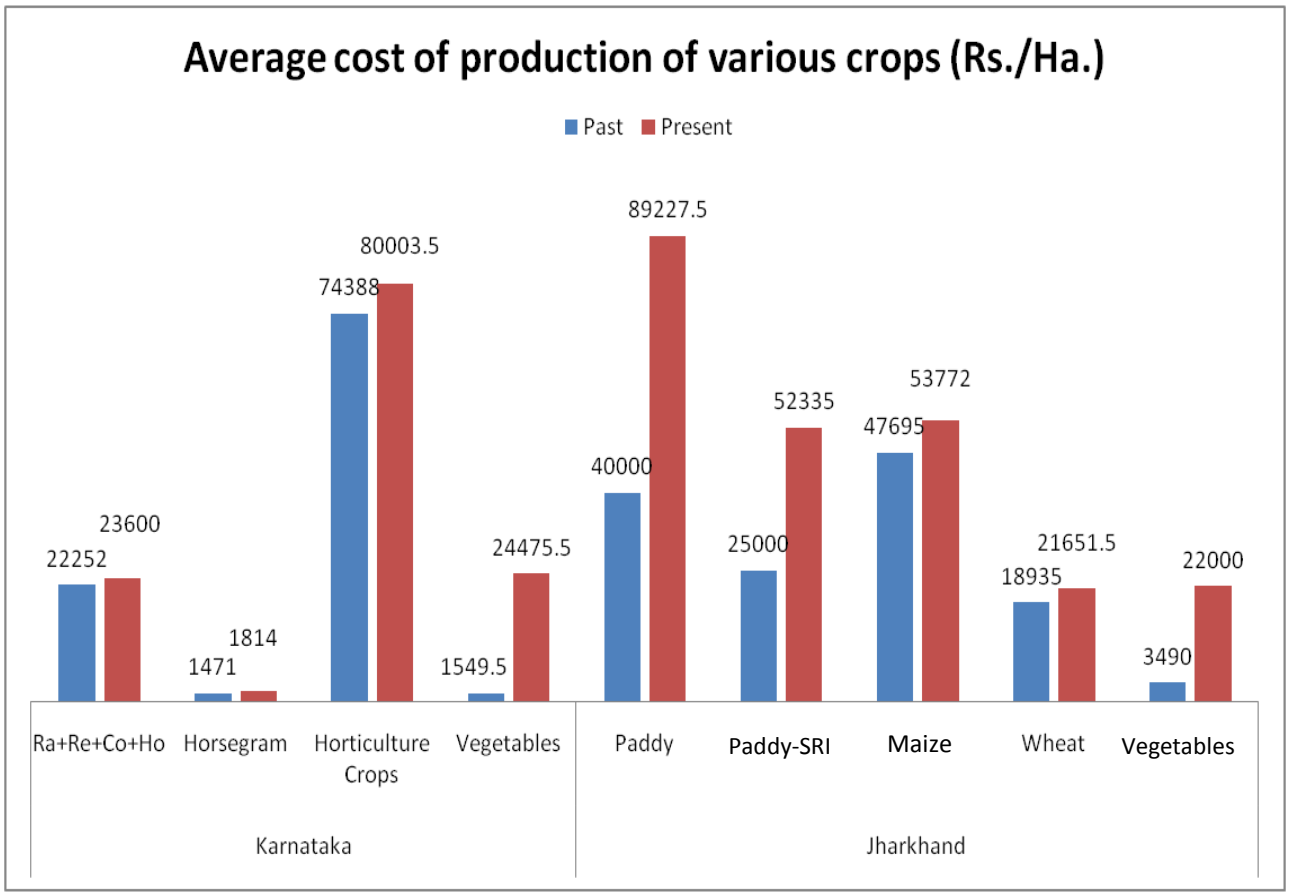


Figure 3.2.69: Average Cost of Production of Various Crops (Rs./Ha)

In Karnataka, the average price for the horsed gram increased from Rs. 2205 to Rs. 2400 per quintal and for vegetable the average price per quintal increased from Rs. 1130 to Rs. 2259. The combined average price for red gram, ragi and cowpea increased from Rs. 1537 to Rs. 1854. A substantial increase is observed in the average price for the horticulture crops - it is increased from Rs. 13,525 to Rs. 17,722 per quintal over the study period. In Jharkhand, the average price for the paddy per quintal increased from Rs. 1051 to Rs. 1254 and for SRI paddy. it increased from Rs. 1200 to Rs. 1250. The average price for the Maize increased from Rs. 1368 to Rs. 1646 and there is an increase in the average price from Rs. 1456 to Rs. 1652 and the average price for the vegetable increased from Rs. 648 to Rs. 940 per quintal of production over the study period.

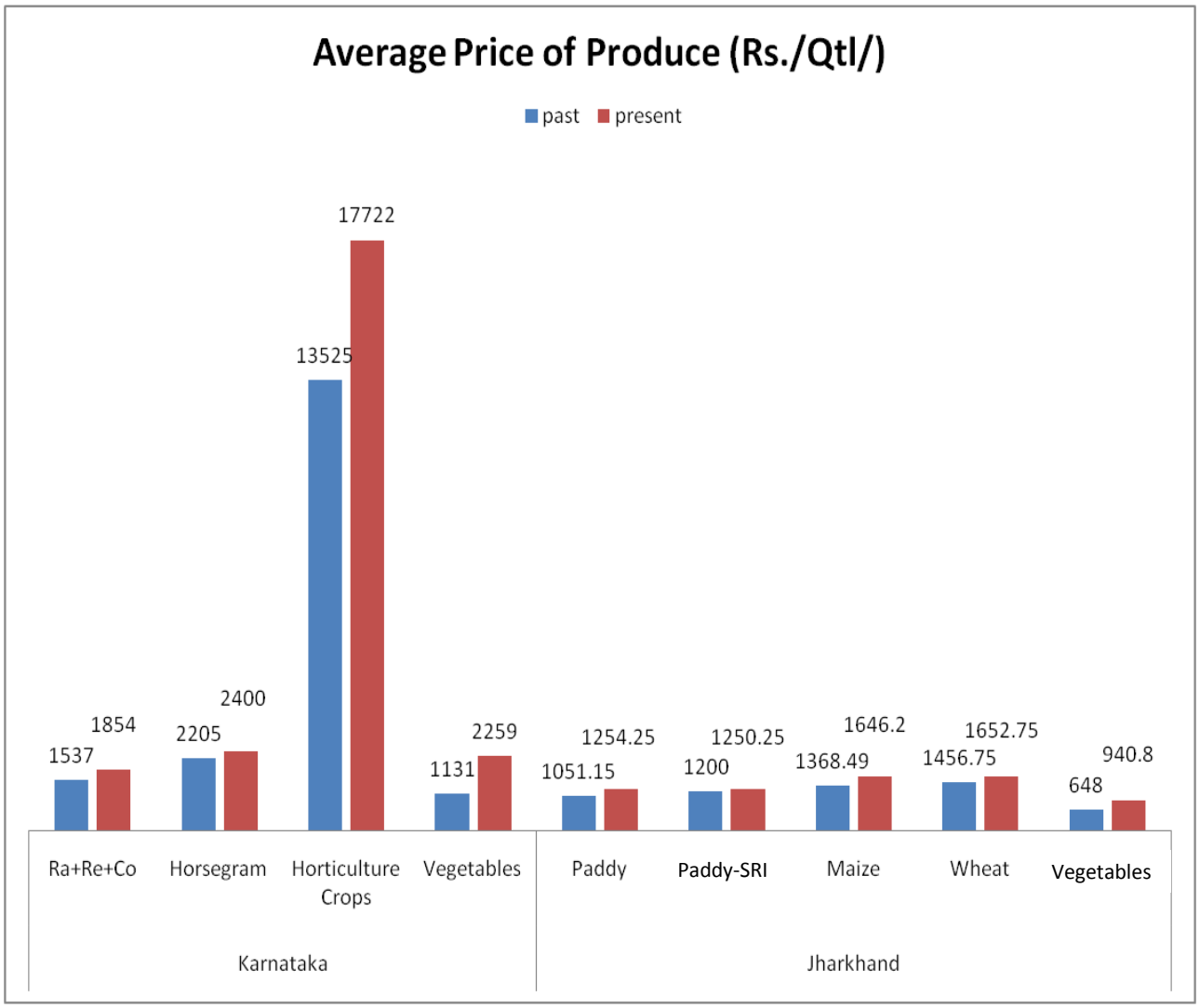


Figure 3.2.70: Average Price of Produce (Rs./Qtl)

It is observed that among the total produce, the average produce that marked over the period has increased for all types of produces. In Karnataka, the combined average marketed produce of ragi, red gram and cowpea increased from 14.34 to 27.8 quintals and for horse gram, it increased from 2.39 to 7.85 quintals. The average marketed produce for horticulture crops also increased from 5.8 to 8.61 quintals. The average marketed produce of vegetables significantly increased from 2.4 to 29.7 quintals. In Jharkhand, a significant increase observed for paddy from 22.21 to 40.99 quintals. The average marketed produce of maize reported a substantial increase from 46 to 91.18 quintals, whereas the average production marketed produce of wheat increased from 21.12 to 31.06 quintals. A huge increase has been observed in the marketed produce of the vegetables from 8.28 to 172.2 quintals.

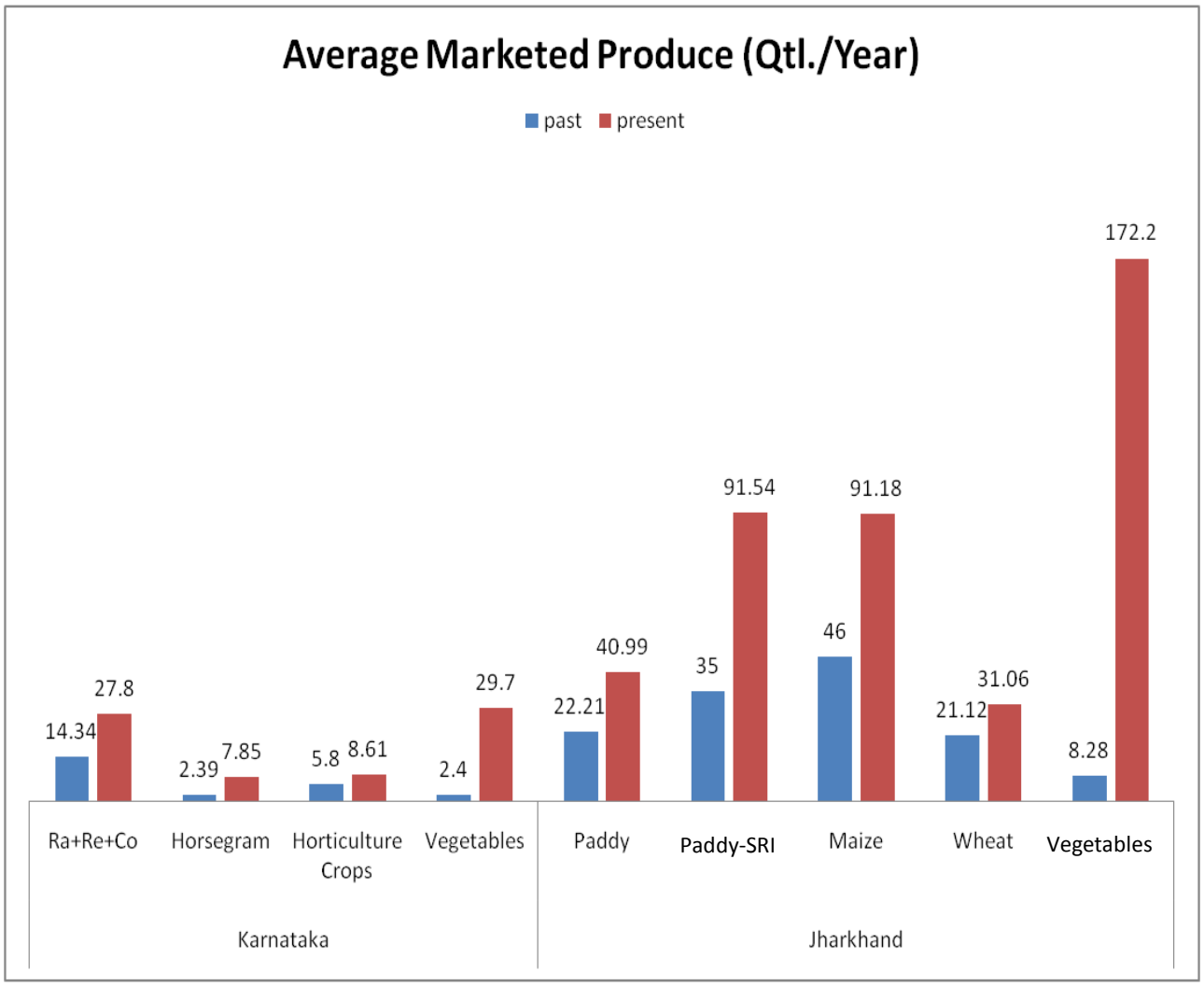


Figure 3.2.71: Average Marketed Produce (Qtl./Year)

It is found that over the years, the proportion of household consumption in total produce has changed across various crops. In Karnataka, the average household consumption of vegetables increased from 8.3 to 11.7 quintals. Similarly, the horse gram consumption by household increased from 0.5 to 1.7 quintals. No much change is observed in the combined average consumption of ragi, red gram and cowpea with 2.0 to 2.1 quintals. The average consumption of horticulture crops by household decreased from 1.38 to 0.66 quintals. In Jharkhand, the average household consumption of paddy is declined from 2.57 to 1.14 quintals and for SRI paddy it is decreased from 2.3 to 1.52 quintals. The average household consumption of maize reported a constant trend over the years with 1.5 to 1.6 quintals over the years, whereas the average household consumption of vegetables increased from 8.15 to 14.6 quintals. A similar trend is also observed in the average household consumption of wheat with the increase from 0.8 to 1.7 quintals.

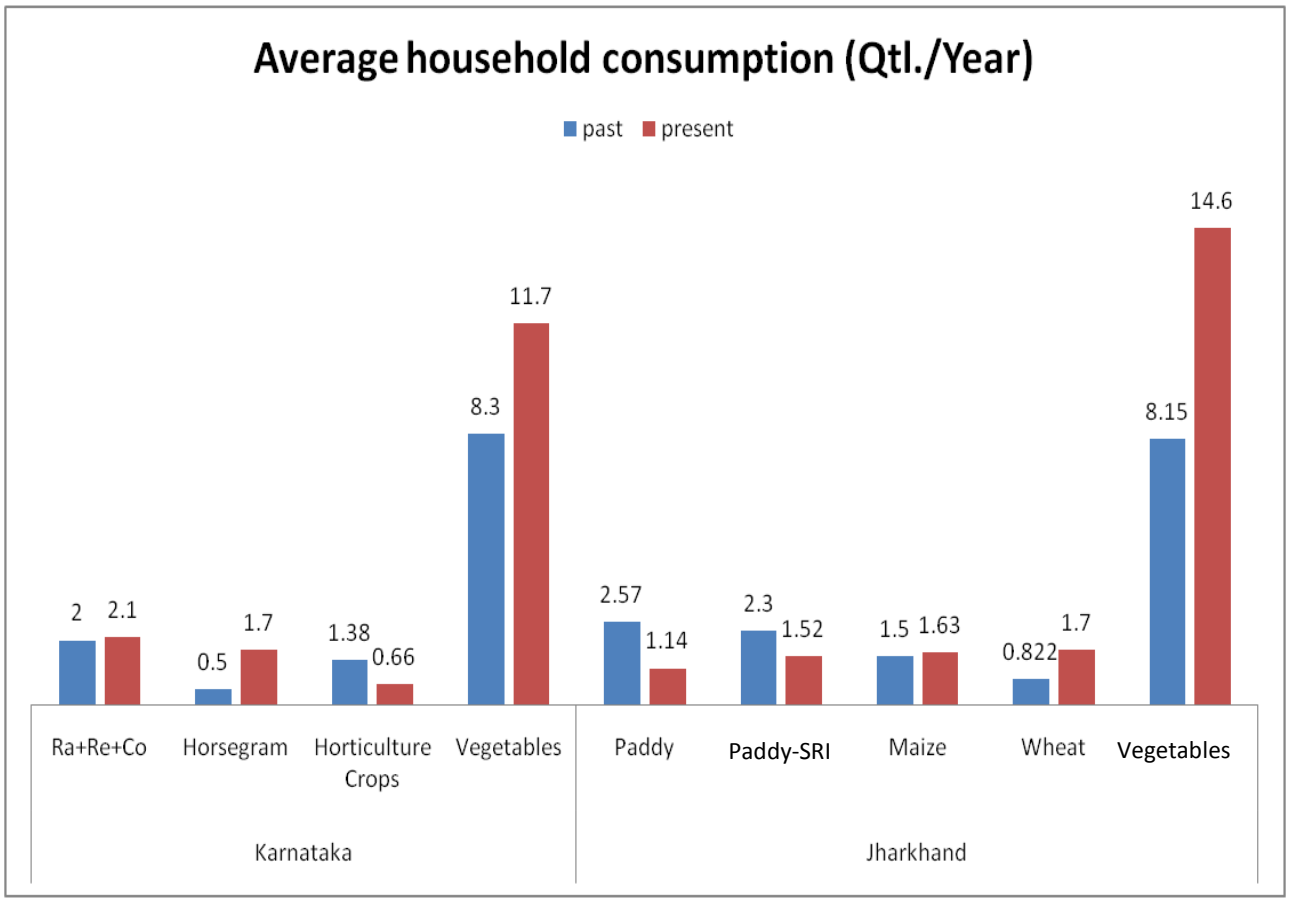


Figure 3.2.72: Average Household Consumption (Qtl./Year)

It is evident from the gross income analysis that there has been a significant increase in gross revenue of various crops. In Karnataka, The combined gross income of ragi, red gram and cowpea increased from Rs. 24,202 to Rs. 43,785. Over the years, the gross income of horse gram has increased from Rs. 6241 to Rs. 19,650 and for the vegetable it is increased from Rs. 2621 to Rs. 67,234. There is a sharp increase in the average gross income of horticulture crops from Rs. 90,393 to Rs. 1,64,266. In Jharkhand, the average gross income of paddy has increased from Rs. 20,046 to Rs. 48,257 and for SRI paddy it has increased from Rs.30,000 to Rs. 1,09,395 and for wheat, it increased from Rs.28,522 to Rs. 47,656 and for maize, it increased from Rs.63,651 to Rs. 1,37,420. A great increase has been observed in the average gross income for vegetable from Rs.6093 to Rs. 1,54,142.

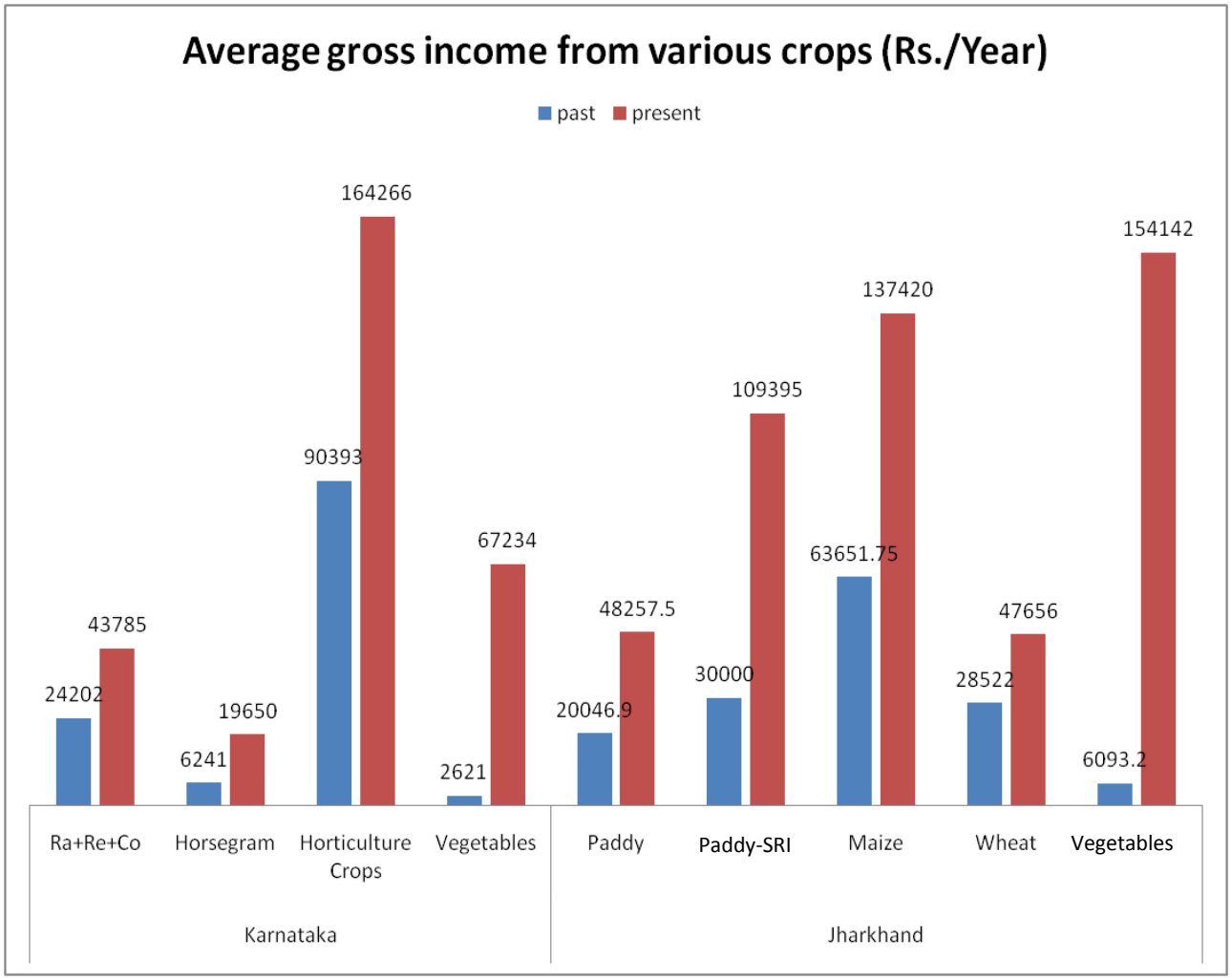


Figure 3.2.73: Average Gross Income from Various Crops (Rs./Year)

There has been a sea of increase observed in the net income from all the crops in the study villages. In Karnataka, the combined net income from ragi, red gram and cowpea increased from Rs. 2461 to Rs. 29,484 and for horse gram, it increased from Rs. 4673 to Rs. 18,408 and for vegetables, it increased from Rs. 1043 to Rs. 24,365. There is a very substantial increase in the net income of horticulture crop from Rs. 16,005 to Rs. 84,263. In Jharkhand, a very high increase is observed in the net income of maize crop from Rs. 16,010 to Rs. 87,794 and for paddy, it increased from Rs. 1043 to Rs. 42,759 and for SRI paddy it increased from Rs. 1900 to Rs. 56,446. The net income from wheat has increased over the years from Rs. 9377 to Rs. 27,460 and a similar trend is observed in vegetable crops' net income which has increased from Rs. 3042 to Rs. 64,688.

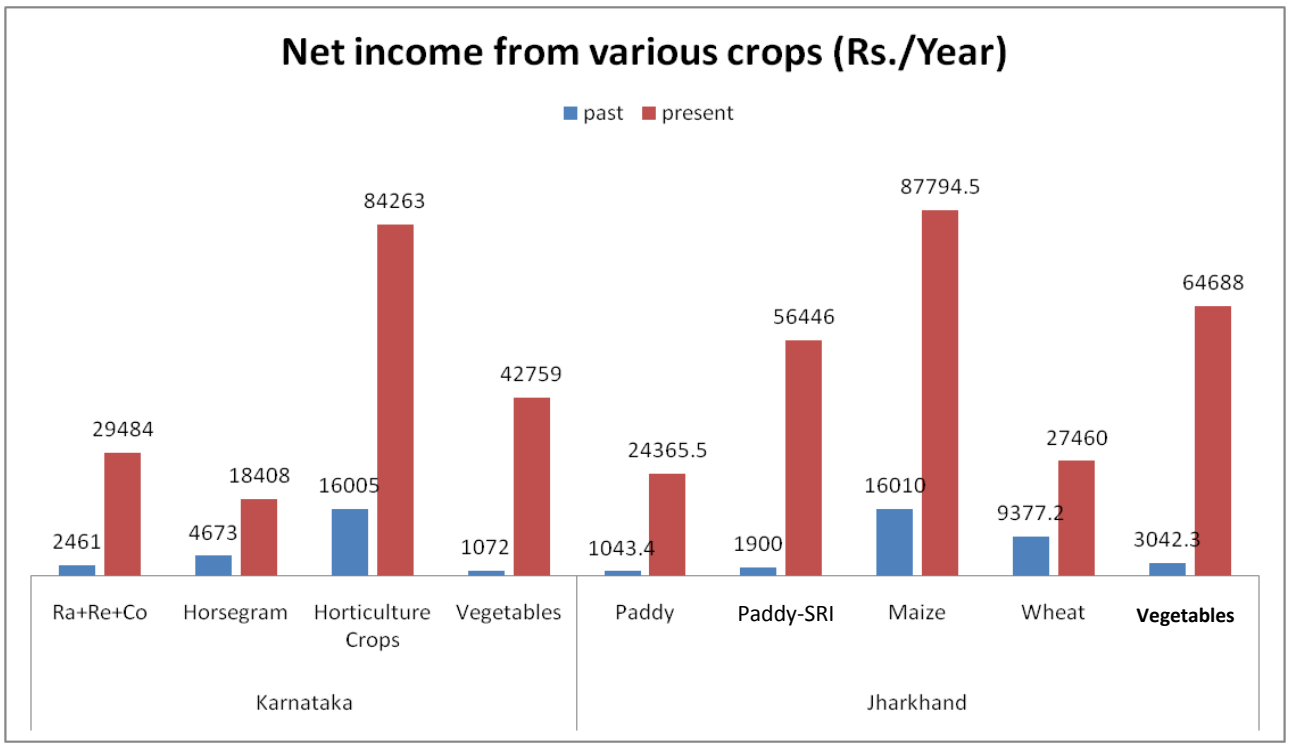


Figure 3.2.74: Net Income from Various Crops

Animal rearing has been the major activity of respondents in the Karnataka State. In Karnataka, it is observed that the average annual number of animals in a household increased from 2.10 to 3.97. The average yield from the animal has increased from 5.02 to 14.28 ltr./day, which resulted in increase in household consumption from 0.77 to 0.99 ltr./day. A significant increase is also observed in the price of the milk from Rs. 17.4 to Rs. 25.20. The total number of yielding days in a year has also increased from 117.8 to 192 days. The average cost of animal rearing has increased from Rs. 7119 to Rs. 19,191. The annual gross income from animal rearing has increased from Rs. 8723 to Rs. 67,167,

which resulted in increase in net income from Rs. 1604 to Rs. 47,976. In Jharkhand, all the respondents of the study reported that they have not reared any animals in the past and started rearing animals after the training sessions. It is observed that the average number of animals per household is around two per annum and they yield up to 8.13 ltr/day. The household consumption is about 1.18 ltr/day and the price of the milk is averaged at Rs. 23.5. On average, there are 214 yield days in a year and the cost of production for the rearing of animals is up to Rs. 15,306. The households earned an average gross income of Rs. 31,648 with a net income of Rs. 16,342.

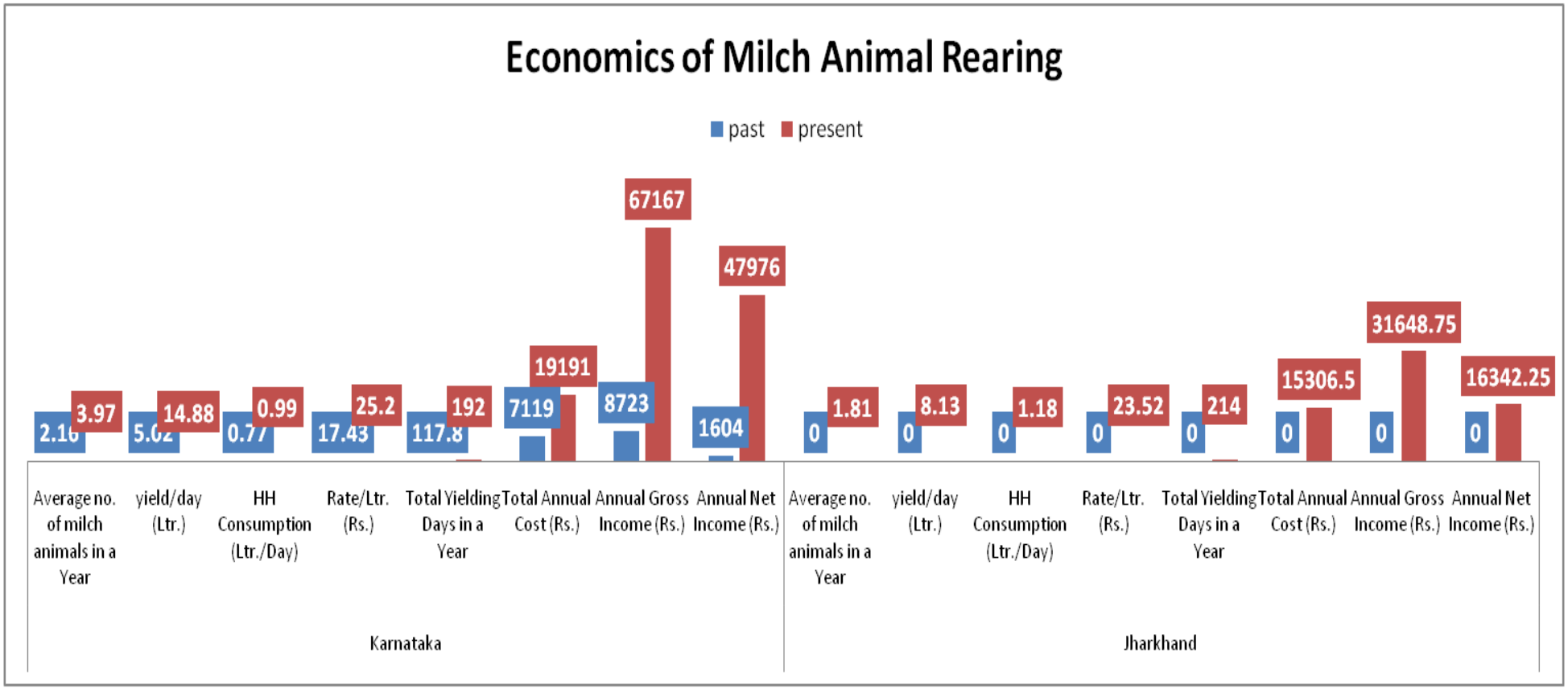


Figure 3.2.75 Economics of Milch Animal Rearing

The respondents of both States reported that they have not reared any small ruminants like sheep and goats prior to their training period. Afterwards, the rearing of small ruminants has become a major livelihood activity. The average number of goats and sheep reared by the household in any year is 5.67 and the total labour cost incurred for the rearing is Rs. 8,243 per annum. It is reported that the average price of the animal is Rs. 4,673. Households, on average, secured Rs. 26,484 as gross income with average net income of Rs. 18,241.

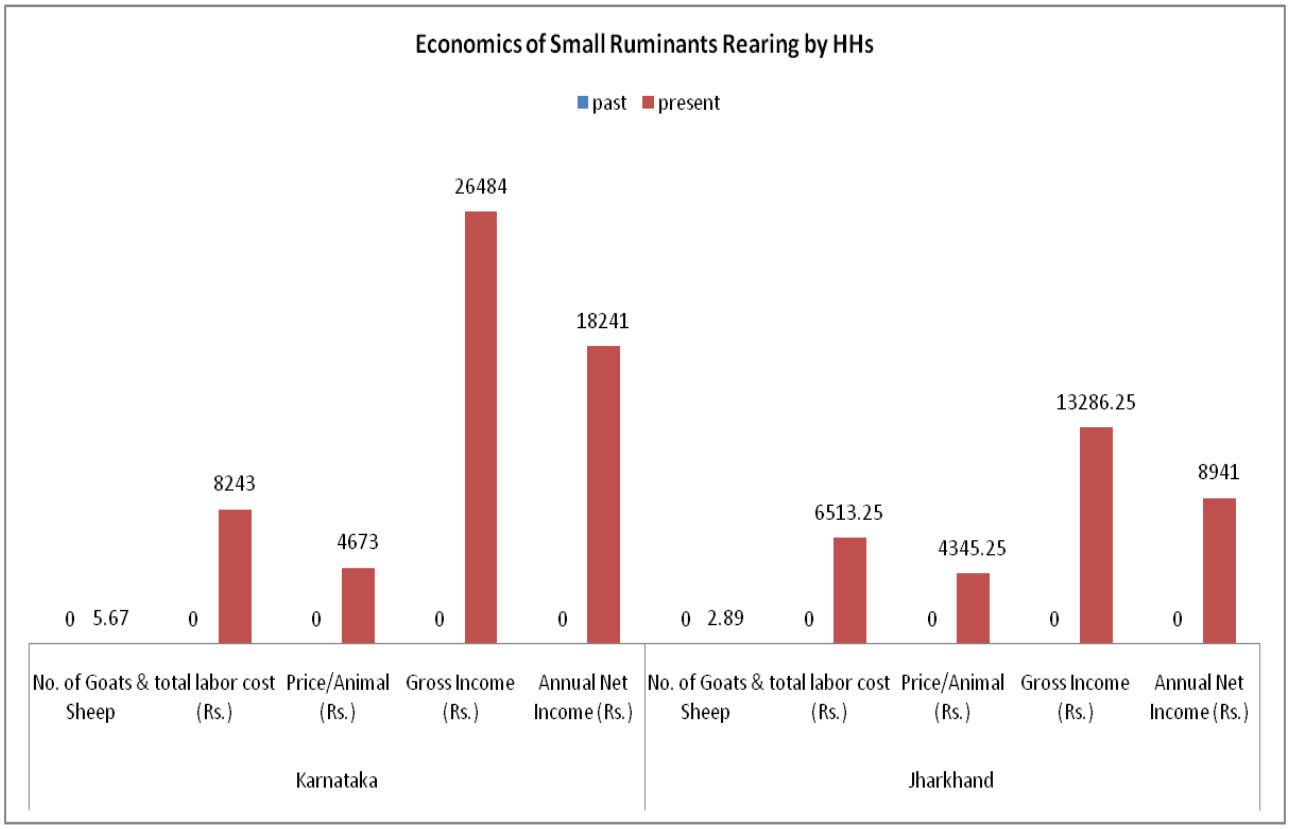


Figure 3.2.76: Economics of Small Ruminants Rearing by HHs

All the respondents of the study reported that they have also undertaken poultry rearing of in their backyards since their training sessions. The average number of chicken reared per household in a year is 64 in Karnataka and 26 in Jharkhand whereas the average weight of the bird is 2681 gm in Karnataka and 4311 gm in Jharkhand. It is reported that the average number of eggs produced by a household per annum is 230 in Karnataka and 259 in Jharkhand. The average price realised per kg of bird flesh is Rs. 95 in Karnataka and Rs. 63 in Jharkhand and the average price of the egg is Rs. 3.6 in Karnataka and Rs. 2.98 in Jharkhand. It is reported that annual cost for backyard poultry is Rs. 4733 in Karnataka and Rs. 771 in Jharkhand, and the average revenue earned was Rs. 17,348 in Karnataka and Rs. 12,573 in Jharkhand with an average net income of Rs. 12,614 in Karnataka and Rs. 11,801 in Jharkhand.

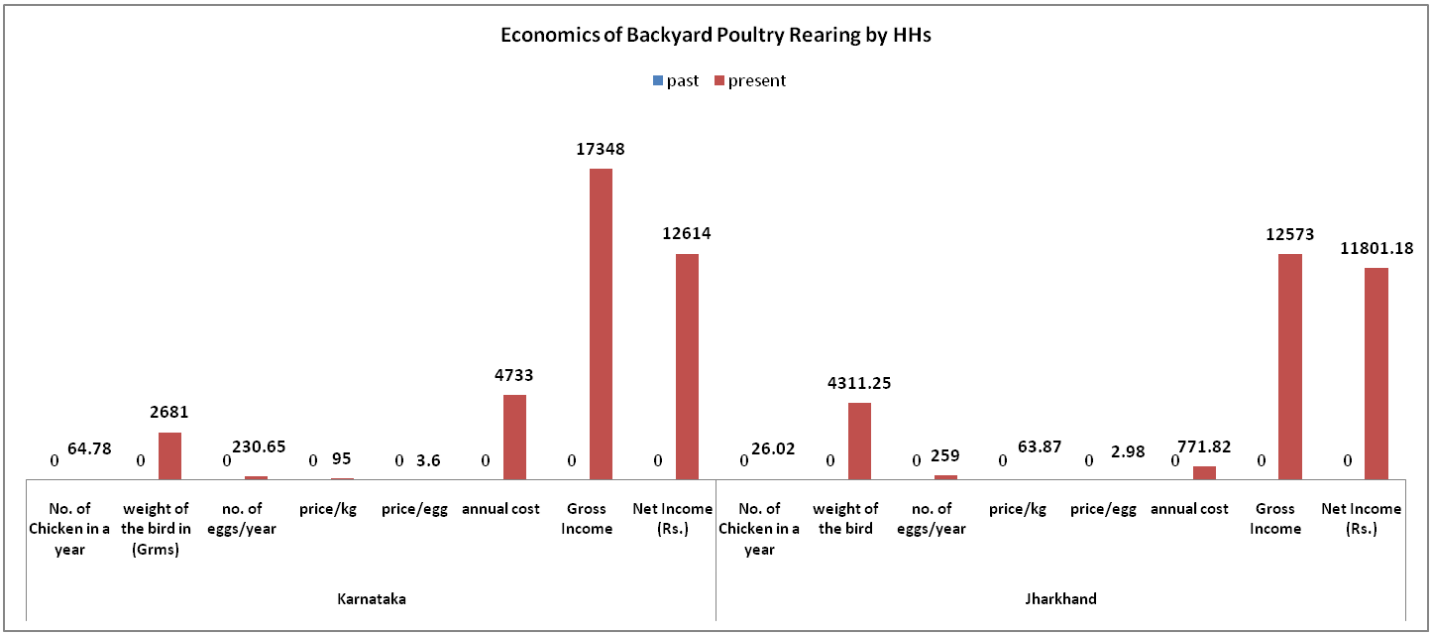


Figure 3.2.77: Economics of Backyard Poultry Rearing by HHs

It is disclosed from the income utilisation pattern of the respondents that there is a great variation in the respondents' present and past utilisation patterns. In Karnataka, the average proportion of income spent on clearance of debts decreased from 23% to 3% and the same is observed with expenditure on subsistence needs of a household with a decrease from 25% to 13% of total income. The expenditure spent on inputs also decreased from 23% to 14%. In contrary to this trend, the proportion of income spent on improvement of temporary assets increased from 8% to 9% and it increased from 3.5% to 15% in the case of permanent assets. The percentage of income spent on household necessities like education, health, and other wellbeing activities increased from 13% to 18% and that the amount saved for future also increased from 2.2% to 25%. In Jharkhand, there is a sharp decline in the percentage of income spent on clearance of debt from 26% to 0 and a relative increase is observed in savings from 0% to 33%. The proportion of income spent on household subsistence needs declined from 35% to 16%. It has appeared that respondents have focused on to improve temporary and permanent assets. The share of income spent on temporary assets improvement increased from 2.2% to 7.8% and for permanents assets, it increased from 2% to 10.5. The income spent on household necessities also increased from 11.5% to 16.9%.

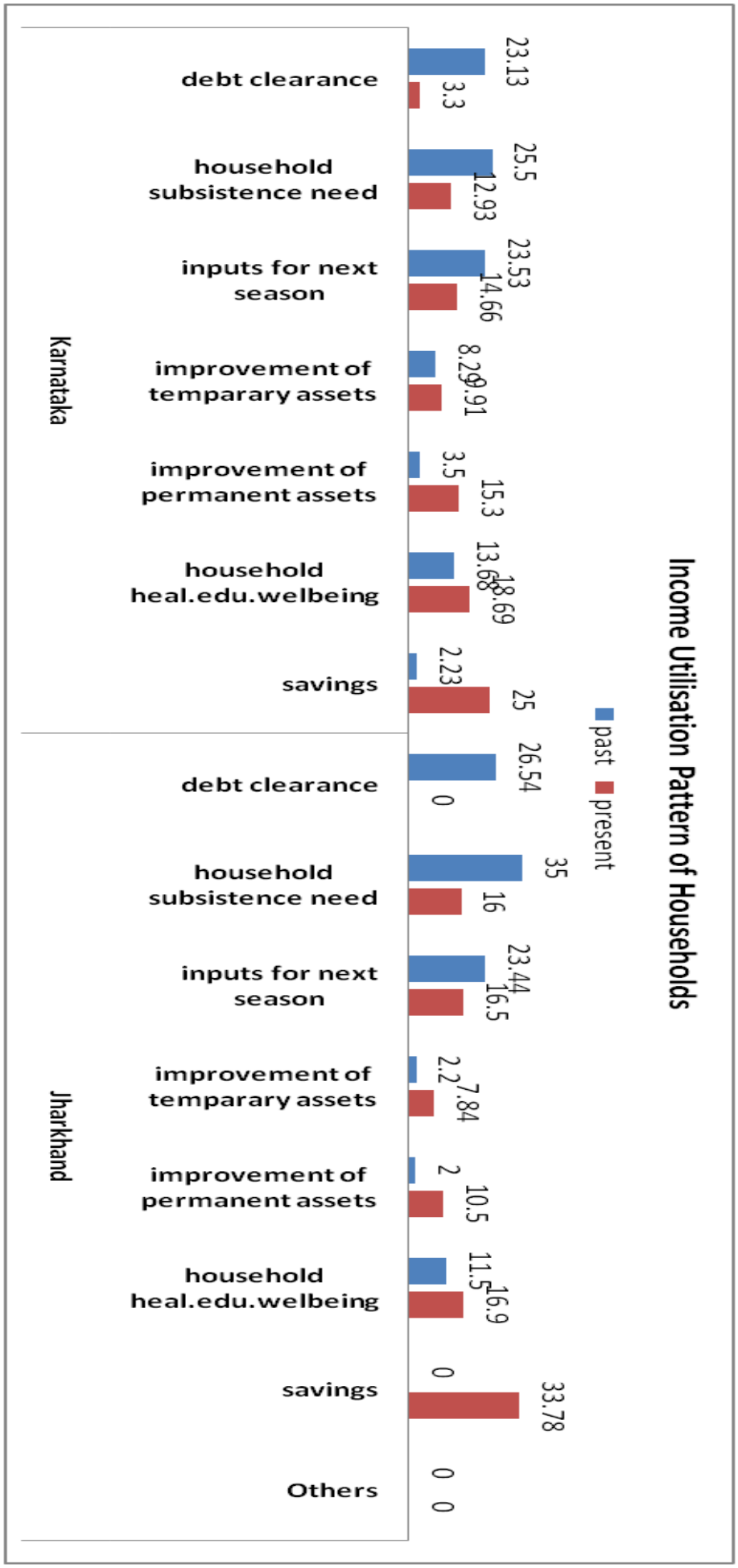


Figure 3.2.78: Income Utilisation Pattern of Household

It is found that the average annual working days for males increased from 158 to 278, whereas in the case of females, it increased from 163 to 292 in Karnataka. In Jharkhand, the average annual working days for the male respondents also increased from 137 to 216 and female working days increased from 166 to 345.

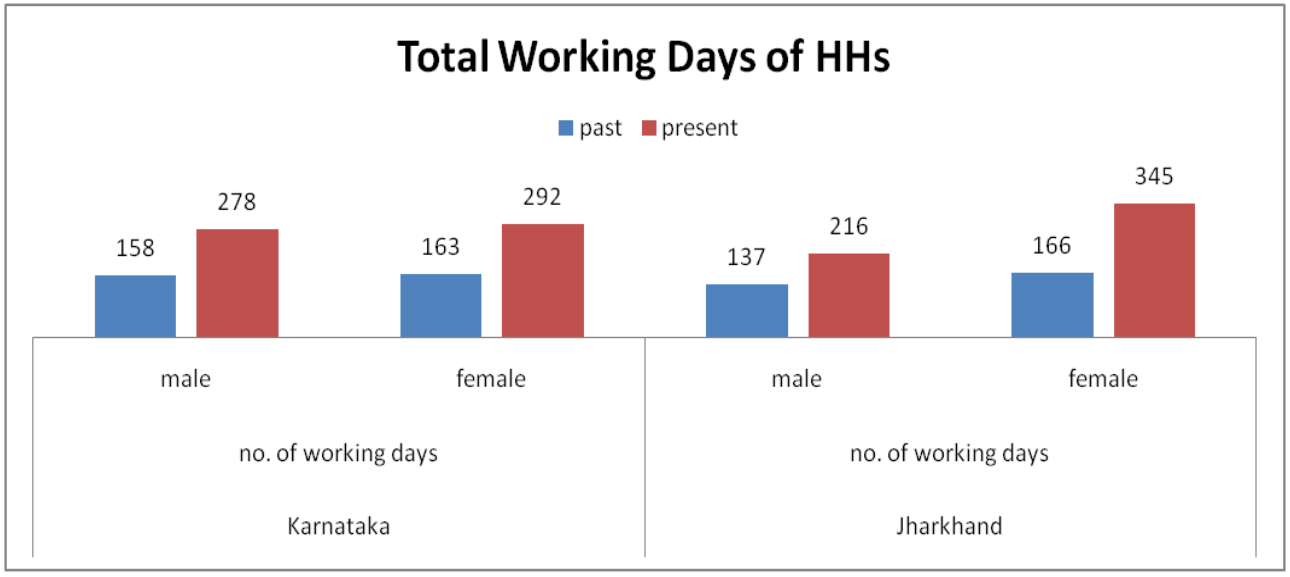


Figure 3.2.79 Total Working Days of HHs

The working days of the sample respondents were varyingly distributed across various activities of livelihood. It is found that in Karnataka, the agricultural working days of the male increased from 84 to 195 and the female working days in this activity also increased from 89 to 213. In non-agricultural activities, the working days of males decreased from 80 to 61 and working days of females increased from 18 to 54. On average, the male and female respondents in Karnataka worked for 25 and 26 days in MGNREGS, respectively. In Jharkhand, the agricultural working days of males increased from 75 to 166 and working days of females increased from 123 to 170. In non-agricultural activities, the working days of males decreased from 58 to 10 and for the females, it has decreased from 37 to 9 days. The male and female respondents worked in MGNREGS for 41 and 33 days, respectively.

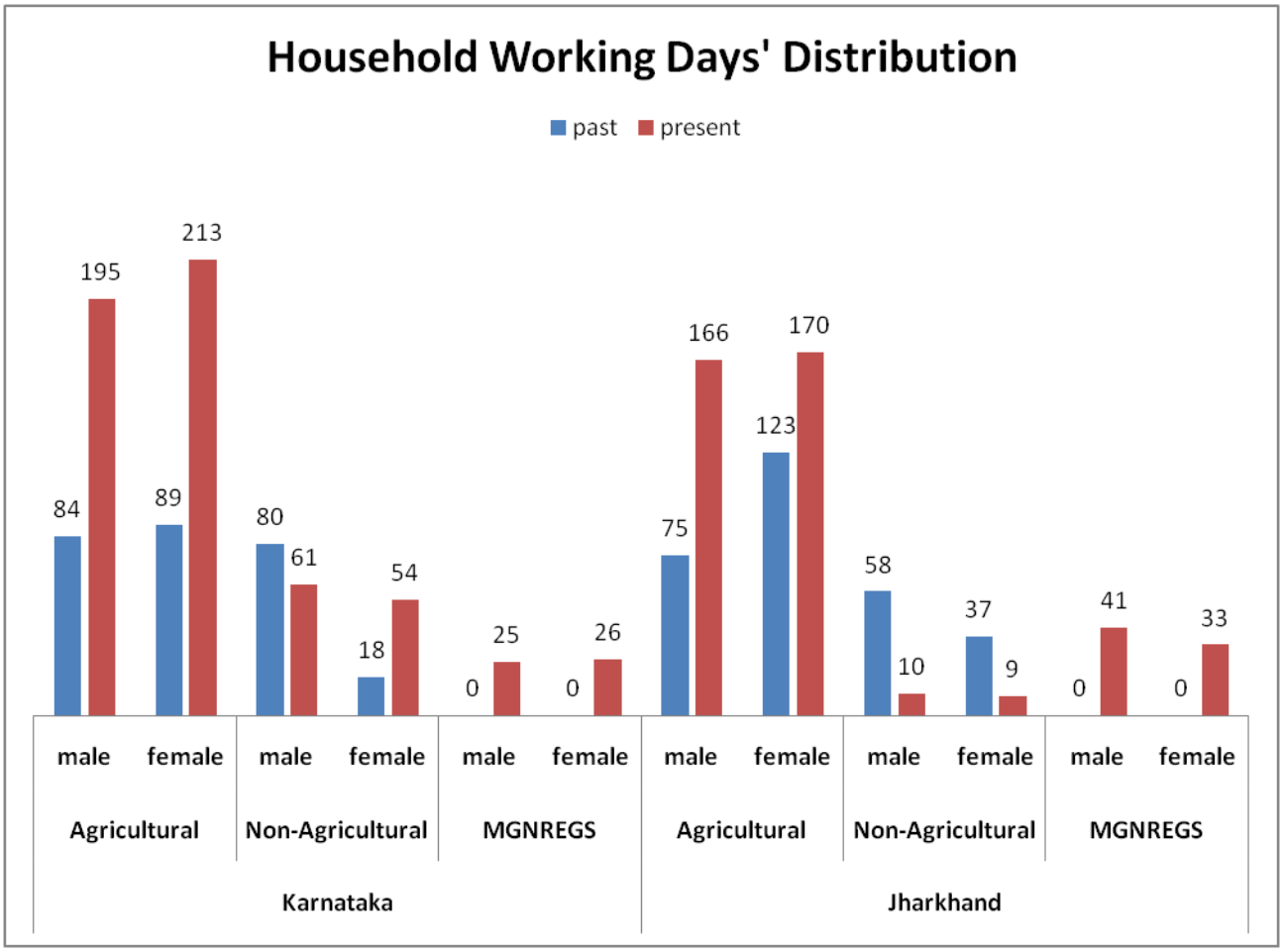


Figure 3.2.80: Household Working Days' Distribution

A great variation is observed in the wage pattern across various activities of livelihood. It is reported by the sample respondents in the Karnataka that the average wage for males in farm activities increased from Rs. 94 to Rs. 227 and for the females, it increased from Rs. 91 to Rs. 222. In non-farm activities, the wage for males increased from 134 to 304 and for females, it increased from 132 to 292. On average, the male respondents and female respondents in Karnataka secured Rs. 203 wage in MGNREGS works. In Jharkhand, the average farm wage for the males increased from 89 to 158 and for female, it increased from 64 to 125. The average non-farm wage for males has also increased from 104 to 206 and for females, it increased from 85 to 182. The average wage for male and female in MGNREGS increased from 169 to 166.

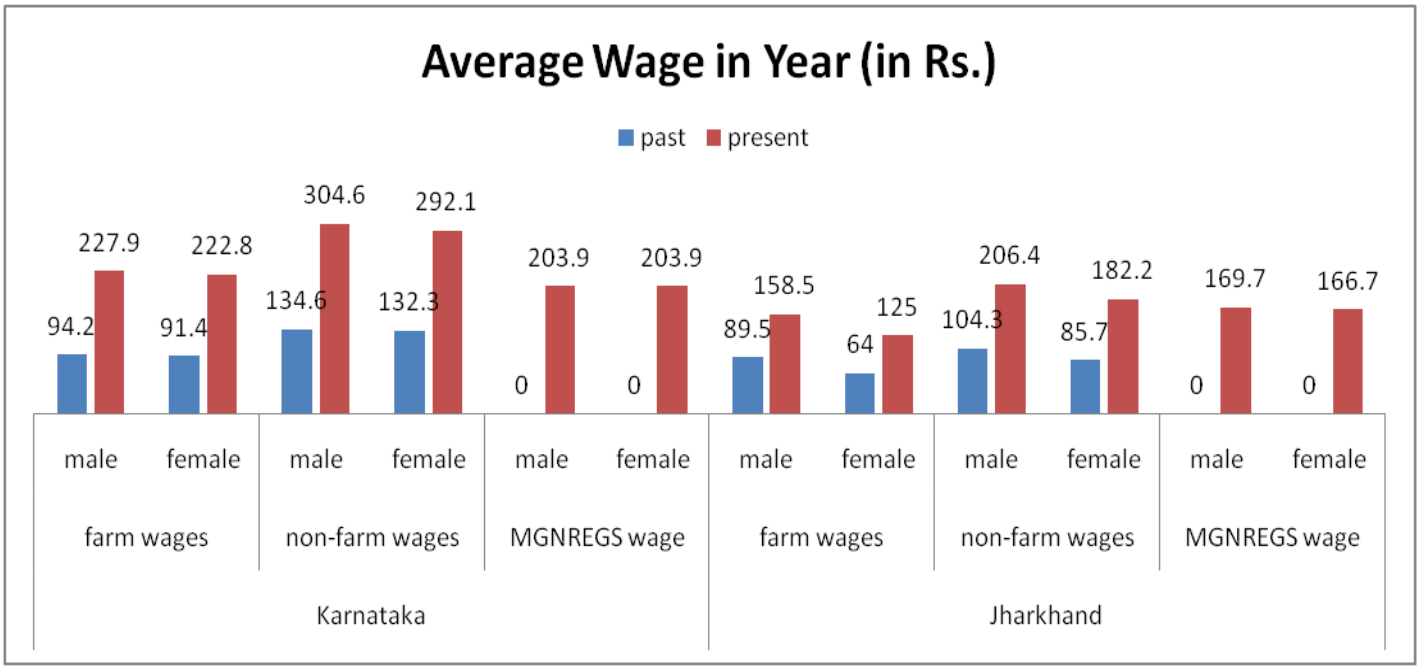


Figure 3.2.81: Average Wage in Year (in Rs.)

Over the years, there has been a decrease in the number of migrated days in both Karnataka and Jharkhand States. It is reported that the number of migration days in Karnataka decreased from 53.43 to 16.16. The proportion of income allocated for debt clearances also decreased from 23 % to 0%. In Jharkhand, no. of migrated days decreased from 54 to 18 and the amount incurred to clear debt decreased from 23% to 0%.

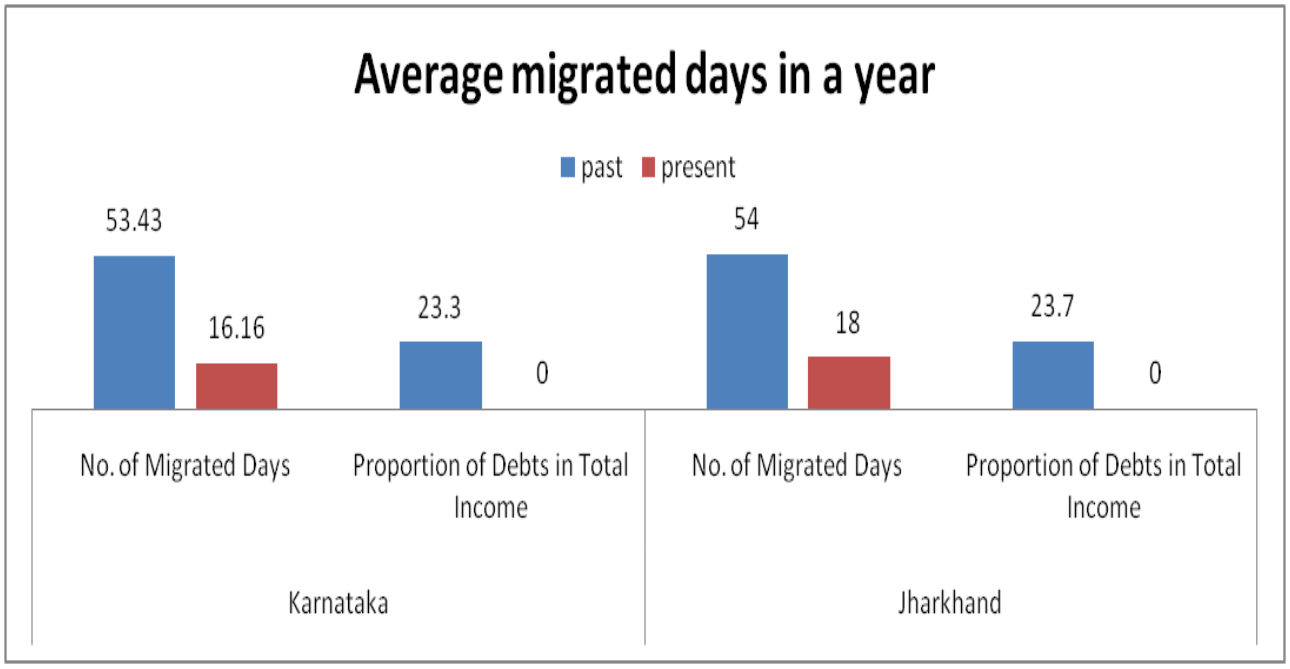


Figure 3.2.82: Average No. of Migrated Days in a Year

Over the years, the respondents' access to health and other sanitation facilities has improved. In Karnataka, previously majority of the sample respondents perceived that the accessing such facilities is difficult and currently there is a sea of change in respondents' perceptions. Currently, majority of the respondents reported easy access to such facilities. In Jharkhand, all the respondents perceived that the accessibility to health and sanitation facilities was difficult in previous days. Currently, majority of them perceived their access to such facilities as easy and very easy.

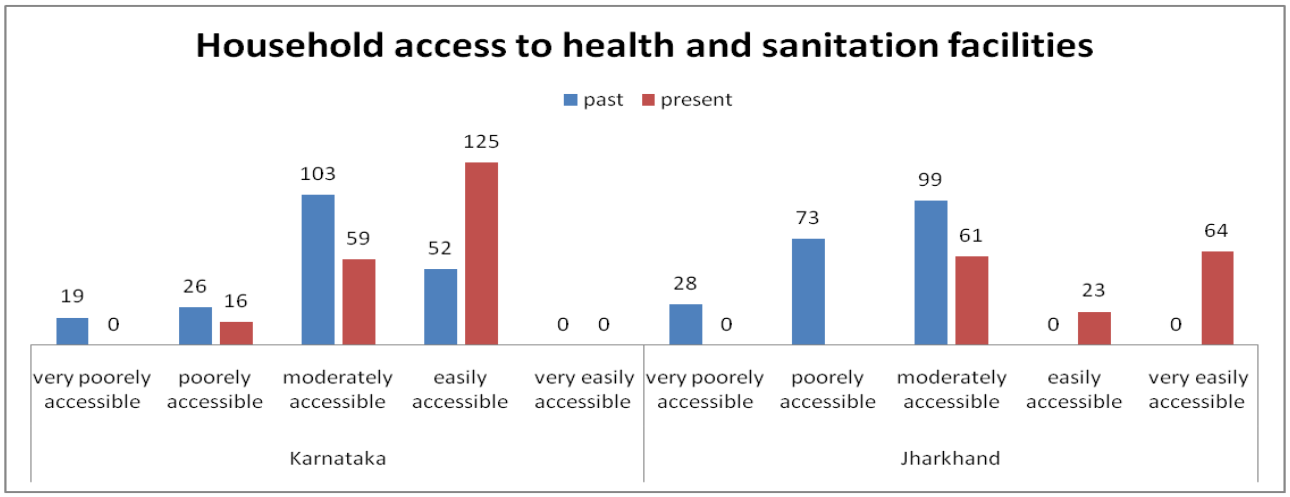


Figure 3.2.83: Household Access to Health and Sanitation Facilities

Majority of the sample respondents in Karnataka perceived that their access to banking facilities was moderate and over the years, their perception over such facilities has changed. Currently, majority of them reported that they have easy access to such facilities. In Jharkhand, majority of the respondents perceived their access to banking facility as difficult in previous days. Over the years, the respondents' access to such facilities has improved and majority of them currently perceived their access to such facilities as easy and very easy.

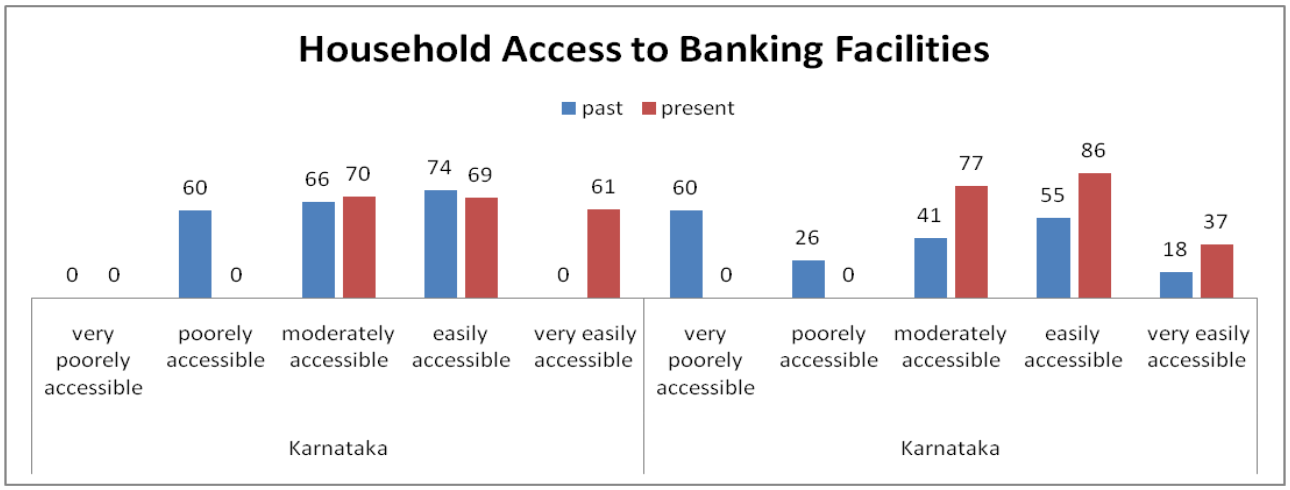


Figure 3.2.84: Household Access to Banking Facilities

The household access to anganwadi services has greatly improved over time. In Karnataka, majority of the respondents perceived this access as difficult to moderate in previous times and now they report that they have easy access to such centres. In Jharkhand, majority of the sample respondents stated that their access to anganwadi centre was difficult in previous times. Over the years, their access to such centres has improved greatly and now they perceived it as easy.

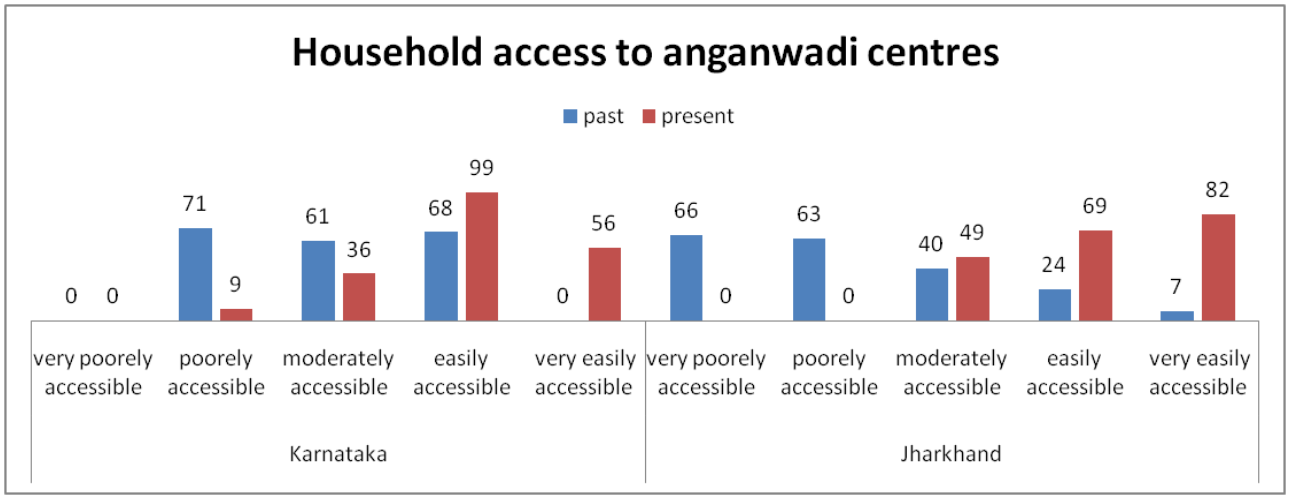


Figure 3.2.85: Household Access to Anganwadi Centres

It is observed that the respondents' access to the ASHA scheme has greatly improved over the period. Majority of the Karnataka sample reported that their access to the said scheme was very difficult and over the time, it has become easy to avail such a scheme. In Jharkhand, there is a clear turn in respondents' perception towards their access to ASHA scheme. Earlier, they had perceived that the access to ASHA scheme is very difficult and now they expressed that the access to the said scheme is easy.

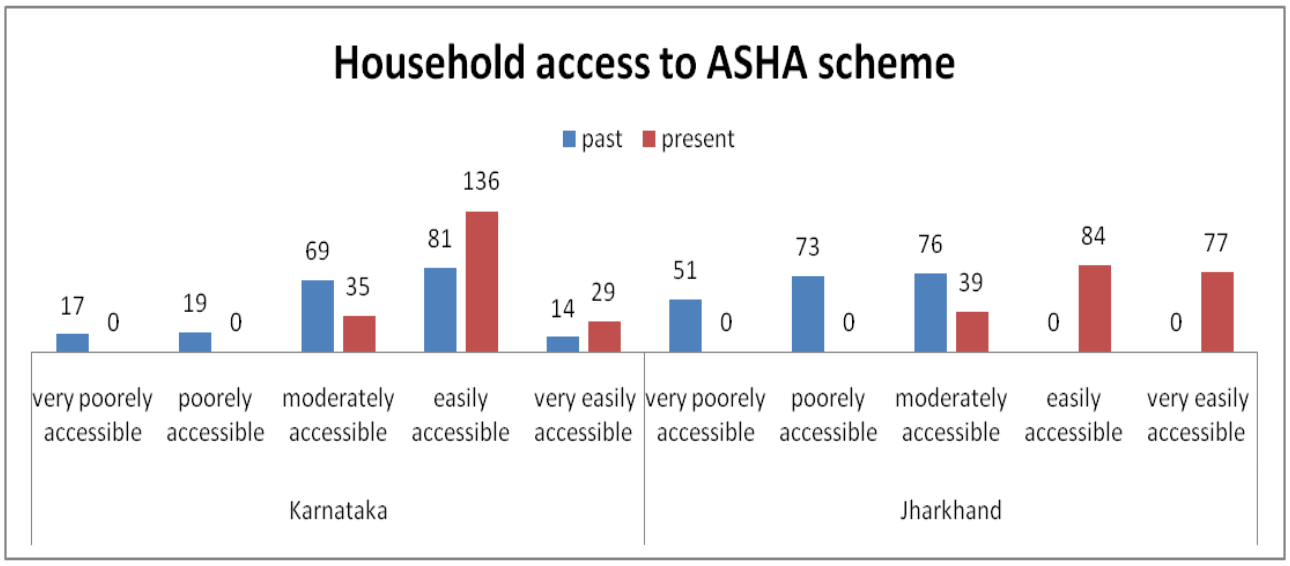


Figure 3.2.86: Household Access to ASHA Scheme

It is observed that the respondents from Karnataka and Jharkhand faced very much difficulty in accessing farmers' facilities and over the time the access to such facilities has become easy.

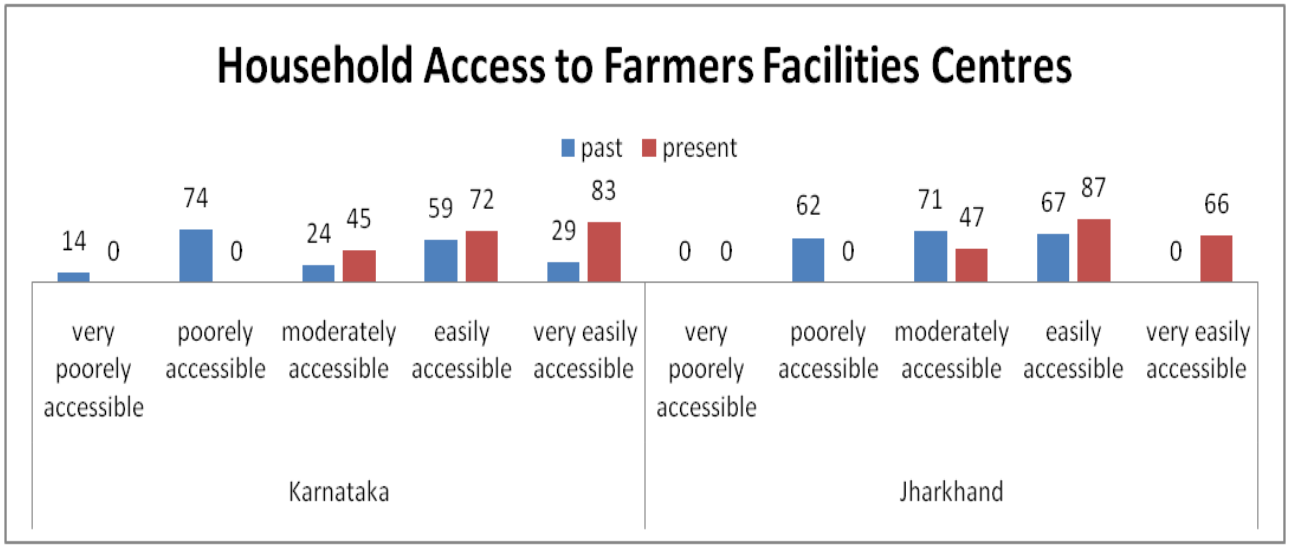


Figure 3.2.87: Household Access to Farmers Facilities Centres

As similar to other accesses, the access to soil health card by the respondents has also greatly improved over the time. Majority of the respondents in Karnataka and Jharkhand expressed that their access to soil health card was very difficult in the past and later it has become easy over the time.

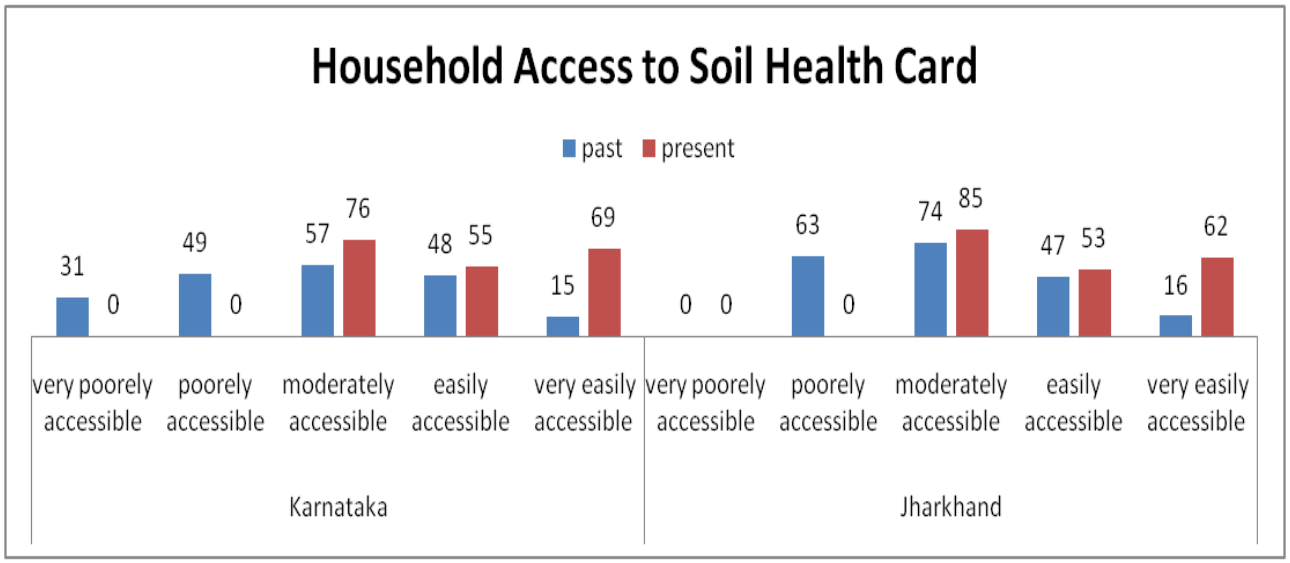


Figure 3.2.88: Household Access to Soil Health Cards

Majority of the respondents of Karnataka State perceived their access to MGNREGS works as easy, whereas, in Jharkhand, the majority of them perceived it as moderate access.

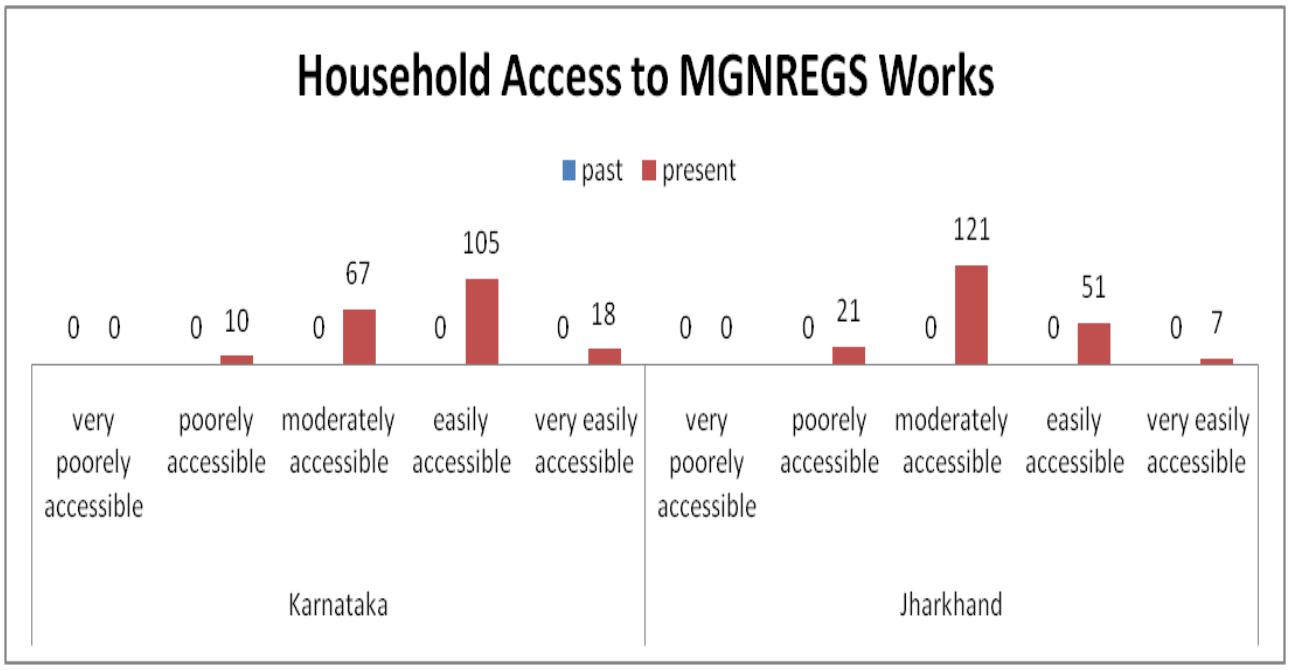


Figure 3.2.89: Household Access to MGNREGS Works

It is observed that the access to insurance facilities by the Karnataka and Jharkhand respondents was very difficult and over the years, it has become easily accessible.

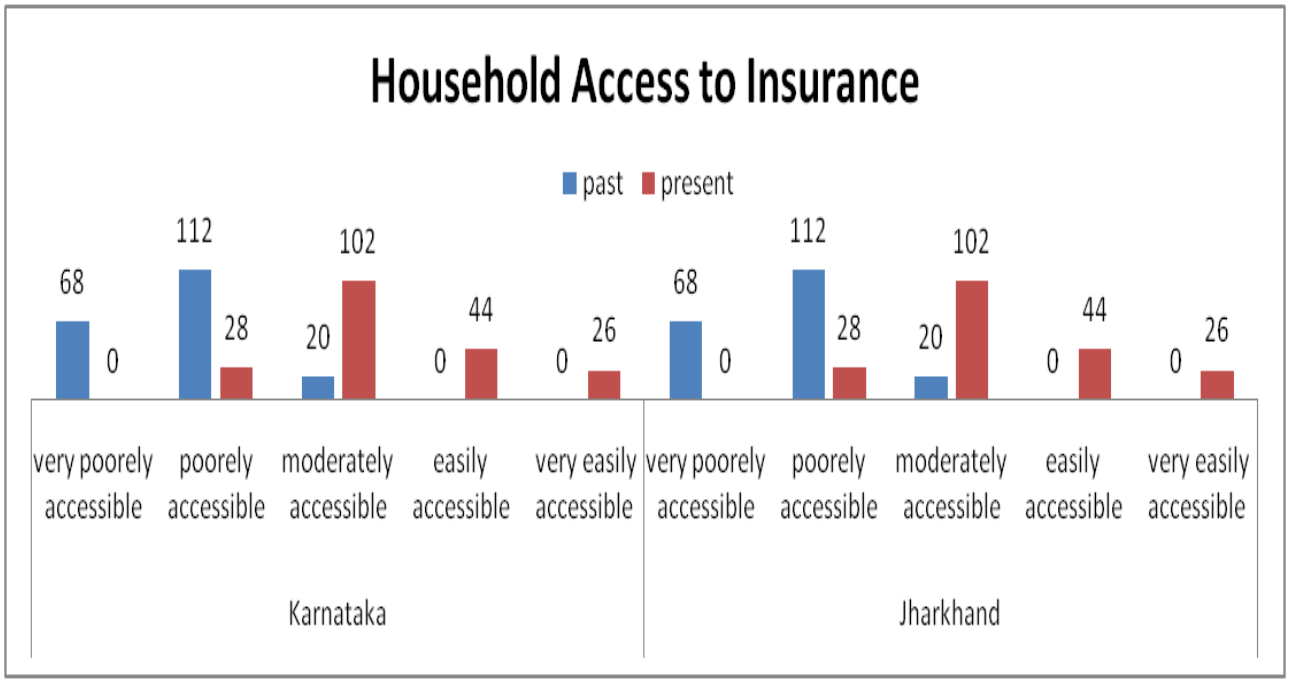


Figure 3.2.90: Household Access to Insurance

It is also observed that the access to veterinary services by the respondents in Karnataka and Jharkhand increased over the time. They perceived that their access to such service was difficult in the past, adding that they can easily to veterinary services at present.

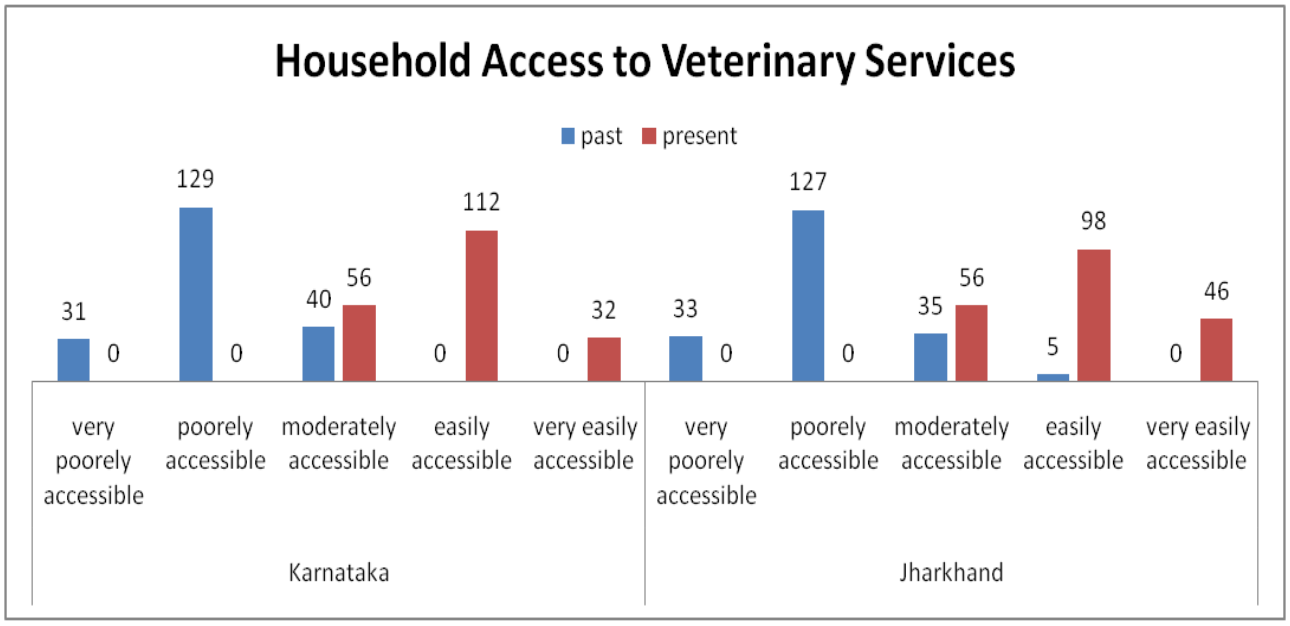


Figure 3.2.91: Household Access to Veterinary Services

3.3 Inferential Analysis:

The primary data collected in the study was analysed using the Pearson Correlation technique to explore the relationship between various variables of the research concerned. For correlation analysis, we have considered 12 variables that represent various aspects of the respondents' livelihood. The list of variables of the correlation analysis and their respective coding and measurement are given below.

Table: 3.3.1 Variable Coding

S. No.	Variable	Coding
1	Livelihood Competency Index	**LCI**
2	Social Capital Index	**SCI**
3	Adoption Index	**AI**
4	Agriculture Income Variation	**AIV**
5	Dairy Income Variation	**DIV**
6	Small Ruminants Income Variation	**SRIV**
7	Income Variation in Backyard Poultry	**IVBP**

S. No.	Variable	Coding
8	Working Days Variation	**WDV**
9	Farm Wage Variation	**FWV**
10	Non-Farm Wage Variation	**NFWV**
11	Variation in Migration	**VM**
12	Access to Developmental Facilities	**ADF**

The variable ***'Livelihood Competency Index'*** is measured through the ratio scale by developing an index value. For the calculation of the index, we have developed a mathematical formula as presented in the following table. It interpreted that the higher the index value the higher the competency level of the livelihood.

Table 3.3.2: Livelihood Competency Index

1	Livelihood Competency Index **(LCI)**	(TANI≥ANI/TNIF)+ ((RHLSV/APLM)/THLSV)/RTHCSV) + (FCELXTFCL)/RCVIL)+ TOHL/ ROHL+(ALSS/TLSS)XRIHLP

TANI≥ANI = Triennium Average Net Income in comparison with Average Net Income
TNIF= Trend of Net Income Flow
RHLSV= Household Perceived Social Value
APLM= Social Recognition for Household Livelihood
THLSV = Trend of social recognition towards household livelihood
RTHCSV = Household perceived Social Value on livelihood
FCEL = Frequency of Climatic Challenges on livelihood
TFCL = Trend of Frequency of Climatic challenges of livelihood
RCVIL = Rating on Household Livelihood Climatic Vulnerability
TOHL = Trend of Household Obsolescence in the past
ROHL = Rating on Obsoleteness of Household livelihood
ALSS = Access to Livelihood Support Schemes
TLSS = Trend of Household livelihood supporting schemes
RIHLP = Rating on Relative Importance of Livelihood in Policymaking

The ***social capital index*** is developed by deriving an index value from the sub-component variables related to social capital development. Index values of the variables are calculated through the following formula. It is interpreted that the higher the index value the higher the social capital generated for the households.

Table: 3.3.3 Social Capital Index

2	**Social Capital Index (SCI)**	**(OVD X REV)+(NoNi X RIN-BE)+ (OTD X RT X RICTD)**
OVD = Overall Duration of Exposure Visits REV = Perception on Utility of Exposure visits No Ni = Networking Ability of the household RINBE = Perception on Utility of Institutional Awareness OTD = Overall Duration of the Training RT = Perception on utility of the training RICTD = Perception on Utility of ICT Demonstration		

The ***adoption index*** of the individual is obtained as the product of the number of adopted practices by a household and the utility of the adopted practices on livelihood.

Table: 3.3.4 Adoption Index

3	Adoption Index **(AI)**	NCLPXRUAPL
NCLP = The number of adopted practices by a household RUAPL = Utility of the adopted practices on livelihood		

The other variable like 'Agriculture Income Variation' (AIV), Dairy Income Variation (DIV), Small Ruminants Income Variation (SRIV), Income Variation in Backyard Poultry (IVBP), Working Days Variation (WDV), Farm Wage Variation (FWV), Non-Farm Wage Variation (NFWV) and Variation in Migration (VM) are measure as the difference of their respective values in before and after the period from capacity building training.

Access to ***Developmental Facilities Index*** **(ADFI)** is developed by comparing the status of the respondents' access to various facilities and services related to their livelihood in prior and post capacity building periods.

Table: 3.3.5: Access to Developmental Facilities Index (ADFI)

12	Access to Developmental Facilities Index **(ADFI)**	Pre-Post Access Variation of health and sanitation + bank and other facilities + anganwadi and other welfare facilities + ASHA scheme + farmers facilities + soil health card + insurance + veterinary services

Table 3.3.6: Correlation Matrix of Karnataka Study Villages

	LC	SCI	AI	AIV	DIV	SRIV	IVBP	WDV	FWV	NFWV	VM	ADFI
LC	1											
SCI	0.6594	1										
AI	0.7696	0.5902	1									
AIV	0.6539	0.4604	0.8175	1								
DIV	0.6538	0.5226	0.7859	0.5708	1							
SRIV	0.6336	0.4116	0.7006	0.5083	0.674	1						
IVBP	0.6901	0.5691	0.8348	0.6782	0.7151	0.6463	1					
WDV	0.5834	0.4404	0.7298	0.5672	0.6333	0.6659	0.6176	1				
FWV	0.5819	0.4373	0.7566	0.6854	0.505	0.4683	0.6381	0.2765	1			
NFWV	0.5705	0.4274	0.7666	0.6865	0.5125	0.514	0.6625	0.2687	0.8709	1		
VM	0.594	0.4541	0.8452	0.7624	0.5514	0.5079	0.7074	0.5671	0.7319	0.8012	1	
ADFI	0.5889	0.4472	0.7639	0.6347	0.5877	0.6151	0.7059	0.6977	0.5145	0.5831	0.6908	1

The values in the data represent the correlation coefficient value (r)
r (0.01-0.1) = Very Weak Correlation; r (0.1-0.3) = Weak Correlation;
r(0.3-0.5) = Moderate Correlation;r(0.5-0.7)= Strong Correlation;r(0.7-1.0)= Very Strong Correlation

The analysis of the correlation coefficient values in the correlation matrix of Karnataka State reveals that the variable ***'livelihood competency'*** is in a very strong relationship with the variable 'Adoption Index' and it also has a strong relationship with all other variables of the study. It is found that the variable ***'Social Capital Index'*** (SCI) is in a strong relationship with Livelihood Competency Index, Adoption Index, Dairy Income Variation and Income Variation from Backyard Poultry. The SCI variable shows a moderate relationship with Agriculture Income Variation, Small Ruminants Income Variation, Working Days Variation, Farm Wage Variation, Non-Farm Wage Variation, Variation in Migration and Access to Developmental Facilities Index variables. Interestingly, the variable ***Adoption Index*** is in a very strong relationship with all the variables of the study, except with Social Capital Index variable with which it has a strong positive relationship.

The variable '***Agriculture Income Variation'*** shows a strong relationship with all the variables except with Social Capital Index (SCI) and Adoption Index (AI). The variable 'Agriculture Income Variation' is in moderate relationship with Social Capital Index (SCI) and with the variable 'Adoption Index' (AI) it has a very strong relationship. The variable 'Dairy Income Variation' (DIV) has a very strong positive relationship with Adoption Index variable and Income Variation from Backyard Poultry and has a strong relationship with all other variables of the study. The variable 'Small Ruminants Income Variation' (SRIV) has shown a moderate relationship with the variables like SCI and Farm Wage Variation (FWV) and very strong relation with Adoption Index and maintained a strong relationship with all other variables of the study. The variable 'Income Variation from Backyard Poultry' (IVBP) has a very strong relationship with AI, DIV, Variation in Migration (VM) and Access to Developmental Facilities Index (ADFI) and it has maintained a strong relationship with all other variables of the study. The variable 'Working Days Variation' (WDV) shown a moderate relationship with SCI, FWV and Non-Farm Wage Variation (NFWV) and maintained a very strong relationship with AI and also has a strong relationship with all other variables of the study.

The variable 'Farm Wage Variation' has a very strong relationship with the variables like AI, NFWV and VM and also maintained a moderate relationship with SCI, SRIV and WDV and shown a strong relationship with all other variables of the study. The variable 'Non-Farm Wage Variation' (NFWV) has a strong relationship with AI, FWV and VM and

maintained a moderate relationship with SCI and WDV and maintained a strong relationship with all other variables of the study. The variable 'Variation in Migration' has a very strong relationship with AI, AIV, IVBP, FWV and NFWV and also shown a moderate relationship with SCI and involved in a strong relationship with all other variables of the study. The variable 'Access to Developmental Facilities Index' (ADFI) has a very strong relationship with only two variables such as AI and IVBP and maintained a moderate relationship with SCI and shown a strong relationship with all other variables of the study.

Table 3.3.7: Correlation Matrix of the Jharkhand Study Villages

	LC	SCI	AI	AIV	DIV	SRIV	IVBP	WDV	FWV	NFWV	VM	AD-FI
LC	1											
SCI	0.6468	1										
AI	0.8462	0.8963	1									
AIV	0.5937	0.3684	0.7795	1								
DIV	0.7756	0.6435	0.8563	0.6622	1							
SRIV	0.6038	0.4892	0.8542	0.8067	0.6482	1						
IVBP	0.6957	0.7862	0.7356	0.4389	0.8621	0.6451	1					
WDV	0.6638	0.4648	0.8462	0.6473	0.6338	0.7346	0.8431	1				
FWV	0.8592	0.4345	0.8946	0.6987	0.8156	0.4867	0.6959	0.3567	1			
NFWV	0.6305	0.6735	0.8324	0.6654	0.4581	0.8411	0.6421	0.4758	0.6812	1		
VM	0.6451	0.4491	0.8845	0.7983	0.4623	0.6989	0.7758	0.6648	0.8843	0.8906	1	
ADFI	0.7998	0.4943	0.7491	0.6445	0.8369	0.4328	0.7348	0.7995	0.6951	0.7563	0.7418	1

The values in the data represent the correlation coefficient value (r)

r (0.01-0.1) = Very Weak Correlation;r (0.1-0.3) = Weak Correlation;

r(0.3-0.5) = Moderate Correlation;r(0.5-0.7)= Strong Correlation;r(0.7-1.0)= Very Strong Correlation

The correlation coefficient analysis in the correlation matrix of Jharkhand State reveals that the variable '***Livelihood Competency'*** has a very strong relationship with AI, DIV, FWV and ADFI and maintained a strong relationship with all other variables of the study. The variable '***Social Competency Index'*** has a very strong relationship with AI, IVBP and NFWV and has a strong relationship with DIV and shown a moderate relationship with all other variables of the study. As similar to Karnataka, in Jharkhand also the variable '***Adoption Index'*** shows a very strong relationship with all the variables of the study. The variable '***Agricultural income Variation'*** has a very strong relationship with AI, SRIV and VM and shown moderate relationship with IVBP and maintained a strong relationship with all other variables of the study. The variable ***'Dairy Income Variation'*** has a very strong relationship with AI, LC, IVBP, FWV and ADFI and has a moderate correlation with NFWV and VM and maintained a strong relationship with other variables of the study. The variable 'Small Ruminants Income Variation' has a very strong relationship with AI, AIV and NFWV and has a moderate relationship with SCI, FWV and ADFI and has a strong relationship with all other variables of the study.

The variable '***Income Variation from Backyard Poultry'*** has a very strong relationship with AI, SCI, DIV, WDV, VM and AFDI and has a moderate relationship with AIV and maintained a strong relationship with other variables of the study. The variable 'Working Days Variation' has a very strong relationship with AI, IVBP and ADFI and has a moderate relationship with SCI, FWV and NFWV and has a strong relationship with other variables of the study. The variable 'Farm Wage Variation' has a very strong relationship with AI, LC, DIV and VM and has a moderate relationship with SCI, SRIV and WDV and maintained a strong relationship with other variables of the study. The variables 'Non-Farm Wage Variation' has a very strong relationship with AI, SCI, SRIV and VM and has a moderate relationship with DIV and WDV and show a strong relationship with other variables of the study. The variable 'Variation in Migration' has a very strong relationship with AI, AIV, IVBP, FWV and NFWV and moderate relationship with SCI and DIV and has a strong relationship with all other variables of the study. The variable 'Access to Developmental Facilities Index' has a very strong relationship with LC, AI, DIV, IVBP and WDV and has a moderate relationship with SCI and SRIV and show a strong relationship with other variables of the study.

Table 3.3.8: Combined Correlation Matrix of Study Villages in Karnataka and Jharkhand

	LC	SCI	AI	AIV	DIV	SRIV	IVBP	WDV	FWV	NFWV	VM	ADFI
LC	1											
LC	1											
SCI	0.6594	1										
SCI	0.6468	1										
AI	0.7696	0.5902	1									
AI	0.8462	0.8963	1									
AIV	0.6539	0.4604	0.8175	1								
AIV	0.5937	0.3684	0.7795	1								
DIV	0.6538	0.5226	0.7859	0.5708	1							
DIV	0.7756	0.6435	0.8563	0.6622	1							
SRIV	0.6336	0.4116	0.7006	0.5083	0.674	1						
SRIV	0.6038	0.4892	0.8542	0.8067	0.6482	1						
IVBP	0.6901	0.5691	0.8348	0.6782	0.7151	0.6463	1					
IVBP	0.6957	0.7862	0.7356	0.4389	0.8621	0.6451	1					
WDV	0.5834	0.4404	0.7298	0.5672	0.6333	0.6659	0.6176	1				
WDV	0.6638	0.4648	0.8462	0.6473	0.6338	0.7346	0.8431	1				
FWV	0.5819	0.4373	0.7566	0.6854	0.505	0.4683	0.6381	0.2765	1			
FWV	0.8592	0.4345	0.8946	0.6987	0.8156	0.4867	0.6959	0.3567	1			
NFWV	0.5705	0.4274	0.7666	0.6865	0.5125	0.514	0.6625	0.2687	0.8709	1		
NFWV	0.6305	0.6735	0.8324	0.6654	0.4581	0.8411	0.6421	0.4758	0.6812	1		
VM	0.594	0.4541	0.8452	0.7624	0.5514	0.5079	0.7074	0.5671	0.7319	0.8012	1	
VM	0.6451	0.4491	0.8845	0.7983	0.4623	0.6989	0.7758	0.6648	0.8843	0.8906	1	
ADFI	0.5889	0.4472	0.7639	0.6347	0.5877	0.6151	0.7059	0.6977	0.5145	0.5831	0.6908	1
ADFI	0.7998	0.4943	0.7491	0.6445	0.8369	0.4328	0.7348	0.7995	0.6951	0.7563	0.7418	1

The values in the data represent the correlation coefficient value (r)

r (0.1-0.3) = Very Weak Correlation;

r(0.3-0.5) = Moderate Correlation(0.5-0.7)= Strong Correlation;r(0.7-1.0)= Very Strong Correlation

CHAPTER-4

CONCLUSIONS AND POLICY IMPLICATIONS

The promotion of sustainable livelihoods practices under Mahila Kisan Sashaktikaran Pariyojana (MKSP) envisaged mostly empowering women farmers in governance, management and financial inclusiveness to sustain and improve their agriculture-based livelihoods by establishing efficient local resources use in agriculture gaining more control over the production, resources and managing support systems. The benefits were multifold. The impacts on sustainable livelihoods practices were reduction in farm and family expenses, relying on local natural resources, reduction in the financial cost with financial inclusion, creation of multiple and supplementary farm activities integrating multiple cropping, livestock's which ensures fairly monthly income stream and high net profit margin through value addition. These aspects were keenly observed in our two sample States. Our study findings revealed diverse results through farm-based sustainable livelihoods practices in eight sample villages of Jharkhand and Karnataka.

- The livelihood options for the households in study villages expanded over the time. Earlier, majority of the households found their subsistence in labouring works and that trend has changed in recent years and currently, agriculture, horticulture and backyard poultry are the major livelihoods of the majority of the households in Jharkhand, whereas the backyard poultry, horticulture and small ruminant rearing are the major livelihoods for households in Karnataka villages.

- Prior to the capacity building activities, the revenues and income levels of the households were showing a declining trend and are lower than the long-period average in preceding years. Majority of the sample respondents stated that the unproductive agriculture land and the lack of scope for the agroforestry system were the major reasons for the dwindling revenues and income of the households.

- The households in the study villages of Karnataka and Jharkhand States reported that they have been dwelling their lives with the same livelihood activity for about 23-28 years. It indicates the household's long-time experience with the current livelihood practices. Because of their persistence in pursuance

of their livelihood, it has been duly recognised by society. Majority of them also perceived their livelihood's relative social value with a higher value. The respondents of the study also highlight that despite the due recognition by the society, over the years there has been a decreasing trend in terms of social recognition toward their livelihood. And that change rate of declining trend is very high over the years.

- The lack of access to resources, lack of political power, beliefs and customs of households, conflicts and building stock and age were the major reasons that cause such a decline in social value towards households livelihoods.

- The household livelihood has been vulnerable majorly to rising temperatures and changing rainfall intensity. Their livelihood activities have been regularly suffering from these climatic extremes and the occurrence of such events in recent times shows an increasing trend. Majority of the respondents perceived that their livelihood vulnerability to climatic extremes is at higher levels. They believed that the fluctuations in crop production and land degradation are the major reasons for the increasing vulnerability levels.

- The means of discharging livelihood operations have been replaced by other methods and technologies. Majority of the respondents stated that 3-4 of their livelihood process have replaced with other methods or technologies. The replacement process represents either modernisation of the livelihood processes or traditionalisation of livelihood process based on the nature of the case. They perceived that that replacement has led to the obsolescence of their livelihood increases their vulnerability. The intensity of the livelihood obsolescence was at low levels in Karnataka and was at higher levels in Jharkhand. However, all there has been an increasing trend in the obsolescence rate of household livelihoods over the years. Majority of the respondents believed that the depletion of resources, lack of access to scientific knowledge and lack of access to markets are the major causes in addition to other causes like indebtedness and non-availability of resources for the increase in obsolescence trend.

- The respondents of the study opined that their livelihood has been excluded while implementing the developmental policies and there were not accessed

much with livelihood supporting scheme that is being declined in number over the years. They believed that lack of partnership between societies and government institutions, lack of strong social capital, lack of access to financial services, lack of diversification of livelihood and lack of digitalised dissemination of information are the major causes for such declining trend. Majority of the respondents thought that their livelihood was given low importance by the policymakers while making development framework.

- Households of the study villages were taken to exposure visits for learning livelihood improvement activities like organic agricultural practices, progressive farmers farming methods, methods in farmer's school and the technologies of demonstration platforms. Majority of the farmers participated in up to three exposure visits that are majorly facilitated by both NGOs and government partnership. The length of the exposure visits of majority of the Karnataka farmers was between six to eight days, whereas in Jharkhand, it was more than nine days. The utility of such exposure visits in improving household livelihood is at higher levels.

- Over the years, the household awareness over the institutions has been increased majorly through external assistance that was offered mainly by NGOs in Karnataka study villages and NGO-government partnership in Jharkhand.

- The enhanced institutional awareness enabled the respondents to develop networks with SHGs, NGOs, Banks, KVKs, government and other village organisations. Majority of the respondents have networked with four to five institutions for satisfying their financial, marketing, training and other general needs. The enhanced awareness has shown a higher utility level in improving the networking ability of the respondents.

- The skill profile of the households in study villages was improved over the years majorly due to external support offered by the NGOs in Karnataka and NGO-government partnership in Jharkhand through training and ICT information distribution. Majority of the sample respondents trained for more than 15 days on organic agricultural practices, seed treatment, FYM preparation, vegetable cultivation, animal rearing, marketing and technology usage. The imparted

training has shown higher levels of utility in improving livelihood standards of the households in study villages.

- The capacity of the household was improved by demonstrating various improved practices like organic farming, SRI cultivation, FYM preparation, intercropping, small ruminants rearing, livestock, backyard poultry, kitchen garden, azolla, lime water and cow urine. Majority of the households in sample villages were given demonstration over more than five practices that are discussed above through various methods like videos, wall painting, street paly, brochures and pamphlets. Majority of the respondents were given a demonstration of these aspects through four ICT methods. They opined that the ICT demonstration has shown greater utility in improving their livelihood.

- The household capacity building culminated through the adaptation of improved practices like integrated farming, crop diversification, an increase of livestock proportion, use of improved technology, cultivation of horticulture crops, organic farming in Karnataka state and adaptation of integrated farming, organic farming practices and usage of organic fertilizers and pesticides in Jharkhand state. There are more than two practices adopted by every household in study villages of both Karnataka and Jharkhand and most of the respondents believed that the adoption of improved practices has increased their standards of living. The adoption of improved practices has shown greater utility in improving household livelihood in study villages.

- The average size of the landholding that was cultivated by the majority of the household of Karnataka state ranges from 1.5 to 2.0 hectors and it has increased to over 2 hectors. On the other hand, the average size of the landholding that was cultivated by majority of the households of Jharkhand has improved from less than 1.5 hectors to up to 2 hectors.

- The cropping pattern of Karnataka study villages has shifted from staple food predominance to horticulture and commercial crops predominant pattern. Whereas the Jharkhand state has shown more or less similar cropping pattern over the period. In Jharkhand, the cultivation of rice, wheat and maize have declined and the consequent increase is observed in the cultivation of SRI paddy

and vegetable crops. It is evident from the study that there has been a significant improvement in the average area under vegetable crops in both states, it has increased from 0.4 Ha. to 1 Ha. in Karnataka and 0.7 Ha. to 1.1 Ha in Jharkhand.

- Over the period, as a result of the capacity building and improved agricultural practices, there has been an increase in average production. In Karnataka, the average production of major foodgrains like ragi, red gram, cowpea and horse gram was increased from 15.4 to 31 Quintal/Ha. Similarly, the average production of vegetables has also been increased from 10 to 41 Quintal/Ha. In Jharkhand, the average production of vegetables has shown a manifold increase from 17.5 to 86 Quintal/ Ha.

- The average cost of production has increased over the period and huge variation was observed in the cultivation of vegetable crops in Karnataka, and paddy and vegetable crops in Jharkhand. The cost of production for vegetable cultivation has increased from the Rs. 1550/Ha to 2447/Ha in the study villages of Karnataka, whereas in Jharkhand, the average cost of production for the cultivation of paddy increased from Rs. 40,000/Ha to Rs. 89,227/Ha. and for SRI paddy it increased from Rs.25,000/Ha. to Rs. 52,335/Ha. The cost of vegetable production in Jharkhand increased from Rs. 3500/Ha to Rs. 22,000/Ha.

- The average price for the produce has also been increased over the period but as to compensate for the increase in the cost of production. When compared with the Jharkhand, the household of Karnataka state has received higher levels of price for their produce. The significant price increase is observed for horticulture and vegetable crops in Karnataka and vegetable in Jharkhand state. Despite the higher level of prices, the households in Karnataka state have marketed relatively lesser quantities of produce than the Jharkhand households. Significant increase is observed in the marketed produce for the crops vegetable crops and mixed crops in Karnataka, whereas in Jharkhand, except in wheat all other crops have shown a relatively good increase in market quantities. The marketed quantity of vegetables in Jharkhand state has shown a several-fold increase.

- The households in Karnataka study villages have shown a higher level of household consumption of their produce when compared with the household consumption of Jharkhand respondents. Very significant improvement was observed in the household consumption of vegetable in both States.

- Household of the study villages was succeeded in leveraging their enhanced capacity and adaptation of improved practices by way of improving their income levels. The average gross income from various crops has been increased for all crops, a higher-level increase was observed in the case of horticulture crops in both States.

- The livelihood of households in study villages have been strengthened with the initiative of high yield milk animals. The practice of rearing milch animals is a new concept in the study villages of Jharkhand state. In the study villages of the Karnataka, the yield of milch animals increased from 5 to 15 ltr./day and the mulching days from 117 to 192 days/year. The net income increased from Rs. 1604 to Rs. 47,976 per annum. The annual net income from the milch animals is around Rs. 16,300 in Jharkhand.

- The exposure visits and demonstration sessions enabled the households of the study villages to rear small ruminants like sheep and goats to provide additional income to their subsistence. The household in Karnataka could earn an average net income of Rs. 18,240 per year and Jharkhand farmers could earn an average net income of Rs. 8900 per year.

- Rearing of backyard poultry has also shown significant improvement in household livelihoods. It adds an additional income of Rs. 12,600 for households in Karnataka and Rs. 11,800 for households in Jharkhand.

- A major portion of the income that was earned by the households in study villages spent primarily on the purchase of subsistence goods, procurement of inputs and debt clearance. An insignificant proportion of the income was incurred to build a permanent asset and very little amount or no amount was left for savings. With the adaptation of improved livelihood practices and increase in income level, a more significant amount of income is being spent on the

household health needs and creation of the permanent asset. On average, the maximum proportion of the household income, 25% in Karnataka and 34% in Jharkhand is being saved to meet future household needs.

- As a result of the capacity building efforts, the total number of household working days for both genders has been increased. The number of working days for the females and males has increased from 163 to 292 and 158 to 278, respectively, in the study villages of Karnataka. In Jharkhand villages, the number of working days for the females increased from 166 to 345 and for males, the working days increased from 137 to 216. Majority of the working days of the household have been spent on agricultural activities.

- The increase in the number of working days is also coupled with an increase in wages. In both States, the wage being received for the non-farm activities is higher than the farm wages and MGNREG wages. In Karnataka State, the average wage for male and female is increased from Rs. 90 to 220 for farming and from Rs. 130 to 300 for non-farm activities. In Jharkhand State, the average farm wage for the male is increased from Rs. 90 to 158 and Rs. 64 to 125 for female, the non-farm wages for the male is increased from Rs. 104 to 206, and Rs. 85 to 182 for female.

- The period of households' migration to other places for work has been declined significantly in both Karnataka and Jharkhand States. The average migration days of a household is declined from 53 to 16 in Karnataka and 54 to 18 in Jharkhand. There is a complete reduction in the proportion of income that has been spent to clear the debts of households in both States.

- The capacity building efforts and networking efforts have culminated in an increase in access to developmental benefits. Majority of the households in study villages of Karnataka and Jharkhand has shown improved access to health and sanitation facilities, banking facilities, anganwadi centres, ASHA scheme, farmer facilities, soil health card, insurance, veterinary services and MGNREGS works.

- In both Karnataka and Jharkhand study villages, the variable Adoption Index which shows the intensity of adoption of improved practices by household is

showing very strong positive correlation with the variables like Livelihood Competency Index, Social Capital Index, Agriculture Income Variation, Dairy Income Variation, Small Ruminants Income Variation, Income Variation in Backyard Poultry, Working Days Variation, Farm Wage Variation, Non-Farm Wage Variation, Variation in Migration and Access to Developmental Facilities. Whereas the variable Social Capital Index has shown a moderate positive correlation with all of the study variables except with Adaptation of Index, Dairy Income Variation, Income Variation in Backyard Poultry and Non-Farm Wage Variation.

Policy Implications

Based on the results discussed above, the study eventually has drawn the following policy implications for further efforts for the improvement and replication of farm-based sustainable livelihoods practices elsewhere in the country.

- ***Ensuring food and nutritional security for women and children:*** The family development plan processes through SHGs have helped to identify the food and nutrition requirements of the family and means of achieving it. The inbuilt package of practices such as kitchen garden, backyard poultry and rising various horticulture based fruit crops by households have yielded positive results. This has been achieved through modelling, training programmes, demonstrations on high crop intensity vegetable farms, organising women-specific campaigns for food and nutrition, general health awareness using the forums of the SHGs and FFS by PIAs in respective study areas.

- ***Soil and water health improvement***: Capacity development training of Community Resource Persons (CRPs) on trench cum bunding in slope area, contour farming, rainwater harvesting, soil health improvements, especially effective microorganisms, mulching, green manuring, and agronomic practices such as jeevamrutha, panchagavya, vermicompost, multi-cropping with crop rotation have helped to the farmers through effective digital dissemination of information by CRPs improved the fertility of soil as well as reducing the cost in terms of control of pest by using locally available indigenous pest management

practices. This has further stabilised the yield sustainably.

- ***Management and control of seeds:*** Training programmes for farmers, especially women farmers in varietal selection, seed production, seed conservation and seed bank management has made a major positive contribution to the successful maintenance of farm-based sustainable livelihoods practices in our study areas. The management and control of seed bank was achieved through the establishment of community seed bank one each at Gram Panchayats by PIAs in respective study areas. The seed bank was functioning on the principle of pay it forward basis.

- ***Mitigation of risk of exposure to hazardous farm practices***: Capacity building activities such as digital dissemination information mode on use of botanicals and pheromone traps, ecological approach to pest management using knowledge and skill-based practices to prevent insects from reaching damaging stages and damaging proportions by making the best use of local resources, natural processes and community action have contributed much to reduce risk, costs and thereby improvement in yield.

- ***Biodiversity enhancement***: The efforts initiated by PIAs in respective sample study areas through various capacity building measures on seed treatments, use of organic urea, crop diversification and establishment of plant nursery under supervision of village organisation (federation) to raise necessary planting materials for agroforestry, fodder and conservation of biodiversity have yielded positive results towards chemical-free natural friendly farm-based sustainable livelihoods practices.

- ***Use of indigenous knowledge***: It was observed that regular consultative curriculum development workshops with the community (SHGs / VOs) by PIAs to identify indigenous knowledge, best practices and put into practised rigorously in our two sample state villages.

- ***Suitability of technology to the local agroecology:*** Another effort made by PIA was facilitating the development of integrated farm enterprise planning (backyard poultry, kitchen garden, sheep and goat, piggery, fishery, apiculture and dairy). Extension services include suitable technology through

demonstration platforms were also exposed to the farmers from time to time.

- ***Resilience to climate change:*** Training on aerobic composting to reduce carbon emission, promotion of SRI to reduce methane emission and temperature tolerant agronomic practices were familiarised. Farmers were mobilised and in tuned to resilience to climate change impacts.

- ***Arrangements for post-project sustainability through governance and management***:

The following post-project arrangements were observed.

  - Develop the team of CRPs to support the grassroots level CBOs.
  - Training programmes in operations and management of appropriate farm machinery, community assets to meet the shortfall in manpower during critical periods of agriculture
  - Video and print documentation and dissemination of knowledge for replication

- ***Financial sustainability***

  - The financial sustainability was achieved through the training and other interactions designed having strong lines of messaging on self -help to orient and persuade the SHG members to contribute equity to their CBOs for each service to build the corpus of the CBO at different nodes.
  - Financial literacy programmes were aimed at developing willingness and capacity to pay to build the corpus of the CBO
  - Contribution ad valorem by 2 to 3 per cent the users for livestock services, seeds and planting materials, credit linkage entitlements from the government
  - Corpus building by internal lending of the borrowed funds from the bank, revolving fund from the MKSP.

- ***Drudgery reduction for women farmers***:

  Stringent efforts were also observed towards drudgery reduction. The main efforts undertaken were

  - Exposure and awareness campaigns on drudgery reduction technologies (e.g. smokeless stoves, effective storage of food with local resources, water filtration units, solar energy powered lanterns, LEDs, biogas, pedal-operated pumps, retrofitting batteries to cycles, shelling machines, etc.)
  - Building community assets (pulveriser, weeders, dibblers, etc.) managed on a user fee basis.

- ***A life cycle approach on gender sensitisation:*** The women members of the governance team were strengthened through leadership development, given priority for asset building and centralised in all knowledge sharing.

- ***Value chain development***: Need-based training programmes and support system were developed specifically for high-value potential crop produce, e.g. brown and liquid jaggery, durum wheat in Raybag, organic milk and milk products, tender coconut water in Gubbi.

- ***Incremental income-reduction in costs and increase in returns***

  - Reduction in the cost of cultivation has brought out by increasing the soil productivity, water use efficiency, seed rate, input substitution (seeds, fertilisers, pesticides, water, labour, cattle feed, veterinary medicines), labour use efficiency through share labour.
  - Access to bank finance reduces the borrowed costs
  - Reduction in the cost of marketing by fair trade practices in collective marketing
  - Reduction in medical expenses due to improved health having improved nutritional status

- The high density, diversified farming and agronomic practices were introduced
- The quality of agro produce with NPM and non-fertiliser usage enhance the quality of produce
- Additional income due to capital assets such as cattle, small ruminants, fishery, apiculture, irrigation assets.

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SPECIFIC CASE STUDIES

Case Study: 1

Enhanced Sustainable Income through Alternative Livelihoods: Poultry

Any allied activity coupled with agriculture gives additional support to rural life. Such allied activities improve the living conditions of the farmers' families. Many farmers have generated better income by involving in allied activities like poultry farming, goat rearing and beekeeping, etc. There is a lack of ***perfect knowledge*** about the allied activities at the village level and this is the reason why villagers in large numbers are not coming forward to take up these activities. Especially, the rural women are generally hesitant scare to come forward for such an adventure.

Smt. Dundavva Holkar, a farmer woman of Nidagundi village (one of the villages in Savasuddi Cluster) in Raibagh taluk has successfully ventured herself into poultry farming. Poultry farming, in addition to the agriculture work, has brought immense satisfaction to her life. She is a member of Kerammadevi IDF Women SHG. She is inspired by the ***regular agricultural advice, experiments shown through videos and agriculture demonstrations like kitchen gardening, etc.,*** at the SHG. Through this, she has found ***a platform*** to improve her living conditions.

After acquiring the knowledge about rearing of native breed chickens, Dundavva told her husband about her desire to start a poultry farm. She could not implement her proposal due to lack of funds. After four months, ***the KVG Bank sanctioned a loan to her SHG and*** Dundavva's share of Rs. 10,000 came in handy to fulfil her desire.

Earlier, her husband run a large-scale poultry farm but had to abandon it due to

heavy losses. The ***vast experience and the bitter lesson learnt*** at that time were the guiding force for them. This time, they concentrated on a ***small-scale poultry farm*** by rearing native chicken.

The sheds constructed earlier were vacant and they used the same for their new project. To begin with, she has acquired 500 chicks of Sahyadri and Giriraja varieties from the nearby town of Miraj by spending Rs. 12,500 at the rate of Rs. 25 per chick. She used loan proceeds and a small portion of her funds for this purpose. For feeding chicks, she used grains and readymade food available at her house. After 4-5 months, each bird weighed about 2 kg and they were sold at Rs. 300 per kg in the market. She adopted the practice of selling chicken in small quantities every month and thus, ***earned a net profit of Rs. 30000*** from the poultry farming in her maiden attempt itself.

Dundavva now has a permanent customer base and they visit her farm personally for purchase. Besides, she goes to nearby weekly markets at Raibagh, Harogeri, Sankeshwar and Athani for sale of chicken. She cleared the loan taken from SHG out of the sale proceeds and has also invested the balance amount for the purchase of additional livestock. The vegetable required for her house is grown in her kitchen garden. This has resulted in savings of Rs. 500 per month. She uses homemade medicines to control the ticks affecting buffalo and goats. She also provided lime water to buffaloes in order to mitigate the deficiency of calcium thereby increasing the yield of milk. She is saving Rs. 5000 to Rs. 6000 annually as all these requirements are met domestically.

Dundavva ***proudly states that she could receive all these benefits by utlising the knowledge acquired through video lessons at the SHG.*** She used to discuss with her husband the experiments learnt at the SHG. Dundavva is adopting various new experiments as she is getting a positive response from her husband. The success story of Dundavva Holkara in adopting an agricultural allied activity with a meagre capital investment has become an eye-opener and model for other villagers.

Smt. Dundavva Holkara
Kerammadevi IDF Women SHG
Mobile: 9902793396

Case Study: 2

Livestock and Small Ruminants Rearing as an Alternative Livelihood for Sustainable Income and Nutritional Security

Godavva Tammani Pujeri is a member of Sri Saraswati IDF Mahila Kisan SHG of Byakud village, (one of the villages in Savasuddi Cluster) Raybag taluk.

Her family has seven members comprising her husband, son, daughter-in-law and three grandchildren. Coming from an agricultural family, they own five acres of land with an open well and a bore well for irrigation. Fodder maize, cotton and wheat are the important crops raised by them and as an allied activity, they also do cattle rearing. They also have a pair of bullocks, a she-buffalo, a cow and two goats.

During 2015-16, their open well and bore well went dry due to drought. There was no fodder for cattle due to lack of monsoon and non-cultivation of rabi crops. Many sold off their cattle due to this situation.

But, Godavva did not lose heart. The information and suggestions through ***video dissemination (Digital Green)*** training in the Mahila Kisan group on agriculture and other livelihood activities which can be taken up even during the drought conditions gave her enough confidence to make up her mind. She was successful in ***dairying*** after making use of this information.

Her she-buffalo was giving less milk due to calcium deficiency. She had to depend upon the veterinary doctor for the treatment, who used to charge Rs. 300-400 per visit. Thus, 20% of the milk proceeds were spent on the treatment. But, they found a solution

to their problem after seeing a video on ***lime water and E.M. solution treatment*** shown by the IDF team using PICO projector. Once the lime water treatment began, the milk yield of the buffalo increased by one litre per day at the cost of less than a rupee (Rs. 20 a month). Hence, they gave up the idea of selling off their cattle.

Hesitation to avail loan: Godavva was not ready to avail loan when KVG bank came forward to grant a loan to her group. She was in a dilemma as she thought that she might find it difficult to repay the loan due to drought. But, taking into consideration other members' moral support and financial help, she finally agreed to avail a loan of Rs. 10,000 from the bank. Thus, the video information and bank loan helped them to increase their assets through dairying.

Using the bank loan, she purchased a goat for Rs. 9000 and later it gave birth to two kids. They sold these kids for Rs. 9000 after 3-4 months and recovered the expenses in addition to retaining the goat also.

The goat will deliver soon and thus, they no longer have the fear of loan repayment. Moreover, the goat gives one litre of milk twice a day. Godavva is quite happy to see her grandchildren healthy after consuming the goat's milk. Seeing her success, other two members of the group also have bought goats. Goats do not require fodder supply purchased from outside and any waste plant cuttings will be sufficient for them.

Godavva spent Rs. 9000 on one goat and recovered in just 6 months after selling the young ones. She made a saving of Rs. 750 a month as one litre of milk costs Rs. 25 per month. Small income sources like this will make their lives sustainable. Now, their priorities are to continue goat rearing, buy one more buffalo if an additional loan is granted and continue sustainable agriculture.

Godevva Tammani Pujeri,
Sri Saraswati IDF Mahila Kisan SHG of Byakud village
9972616274

Case Study: 3

Vegetable Cultivation as an Alternative Livelihood for Doubling the Income

Women play an important role in the smooth running of the family. Our elders have considered women as a crucial link in the family. Smt. Hasina, a woman farmer, is the best example for the above saying.

Smt. Hasina, mother of three, lives in Multanithotapatti of Yadrava village of Raibagh taluk. She owns 3.5 acres of land, of which 30 guntas are irrigated land and the rest are dependent on rainwater. There is an open well as well as a bore well for irrigation. Apart from this, she is rearing a buffalo and a goat.

In the beginning, sugarcane and fodder maize were the crops cultivated by her. In the year 2014, Smt. Hasina along with her neighbours joined together to form an SHG by the name Rajabhaksha IDF-MKSP. The activities taken up by the group in imparting agricultural knowledge introduced them to a new world. They found better change by adopting minor techniques such as use of lime water, sugarcane seed treatment, effective microorganism solution, etc.

During this period, their SHG got a loan from KVG Bank, Raibahg Branch. Smt. Hasina bought manure for the farm from her share of the loan amount of Rs.10,000. While she was thinking about utilising the balance of loan amount, a video about gardening seen by her came in handy. Inspired by the video, she decided to grow vegetables in 10 *guntas* of her farm and she bought ***tomato seedlings*** costing Rs. 900 for grafting.

She did not use any pesticides for tomato plants. As seen in the video, she sprinkled green decoction and cow urine with biopesticide tonic. By this method, she averted insects attack as well as the diseases affecting the plants.

She could earn Rs. 30,000 by selling tomatoes from mere 10 *guntas* by incurring just Rs. 10,000 as expense. Smt. Hasina earned a profit of Rs. 19,100 by growing ***tomato*** in 10 guntas within a short period of six months. Encouraged by the profit earned, she started growing ***other vegetables like ridge gourd, cluster beans,*** etc., with the available water. Her husband is now selling vegetables. Smt. Hasina says her personal life has undergone a change, thanks to the loan from the bank. "Earlier, my husband used to go to the bank for all transactions. I had neither visited the bank nor made any transactions. Now, I am happy that I am independently handling banking transactions. Besides, I have cultivated the habit of savings," says Smt. Hasina emotionally. Further, she adds with gratitude that her husband has secured ***self-employment by selling vegetables***.

Hasina has plans to launch large-scale vegetable cultivation after receiving the second round of loan. She says that there is a smooth and better coordination in conducting the activities of the group and she needs information about the government facilities available in this regard.

Smt. Hasina Vilas Multani.
Rajabhaksha IDFMKSP Group, Yadrava.
Mobile: 8971540382

Case Study: 4

Effective Management Practices for Sustainability of Agriculture

It was the acute drought during the year 2014-15 in the villages of Raibagh Taluk that forced many male members of the villages to migrate to far-off places like Goa and Bengaluru to eke out a hand-to-mouth living. The women who stayed back in the villages undertook dairy farming besides taking care of their lands. To meet their financial needs, they were engaged in odd works on daily wages. Smt. Lakshmi Gangappa Koli of Chinchali village, who was in a pathetic situation due to the drought, took courage and adopted new methods in dairy farming and agriculture, and successfully became a role model for the rest.

Pro-agricultural video came in handy: The IDF had launched a programme to empower agricultural women in this area and Smt. Lakshmi became a member of the group. She showed keen interest in the pro-agricultural videos shown in the group and in some new experiments made by the group. Her desire to help her family through dairy farming intensified.

The KVG Bank has granted a loan of Rs. 10,000 to Smt. Lakshmi through the SHG. She bought an old bullock cart for Rs. 4000 to ferry fodder from her agricultural land to home. She also bought a pair of goats for Rs. 6000. Lakshmi saved her time and energy by using the bullock cart as she could bring more fodder with fewer efforts. Already she had two buffaloes at her house. With the improvement in the supply of fodder, dairying yielded a positive result. This helped her in repaying the bank loan promptly, says Smt. Lakshmi. She also adds that the goats have multiplied and she is certain that this will help her in times of difficulty.

Growing of sugarcane through sustainable crop pattern: This is another achievement by Smt. Lakshmi. She adopted a new plan for sowing sugarcane - there will be a gap of 4 feet from one line to another and a gap of one foot between one seedling and another. This will facilitate the saving of seedlings and allow free flow of air and availability of light, besides the growth of more tillers from each seedling. She used 1.5

tonnes of seedlings in her three acres of land. Before sowing, seed treatment was made with a mixture of cow dung and cow urine. In the traditional system of sowing, 3.5 tonnes of seedlings were required.

In the traditional system, the yield was 125 tonnes of sugarcane from three acres whereas in the sustained crop system, the yield was 215 tonnes. Thus, there were big savings in seedlings with a considerable increase in the yield.

Effective use of fodder: Another new method adopted by Smt. Lakshmi was sprinkling salt and jaggery solution on fodder (both dry and wet) which were cut into small pieces. She noticed that the cattle prefer this type of fodder. Hence, there was a notable increase in the milk yield with no wastage of fodder.

Smt. Lakshmi effectively and wisely used the knowledge gained from her group and bettered her income. She used the loan amount for the purpose for which it was sanctioned and today she is educating the members of the SHG Saraswathi Swasahaya Sangha. Her family members are happy and proud of her achievement. She is leading a satisfying agricultural life, thanks to various pro-agriculture videos she has seen in the group, field demonstrations and though a small amount but a timely financial loan. She concludes, "I am grateful to KVG Bank and IDF institution for helping me lead a self-sustained life."

SEED TREATMENT

Seed treatment for sugarcane and fodder maize:

Add 3 litres of water to 1 litre of cow urine. Soak the seedlings of sugarcane/fodder maize in this solution and dry them under shade for sometime before sowing. This gives resistance power and reduces withering of crops, which has resulted in increase in yield.

Case Study: 5

Enhanced Income from Poultry by Rearing the 'Javari' breed

Ashwini Mallikarjuna Magadumma of Yelparatti village who has studied till 7th Grade has got a land extent of 10 *guntas.* For the sake of livelihood, she took another 10 *guntas* of land on lease and was growing fodder maize when she faced shortage of funds for land extension. Further, Ashwini approached Karnataka Vikas Grameena Bank and availed a loan of Rs 10,000. She wanted to start self-employment and constructed a poultry shed with the loan amount. Using her personal money, she brought 500 broiler breed chicks and started the poultry business.

Initially, some chicks died and with the remaining birds, she made a profit of Rs.7,000 after deducting the maintenance costs. She also sold the bird manure for Rs. 13,000 and made an overall profit of Rs. 20,000. Secondly, in the form of O.D., she got a loan of Rs. 5,000 from the bank. She further invested Rs. 7,000 from the previous profit then the OD loan Rs. 5,000 and Rs. 3,000 from her savings (totally Rs. 15,000) for buying 500 chicks again at Rs. 30 per bird. But this time it was a local breed called "Javari". Ashwini spent nearly Rs. 30,000 on the readymade fodder alone. Out of 500 chicks, 400 are healthy and the veterinary doctor inspects the chicks once in 15 days.

As there is very good demand and price for the "Javari" hens, there is a chance of each bird fetching Rs. 250. So after rearing this breed for 3 to 4 months, Ashwini could earn Rs. 1,00,000. So she is expecting a profit of Rs. 50,000 even after deducting Rs. 50,000 as maintenance costs. With the cooperation and encouragement from her husband Mr. Mallikarjuna, she feeds the chicks and maintains the poultry shed and now poultry has become the major income source for the family.

Future Plan: Ashwini is planning to extend the capacity to 1000 chicks from the present capacity of 500 chicks and trying to invest Rs. 1,30,000 for the same.

Ashwini Mallikarjuna Magadumma,
SHG Yelparatti,
Mob: 7353237138, 7022445767

Case Study: 6

Realising Dreams through Karnataka Vikas Grameena Bank (KVGB)

One can find not one or two but scores of success stories under the Mahila Kisan Sashaktikaran Pariyojana (MKSP). Each of them has been able to bring in one or the other welcome changes in their lives. Smt. Mahadevi Patil of Savasuddi village in Raibagh taluk is a noteworthy case under this project. She has had formal education till 7th class. The small family of Smt Mahadevi, who is a member of Shri Bhagammadevi IDF Mahila Kisan SHG, comprises five members. Her husband runs a small mobile repair shop in Savasuddi village and this was their main source of livelihood. They own two acres of rainfed land where they grow crops such as jowar, emmar wheat, maize and other dry crops. In addition, she also tends to three heads of cattle.

The video training programmes conducted on livelihoods, sustainable agriculture and animal husbandry under the project kindled keen interest in her. Motivated by these training programmes, she has adopted many of the progressive practices. She earnestly put into practice the herbal-based "ethno-veterinary" practices to effectively control the ticks on her cattle, thereby saving Rs.80-100 which she normally used to spend on the insecticides purchased from market.

She is also using the "Effective Microorganism Solution (EMS)" for her milking cattle which has resulted in an increase in milk yield by about half a litre. At Rs. 16 per day, she is able to generate Rs.480 per month as incremental income from this increased milk yield. Now, she also uses the simple "Lime water Solution" therapy, which effectively combats calcium deficiency in milch cattle. Mahadevi is able to save almost Rs. 450 which otherwise she had to spend on treating this deficiency. This has also resulted in better health of the animals together with increased milk yield. She has also benefitted considerably by using aloe vera as a de-worming medication. Besides saving a considerable amount of money through these simple yet effective adoptions, she has also been able to register a modest increase in incomes and she is indeed happy about it.

Loan Assistance:

Smt. Mahadevi, although busily engaged in all the above activities, was still keen

on finding ways to supplement her family income through other means. Although she had been trained in tailoring, lack of finance was coming in the way of taking up this activity for increasing her family income. Under the MKSP Project, when her SHG was credit linked to the branch of Karnataka Vikas Grameena Bank (KVGB), it was a dream-come-true situation for her. With the first loan of Rs. 10,000 that she got from the Bank, she lost no time in reviving her favourite profession by purchasing a new sewing machine. Since she is a good tailor for ladies' garments, the demand for her services is rather good. After tending her cattle and attending to other farm-related work, she takes care of her family and home responsibilities and still manages to steal some time for her chosen vocation.

She earns Rs. 1000-1200 per month from tailoring and is able to easily repay the loan instalments. "Since I earn money daily through tailoring, I do not feel the strain of the loan repayments. If women like us utilise the loan amount properly, we can not only repay the loans easily but also create some assets for ourselves from the surplus," she opines with a firm conviction.

Smt. Mahadevi, who strives to use all her time to increase her income levels, is a striking model of the striving class of poor rural women folk worthy of emulation. She never fails to acknowledge the guidance, help and assistance rendered to her by IDF and the financial aid given by KVGB in pursuing the vocation of her choice!

It was a year of drought, life was miserable as there were no returns from agriculture and shortage of drinking water. The situation made Mangala down with her hope, but she propelled herself by chasing the worse and was confident that the situation will not remain same. Mangala being housewife owns three calves, six goats and 2.2 acres of rainfed land. She grows fodder maize and corn maize under rainfed condition, apart from maize she also grows required household grains and pulses. Mangala Naik an active member of Renukadevi IDF Mahila Kisan Sangha of Savsudhi Panchayat of Raybagh Taluk. Her husband a farmer and daily wage worker.

She was actively participating in video demonstrations, livestock filed school and other activities. She adopted some of the aspects of sustainable agriculture practices. She

was feeding her milch animal with lime water and EM solution which she learnt through video demonstration, which eventually resulted in increase in milk yield by half a litre. One litre of milk costs Rs. 20 and with an increase in yield by half a litre, her monthly income went up by Rs. 300.

Title	Details	Total
Savings	Expenditure on Calcium deficiency- Rs. 400 Expenditure on De-worming- Rs. 100 Expenditure on Cattle feed- Rs. 2700	3200.00
Increase in income	Profit earned by an increase in yield of milk using lime water and EM solution	1300.00
Total Profit	Increase in Income + Decrease in Expenditure	4500.00

Apart from participating in video demonstrations and filed schools, she availed a loan of Rs. 10,000 from Karnataka Vikas Grameena Bank through SHG-Bank linkage. With this, she purchased two goats and after three months, each one gave birth to two kids, each costing Rs. 3000. From each goat, she earned a profit of Rs. 6000 and with two goats and kids, she owns livestock assets worth Rs. 22,000. From the returns, she is repaying the loan also leading a life. During drought, animals like cow/buffalo require more water and fodder whereas goat requires comparatively less. Whereas sheep and goat are sources of income security, goat milk ensures nutrition security to her family. She is repaying the first instalment of the loan and is confident of availing the second instalment and making profit out of it.

Smt. Mahadevi Lakkanagouda Patil
Shri Bhagammadevi IDF Mahila Kisan SHG
Savasuddi

Case Study: 7

"What one gets for Rs. 10,000" - an answer by Neelavva

Mahila Kisans of Raybhag have aptly answered the above question by their deed. Neelavva is one such Mahila Kisan, who trebled her investment of Rs. 10,000 in just 6 months. Neelavva Gopal Nayak hails from an agricultural family in Alaknoor village of Raybhag taluk. She is a member of Sri. Mahalaxmi IDF Mahila Kisan Sangh. She availed a loan of Rs. 10,000 from Harugeri branch of KVGB and by adding Rs. 4000 from her savings, purchased two sheep. Fortunately, within 8 days, both sheep calved four lambs, including two males. During Bakird, there is a good demand for mutton, and since the animals are well-fed, Neelavva expects an income of Rs. 20,000 by selling two of them. She plans to continue rearing the remaining two. Incremental income statistics, since last 8 months, in respect of Neelavva is as below.

Initial Investment	Activity chosen	Incremental income
Rs. 14000 Bank loan - 10,000 Own funds - 4,000	Sheep rearing (two sheep)	Two lambs – Rs. 14,000 Two lambs (male) - Rs. 20,000 Two mother sheep – Rs. 14,000
	Total	48,000

Neelavva's family used to cultivate 3 acres of land and raise maize and cotton using the irrigation facility from a bore well. However, due to the drought in 2015, the bore well dried creating a shortage of water for field, animals and family as well. To mitigate hardship, her husband migrated to another place in search of better livelihood incomes. Neelavva, however, stayed back and evinced great interest in videos about animal husbandry shown by IDF to her group members. She has adopted various new techniques like lime water administration and pest control apart from LEISA. Neelavva says these training programmes have made her more confident and she is running the household even in the absence of her husband. "Joining an SHG will merely save Rs. 10 per week" was her initial thought. However, after joining the Sri. Mahalakshmi IDF Mahila Kisan Sangh, she has changed that opinion. "I have received various types of training, met new people and have learnt about various schemes of the government," says a

confident Neelavva - an apt, confident reply to "What one gets for Rs. 10,000 by a confident Mahila Kisan, by her deeds.

Neelavva Gopal Nayak
Alkahnoor
Sri. Mahalakshmi IDF Mahila Kisan Sangh

Case Study: 8

How Dairy Farming Helped Parvathi Banasi to overcome drought

Due to the shortage of water and cattle feed during the drought in 2014-15, several families in Bekkeri village of Raybagh taluk planned to sell their cattle. It was painful for the farmer families to sell their animals that were used in dairy farming and agriculture fields, the main source of their livelihood.

The situation of Mrs. Parvathi Banasi, an agriculturist of the same village, was too pathetic. She had no cattle and the death of her husband compelled her to take the responsibility of maintaining the family besides meeting the educational expenses of her two children. She had four acres of land. Had there been good rains, there would have been a good harvest of wheat, sugarcane and emmer wheat. Parvathi took guidance from SHG to cultivate sugarcane using less water. As per the information given by the SHG, she adopted the sustainable agricultural practice of growing sugarcane by seed treatment, but the crop dried up. Consequently, she decided to hand over the land on lease for cultivation next year and concentrate on dairy farming and gardening to meet the household expenses. But she didn't have sufficient money to buy a buffalo.

At this juncture, her SHG group got the loan sanctioned from K.V.G. Bank. She got Rs. 10,000 as her share of loan and adding her savings to it, she purchased one milch buffalo costing Rs. 15,000. The buffalo yielded 3 litres of milk daily. Of this, she used to keep 1 litre for the family and the remaining 2 litres were sold to sustain family expenses.

Also, she didn't forget to repay the loan instalment in time. After meeting the first round of loan repayment by all the SHG members, the bank extended them the 2nd round of loan. This time also, she bought one more buffalo. She is earning around Rs. 400 per week by selling milk. Parvathi adopted the following tips by for increasing milk yield. To overcome the calcium deficiency faced by the milch buffalo, the SHG advised her to use lime water. Having followed their suggestion, there was an increase in milk yield. Also, there is an increase in consumption of fodder since fodder was being fed in small pieces along with jaggery and salt. With dairy farming, Smt. Parvathi Banasi found a way to overcome the hardship of her personal life. She thus becomes a role model for others who are confronting such adverse situations.

Case Study: 9

Agricultural Experiments, the Guiding Lights for Rukmavva Vinod Patil

Nowadays, rural women are living in great difficulties. They are balancing various household works of bringing up children, household responsibilities, managing the kitchen and running the family affairs. They are struggling to earn money for these petty expenses. We can find a few women here and there who have adopted dairy, kitchen garden, vegetable vending, etc., and come out successful.

Smt. Rukmavva, a resident of Bekkeri Banasi Tota of Rayabag taluk, is one such successful woman who adopted sustainable agriculture practices for reducing cultivation expenses. In addition to this, she successfully adopted a few small agricultural experiments.

Rukmavaa has studied up to 5th standard. The personnel from IDF, Rayabag imparted knowledge on new agricultural practices through Mahila Kisan Sashastrikaran Scheme to Rukmavva who was practising the traditional agricultural methods for decades. The videos of improved agricultural practices screened by IDF, in addition to the lessons on sustainable agricultural practices, paid her rich dividends.

During the first year (2014), Rukmavva adopted those experiments successfully. Subsequently, during the second year (2015), her self-help group (SHG) secured a loan under financial inclusion by Karnataka Vikas Garmin Bank. She took a loan of Rs.10,000 in the first cycle, repaid that loan within the stipulated time and got second instalment of Rs. 10,000.

While she purchased a buffalo with the first loan and got a profit of Rs. 10,000, she purchased a cow out next time. She made a total profit of Rs. 35,000 in the last one-and-a-half year period by rearing the buffalo and cow. She has effectively adopted the

use of lime water which she learnt from the video dissemination. In her experience, the use of lime water has increased the milk yield of both the cow and buffalo, on an average, by one litre per day.

Adoption of new experiments: She adopted a few simple and less expensive experiments to realise the effective utilisation of the loan amount. Use of lime water helped in overcoming the calcium deficiency in lactating animals. She controlled the tick menace in cows and buffaloes by using locally available raw materials and used EM Solution (effective microorganism) to increase the appetite of the animals and thereby increasing the income from dairying. This coupled with efficient use of fodder increased milk production and doubled her income.

Blossom of turmeric in sustainable methods: During the year 2016, Rukmavva realised that yield can be increased if the seed treatment is done in a proper manner. Turmeric seeds were given seed treatment using a mixture of cow dung and urine. Apart from this, adoption of sustainable approach by giving more spacing between the plants has resulted in reduction in seed requirement from three quintals for 15 guntas in traditional method to one quintal. By reducing the seed requirement by two quintals, she could save Rs. 6000 (one quintal of turmeric seed costs Rs. 3000). Accordingly, she is expecting a good crop and increase in income.

Rukmavva, is now helping her family and children's education and moving towards 'self-reliance' by adopting new experiments of sustainable agriculture.

Rukmavva Beerappa Bhanasi
Amogha Siddeshwara SHG

Case Study: 10

Lime Water – A Source for More Income with Least Expenses

Smt. Sangeetha Bhajanthri hails from a place called Bhajanthri Thotapatti of Nidagundi village in Raibagh taluk of Belagavi district. Sangeetha has a fairly big family with 9 members compriisng husband, five children and parents-in-law. All the five children – four daughters and a son- are going to school. She is growing maize, sugarcane, wheat, gram and vegetables in her 1 acre and 20 guntas of semi-irrigated land. She owns a house and is rearing a native breed cow and a buffalo for milk and manure. Presently, the native breed cow is milching. Her husband Mr. Hanumantha Bhajantri is engaged in agriculture and works as labour when there is no agricultural activity.

Nearly eight months ago, IDF organisation came to this village and initiated implementation of Mahila Kissan Empowerment Project. Information and guidance of this project was given through street drama and short film. Accordingly, Sree Mayavathi IDF Mahila Kissan SHG was formed and Smt. Sangeetha Hanumatha Bhajantri became a member. Her savings per week was Rs. 10 in the SHG. Inspired by the video shown at the Mahila Kisan Yojana's weekly meeting about the importance of lime water, she decided to prepare the same. Accordingly, she purchased 0.5 kg limestone and a 20-litre capacity plastic bucket with a lid.

Lime water was prepared by soaking 0.5 kg limestone in 2 litres of hot water and stirred with a long stick by adding 18 litres of water and the solution was kept for 12 hours before the same was ready for use. It has been securely closed with a lid and kept in the kitchen. She informed us that the kitchen is a safe place for storing lime water. One litre of lime water is mixed with liquid feed for the consumption of cow and buffalo every day.

There was a considerable increase in milk yield after 8 days of using lime water. Earlier, milk yield was 0.5 litre each in the morning and evening. After using lime water, the milk yield increased to 1.25 litres each in the morning and evening. Out of 2.5 litres

of milk yielded by the cow and buffalo, 1 litre was used for domestic consumption. Remaining 1.5 litres were sold at the rate of Rs. 25 per litre to the milkman. The total earnings per month from the sale of milk was Rs. 1125. To prepare lime water, the expense incurred was barely Rs. 15 per month at 50 paise per day.

The income generated by the sale of milk helped her to meet the educational expenses of children, she says proudly. Mahila Kisan Smt. Sangeetha Hanumantha Bhajantri has learnt the preparation and use of lime water on her own and has stored 10 kg of limestone at her house. With this, she has made plans for continuous earnings in future. The other members of the group have come forward to prepare lime water which helps in getting more income with least expenditure.

Smt. Sangeetha Hanumatha Bhajanthri,
Mayavathi IDF Mahila Kissan SHG.
Mobile: 9902426378

Case Study: 11

Goat – a Livelihood Support

Savakka Shivappa Nayika is from Kempatti village of Raybag taluk. She has a six-member family, two acres of land, a she-buffalo, a goat and a pair of bullocks. Having studied up to tenth standard, she plays a major role in leading her family. She could increase her family income by adopting certain simple techniques learnt from the project she was introduced to.

Using the loan provided by KVG Bank, she purchased a goat for Rs. 10,000, which gave birth to two young ones. They were sold after six months each at the rate of Rs. 4000. Stoppage of lactation yield from the she-buffalo was compensated by the goat's milk which meant a savings of Rs. 400 per month which she otherwise would have spent towards milk. They could save Rs. 2000 from the goat's milk in five months. Thus, their income generation was Rs. 12,000 in just one year from goats. Still, the mother goat has the potential to generate more income.

Sugarcane, wheat and fodder maize are the important crops being grown in their two-acre land. Their future plans include enhancing the goat population, adopting mixed cropping and launching kitchen gardening to enhance their family income.

Savakka Shivappa Nayika
Kempatti SHG

Case Study: 12

Mixed Farming in Sugarcane

Sugarcane brings many scenarios before us - struggle with sugar factories, fight for a suitable price, forcing for government's intervention, etc. Sugarcane is a long-duration crop which demands more water and also a cost-intensive crop. One has to wait for 18 months to get the sale proceeds of sugarcane. But, it is not a matter of concern for Savithri – Anneshappa Vali couple, who have started generating income from one month of planting sugarcane. The income is guaranteed for the next six months continuously. You can see this miracle in Handigunda village of Raybag taluk, Belagavi district. The couple wons land to the extent of one-and-a-half acres. Sugarcane is grown in one acre and this one acre is further divided into two parts and grown with a fusion of over seventeen different crops in half-acre and also followed mixed cropping of sugarcane and cabbage in another half acre.

Onion, garlic, brinjal, cowpea, marigold, jower, methi, palak, tomato, groundnut, ridge gourd, lady's finger, beans, maize, green gram, millets are the mixed crops grown for household purpose and sale. It has dual advantages - instead of fetching vegetables once a week from Harugeri weekly bazaar situated 10 km away, they now go to the same bazaar for selling their vegetables and earn income.

"Till April 2016, we have received income around Rs. 7000-8000; we have stopped spending Rs. 150 every week in the weekly bazaar," explains the couple. They expect an income of Rs. 20,000 at the end of the cropping season.

They do not sow all the mixed crops at once. Based on their experience, they decided what should be the first and the next. While greens are sown in the beginning, other vegetables follow after 1-2 weeks. This method ensures continuous crop yield and income. Irrigation facility for sugarcane also takes care of other mixed crops. Moreover, mixed crops act as mulching and conserve moisture for long in the soil. They have realised saving water by adopting this method. Power saving was also made possible. They have adopted the following changes in sugarcane cultivation practices in the year 2016:

1. More spacing in sugarcane planting
2. Mixed cropping

Spacing followed in sugarcane transplantation is 4 feet between rows and 1 ½ feet plants. It was actually 2 ½ feet during previous years. More spacing gave scope for mixed cropping.

They have learnt this new method from Mahila Kisan Sashaktikaran Yojana. For 2.5 years, Savithri has been a member of Bharath Matha IDF Mahila Kisan Swa-sahaaya Sangha formed under MKSP being implemented by the Initiatives for Development Foundation. They have successfully adopted this sustainable agriculture practice under the principle of low-cost cultivation after having undergone training through video dissemination under the project. They are now gradually focusing on reduction in the use of chemical fertilizers and pesticides and following organic farming. All these are cost-cutting farm practices.

A field day was arranged on 'Mixed cropping in Sugarcane' on 14th April 2016 to create awareness among the neighbouring farmers about this practice. Shri. P. Rajeev, MLA from Kudachi, was the chief guest. He visited Vali's farm during the event and suggested the Agriculture Dept. to educate others to follow this practice. He also appealed to the farmers and farm women gathered over there to grow different vegetables as mixed crops without depending on a single crop like sugarcane, conserve water, increase income, and to start Farmer Producer Companies. Shri. Venkatarama Reddy Patil, Joint Director of Agriculture, Belagavi district was also present. It was a surprise to see over 600 farm women and interested masses from neighbouring villages visiting their farm on that day.

Simple storage method for Onion:

Onion is their commercial crop and it is stored in anticipation of a suitable price. The method adopted is indeed very simple. Nearly 6-feet high wooden poles are erected on the ground and tied side by side (Size is 4 x 3 feet). Coconut leaves are spread on the roof to as a protection from heat. The floor is also coved with coconut leaves and onion is stored inside. Onion does not get spoiled due to aeration, which is possible as wooden

Other free-time jobs:

They also run a vermicelli production unit by purchasing *rava* from the market and producing vermicelli with the help of a simple equipment. There is a great demand for vermicelli and people from neighbouring villages come to their doorstep to buy. This also serves as an important source of income for them. IDF has ensured various sources of income to improve their lives. They are benefitted from nutritious food, low-cost agriculture, use of locally available resources, etc.

Savithri Anneshappa Vali
Bharath Matha Swa-sahaaya Sangha
Handigunda

Case Study: 13

Profit from Ram Shivagonda Mugadum

IDF organisation is striving to inculcate self-confidence and courage among the agricultural women in Raibagh area. There are a good number of successful women who have responded to these efforts. Smt. Sunanda Mallappa Yellatti, who belongs to a poor agricultural family, is one among them. The four member family comprises her husband and two sons. The younger son is studying in 9th standard and helping her in agricultural activities and the other one is studying in 10th standard. Her husband Shri. Mallappa works as an agricultural labour.

Before forming Mahila Kissan Sangha (SHG), her daily wages was just sufficient to meet household expenses. She was incurring more expenses for agricultural activities. The expenses incurred for raising crop over year-long efforts were on the higher side with negligible profit. Under the circumstances, the Mahila Kissan Empowerment Project brought a sea change in the situation.

Smt. Sunanda joined this project by becoming a member of Sree Mallikarjuna Mahila Kissan Sangha. She learnt from this group on saving money every week besides acquiring various latest information with regard to agriculture and dairy farming. This helped her a lot in saving agricultural expenses.

Subsequently, she could obtain a direct loan of Rs. 10,000 from KVG Bank. Based on her husband's advice, she purchased 2 rams from Raibahg market and started rearing them. She sold them for Rs. 13,000 each after 5 months. She had spend Rs. 3600 towards the purchase of grains to feed rams. Except for this, there were no other expenses. She has used aloe vera, a readily available free home medicine, for de-worming the rams. Thus, she made a profit of Rs. 12,400 after meeting all the expenses. The profit earned was used for further agricultural activities.

1	Purchase of rams	10,000
2	Purchase of grains for fodder	3,600
3	Sale of rams	26,000
4	Total profit	12,400

Smt. Sunanda Mallappa Yellatti.

Sree Mallikarjuna Mahila Kisan Sangha, Bekkeri

Case Study: 14

One Cow, Many Benefits

Women perform many important agricultural activities, right from sowing to harvesting. This apart, they also engage themselves in allied activities of agriculture, especially animal husbandry. Animal husbandry, especially dairying, has become a major financial support to many families in rural areas. Thayavva w/o Kashappa Saptasagar is one such family from Morab. The family consists of five members, including three children. Kashappa is a small farmer, who also works as a coolie when time permits. After attending to her household chores, Tayavva assists Kashappa in agricultural work. Things went on like this year after year till Tayavva became a member of an SHG under MKSP. Tayavva joined "Sree Amrutavarshini" IDF Mahila Kisan Sangh and saved a specific amount every week. She learnt new techniques under Least External Inputs in Sustainable Agriculture (LEISA). Most of the learning happened through repeated video shows, which left a lasting impression on her mind.

LEISA techniques helped Tayavva family to reduce the input cost of agricultural activities. The main income, however, started flowing in from a cow she purchased. She availed a loan of Rs. 10,000 from KVGB through her self-help group. The deficit amount of Rs. 25,000 was borrowed from a local herdsman in consultation with her husband. Cow calved within a few days and started yielding 10 litres of milk per day. Tayavva gained some additional knowledge in dairy farming through videos being shown to her and her group members. She mastered the art of preparing lime water and administered the same to the cow. The milk yield went up to 13 litres (after 8 days) from 10 litres. At Rs. 20 per litre, Tayavva was able to earn Rs. 7800 per month (20x13x30). After repaying the bank/ herdsman loan and fodder expenses, Tayavva has an incremental income of Rs. 1500 every month. She is utilising the amount towards educational expenses of her children apart from meeting routine household expenses. "The days of rain-dependent income generation are gone now. I no longer need a hand loan for meeting emergencies," concludes a beaming Thayavva.

Thayavva Kashappa Saptasagar
Sri Amrut Varshini IDF Mahila Sangh Morab

Case Study: 15

Buffalo Rearing Helps Earn Livelihood during Drought Vittal Baragani

"Information about agriculture coupled with financial assistance gave immense strength," says Smt. Vimala. Smt. Vimala is an illustrious example of making excellent achievement if proper training and guidance are given to a woman farmer. Smt. Vimala, who has been educated up to 10th Standard, is a member of self-help group today. With high self-confidence, she has acquired the required skill and taken entire responsibility of managing the SHG successfully.

Smt. Vimala is living in Kalli Thotapatti of Yadrava village in Raibaug taluk. Her seven-member family owns one acre of land, two buffaloes and two goats. She was afraid when staff members of IDF organisation came forward to form an SHG. Hesitantly, she became a member of the group. Gradually, she started delivering welcome speech and vote of thanks, participating in activities like debate, farmers' field school, video exhibition, adoption of sustained farming, etc.

She became an active member of the group and never skipped weekly meetings. After witnessing videos in the group, she adopted various simple agricultural techniques in her home as well as in the fields. The following table shows the details of expenses incurred and profit earned after adopting the techniques (All calculations are for the period of eight months only):

S. No.	Adoption	Expenses (Rs.)	Benefit	Profit (Rs.)
1	Lime water	20	Increase of half-a-litre milk per day (12x30=360x8)	2880
2	Effective use of fodder	-	Savings in fodder	2000
3	Cow urine with biopesticide tonic	-	Savings in Medicine expenses	2000
4	Ticks Control	-	Savings in Medicine expenses	200
5	De-worming in Sheep/goats	-	Savings in Medicine expenses	50
6	*Jeevamrutha liquid manure*	100	Savings in expenses of chemical fertilizer	5000
7	Entero toxinia	-	Savings in Medicine expenses	300
	TOTAL	120	TOTAL	12430

Karnataka Grameena Vikasa Bank, Raibagh Branch sanctioned a loan to SHG in which Smt. Vimala was a member and she got a loan of Rs. 10,000 as her share. By adding Rs. 20,000, she has purchased a buffalo for Rs. 30,000. Every morning she sells 3 litres of milk at Rs. 25 per litre and earns Rs. 2250 per month from the sale of milk at Rs. 75 per day.

After payment of loan instalment every month, she gets Rs. 1200 for family expenses thanks to buffalo rearing. The association with the SHG bettered Smt. Vimala's communication skills. She had no experience in banking transactions till she joined the SHG, but today she goes to the bank for transactions independently.

Smt. Vimala has developed leadership qualities and is proud to say that she is going to build a cowshed when she gets the next round of loan. To sum up, Smt. Vimala stands as a role model in effectively using the loan amount for economic development.

Smt. Vimala Santhosh Rangannavar,

Sree Halasiddeshwara I.D.F. Mahila Kisan Sangha,

Kanchakarawadi.

Mobile: 97405 60435

Case Study: 16

Credit Ignites Sustainable Agriculture and Livestock Practices

The IDF, in partnership with KVGB, formed a nine-member MK SHG named Kataveera in Bekkeri village of Raybag taluk in September 2014. They are credit-linked @ Rs. 10,000 per member through KVGB with OD facility which is utilised for sustainable agriculture and livestock activities by the SHG members. Kataveera SHG members (Rs. 10 by each member) save regularly at weekly meetings with an accumulated savings of Rs. 3200. They have adopted sustainable practices in crops and livestock to enhance their income. The following changes have been witnessed among the SHG families:

- Three members have recorded increase of milk yield by 1 litre per day after feeding lime water to their cows and buffalos. Lime water feeding has resulted in better feeding habit and health of the animals.
- Nine members have adopted aloe vera as the de-worming agent for kids and calves resulting in their better health. This has helped to arrest diarrhoea also. Two members have adopted ethnoveterinary practice for control of ticks in cattle.
- All members have adopted seed treatment for maize, resulting in better germination and crop stand.

- All members have adopted kitchen gardening, thereby reducing the vegetable expenditure of the family.
- Three members have sprayed fermented buttermilk for pest control in crops.

The wealth generation by Kataveera SHG in 2014-15 is depicted below:

S.No.	Particulars	Details	Total Amount (Rs.)
1	Reduction in costs	@ 500 per member	5000
2	Increase in income	Increased milk production @ 1 litre per day (Rs. 20) for 3 members, 5 months	9000
		Income due to diversified crops	10,000
		Income from vegetables through kitchen gardening	20000
3	Total enhanced income	Reduced cost and increased income	44000

Timely credit linkage to SHG has helped us to purchase seeds for sowing, agriculture activities and dairying

-Impressions of Kataveera SHG Members

Case study: 17

Mayavathi SHG-The Model Group in Loan Utilisation

Mayavathi SHG was formed on 17th October, 2014 at Nidagundhi village of Raybagh taluk, Belagavi district by Initiatives for Development Foundation (IDF) under the MKSP programme of Ministry of Rural Development, Government of India. The group consists of 13 poor woman farmers with a savings of Rs. 10,000 till July 2015. They availed a loan of Rs. 1,30,000 from KVG Bank since IDF and KVG have entered into an agreement for the purpose of loan linkage.

Loan Utilisation: Out of 13 members, Smt. Suvarna Bhajantri, Thyagavva, Champavva, Bhimappa Nayak, Manjula Shrikanth Bhajanthri and Mahadevi Bhajanthri utilised the loan for purchasing goats, while others utilised for purchasing seeds and other agriculture inputs.

Loan Repayment: By July 2015, all the group members repaid five instalments with each one paying Rs. 1084. Smt.Mahadevi, with the overdraft facility the bank had given, availed an additional loan of Rs. 20,000 apart from Rs. 10,000 which was previously sanctioned for the purchase of seeds, agriculture inputs and fruit selling business. There is unity and coordination among the group members, they meet every week, they do help each other in case a particular member find difficulty to repay, each member take responsibility to repay the loan amount to the bank account on a rotation basis every week.

S. No.	Adopted sustainable practices	No. of members adopted	Benefits
1	Use of lime water	3 members	Increase in yield of milk by one litre in both buffaloes and cow, increase in consumption of feed and animals look healthy.
2	Use of aloe vera	All members	Sheep and goats were relived from roundworms, it has cured diarrhoea and animals found healthy
3	Sustainable sugarcane and maize cultivation	2 members	This method was adopted to practice in 2015 Kharif, yield analysis will be done once the crop harvested.
4	Spraying of sour buttermilk	2 members	Pest infestation is under control for marigold and sugarcane
5	Vaccination to livestock	8 members	Foot-and-mouth disease brought under control

"In our group, apart from savings and availing loan, we also learn about sustainable agriculture practices. We are being educated through video demonstrations which is helpful and easy to understand," say the group members.

For more information, contact group members: 9980026550, 9741966530

Case Study: 18

SHG Activities Change the Livelihoods of Farm Women

There are 31 Mahila Kisan SHGs in Handigund village of Raybag. Formed in January 2015, Sri. Bannilaxmi MK SHG has 10 members. Majority of the members are small farmers having 1-1.5 acres of land. The participation of women in the SHG was 60-70% initially with only three members being literate. With digital training programmes and disciplined SHG meetings, the participation has reached 95-100% now. They have undergone over 40 digital training programmes through video dissemination of sustainable agriculture technologies since inception through 66 SHG meetings at weekly intervals. The following changes have taken place among the SHG members during the last one-and-a-half year due to the activities related to SHG practices, agriculture and livestock:

- Seven members have learnt to sign
- The menfolk have started supporting them proactively
- Good SHG practices such as regular savings, timely meetings, discussion and regular repayment of credit
- Book writing and bank transaction by SHG members
- Fixed deposit of Rs. 10,000 in KVGB branch by weekly savings of Rs. 20 by each member
- Adoption of sustainable practices in crops and livestock such as multi-cropping, botanical pesticides, Effective Microorganisms (EM) for livestock, jeevamrutha, asafoetida and fermented buttermilk spray, lime water, effective utilisation of fodder, ethnoveterinary practices for worms and common fever, etc.
- Utilisation of external credit for agriculture, livestock assets, business and children's education

Credit linkage has been done with KVGB @ Rs. 10,000 per member through an overdraft facility. A majority of them (7 out of 10) have utilised this credit for crops, purchase of goats and cow. The income enhancement of these families due to credit

utilisation is Rs. 15,000 to Rs. 25,000 per family so far due to crop intensification practice, multi-cropping and vegetable production, milk production/selling and livestock assets creation through small ruminants. The table below depicts the utilisation of credit by individual members of the SHG.

S. No.	Name	Credit Amt (Rs.)	Utilised for	Benefit
1	Shobha Madgum	10,000	Crop production	Rs. 25,000
2	Mahananda Talakatti	10,000	Goat rearing	Two kids
3	Sattevva Mygur	10,000	Goat rearing	Two kids
4	Sunanda Sullananvar	10,000	Cow purchase	Rs. 15,000 besides and a calf
5	Doddavva Dummani	10,000	Goat rearing	
6	Basalingavva Sullannavar	10,000	Kirani stores	
7	Shantavva Ganagi	10,000	Goat rearing	Two kids
8	Suvarna Sullannavar	10,000	Children's education	
9	Danavva Mutapathi	10,000	Vegetable business	
10	Lakkavva Handigund	10,000	Goat rearing	Two kids

What the Bannilaxmi SHG members opine!

"Savings and loans were the meanings attached to SHGs previously. Now we have realised that SHG activity can educate us on agriculture and livestock production leading to betterment of our livelihoods"

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