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# AN IN DEPTH ANALYSIS ON HOW TO INCREASE FARMERS INCOME IN THE DISTRICT OF KARNAL, HARYANA THROUGH DAIRY FARMING

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## ABSTRACT

The research uses primary data to analyse the income generated from dairy farming in the district of Karnal, Haryana. Are the farmers totally dependent on dairy farming? Has dairy farming over the years become an important source of income? Are there government schemes that can enhance dairy production? Are the farmers aware of such schemes? These and similar such types of questions will be attempted in the course of the paper.

**Keywords** - Dairy farming, increasing income, government scheme, Karnal

## 1. Introduction

Karnal, Haryana is home to Asia's largest dairy research where NDRI(National Dairy Research Institute)is housed. It would be possible to obtain primary data by collaborating with NDRI and would be in a position to obtain reliable information from the farmers. Haryana being one of India's most progressive states is acknowledged for its dairy cattle, especially the 'Murrah' Buffaloes and Haryana Cows. Agriculture being the main industry in the state's economy to increase incomes of all sections of farmers, it is necessary to develop dairy and cattle farming as a way to improve the living standards of the farmers.

Dedicated farmers tend to their precious livestock with care and expertise. India is an agro based economy where cattle farming is an important occupation. It has the largest cattle population in the world (approx 192 million)(2019) and is the largest producer of milk(194.8 million metric tons)(2019) which is around 22 percent of the global milk production. It is also home to various cattle breeds such as the Gir, Sahiwal, Red Sindhi, Tharparkar, and Jersey. Despite the importance of the agricultural sector, over 20 percent of the farmer population in the country lives below the poverty line(Jun-2019). A very large proportion of farming households in central

  

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and eastern states where (23 percent–45 percent) (Jun-2019)live below the poverty line (BPL) which is higher than the national average (22.5 percent)(2019). The proportion of BPL farming households (17.5 percent–22.5 percent)(2019), in some of the agriculturally progressive states, such as Gujarat, Karnataka, Maharashtra, and Tamil Nadu, is close to the national average.It is important that these farmers find alternative methods to increase their income. Dairy farmers in Karnal have an alternative source. For this to be effective the farmers should know about government schemes such that they could use them judiciously. Haryana, being one of India's smallest states with 1.3 percent of the nation's total land area, plays an extremely significant role in the country's cattle industry. The State's animal husbandry operations play a critical role in sustaining the rural economy through a variety of contributions that include :

- revenue creation,
- draught power,
- socioeconomic uplift,
- job possibilities,
- improved human nutrition through livestock products like milk, eggs, and meat, etc.

**Figure 1: Different species of cows in Karnal, Haryana**

Source: Google image

  

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## 2. Literature Review

Agriculture is the foundation of India's livelihood. The sector employs about 49 percent(Jan-2023) of the workforce and accounts for 17 percent(2023) of India's GDP. Dairy farming is one of the most important occupations of the agricultural sector in India, not to mention India's dairy industry which is the largest in the world. It is responsible for 23 percent(2023) of the global milk production and supports more than 8 crore farmers, accounting for 5 percent(2023) of the national economy. With only 4 percent of the world's water resources and 2.4 percent of the world's land, India supports 17.8 percent of the world's population and 15 percent(2023) of the livestock population. India has a varied food and non-food agriculture base, which increases the prospect of India becoming a world agricultural trade leader. Needless to say, Agriculture is a critical sector of the economy for long term and inclusive growth. According to Ramesh Chand,the agricultural economist, who has stated that despite farmers being the backbone of society, the government has constantly neglected the issues with respect to increasing farmer's income. Since 1969(Green Revolution) the Indian Government has focused on raising agricultural output and production. This involved

(a) an increase in productivity through improved technology and varieties, as well as an increased use of high-quality seed, fertiliser, irrigation, and agrochemicals;

(b) an incentive structure in the form of remunerative prices for some crops and subsidies on farm inputs;

(c) public investments in agriculture;

(d) facilitative institutions.

(e) infrastructure

Since the 1960's, there has been an increase of 45 percent in per person food production leading to self-sufficiency. But for most farmer's income has not increased. More than one-fifth of rural households with self-employment in agriculture as their primary occupation had income below the poverty line, according to the NSSO's Consumption Expenditure Survey data for 2011–12. The percentage of these farm households that were poor varied greatly between states (Fig 2).

  

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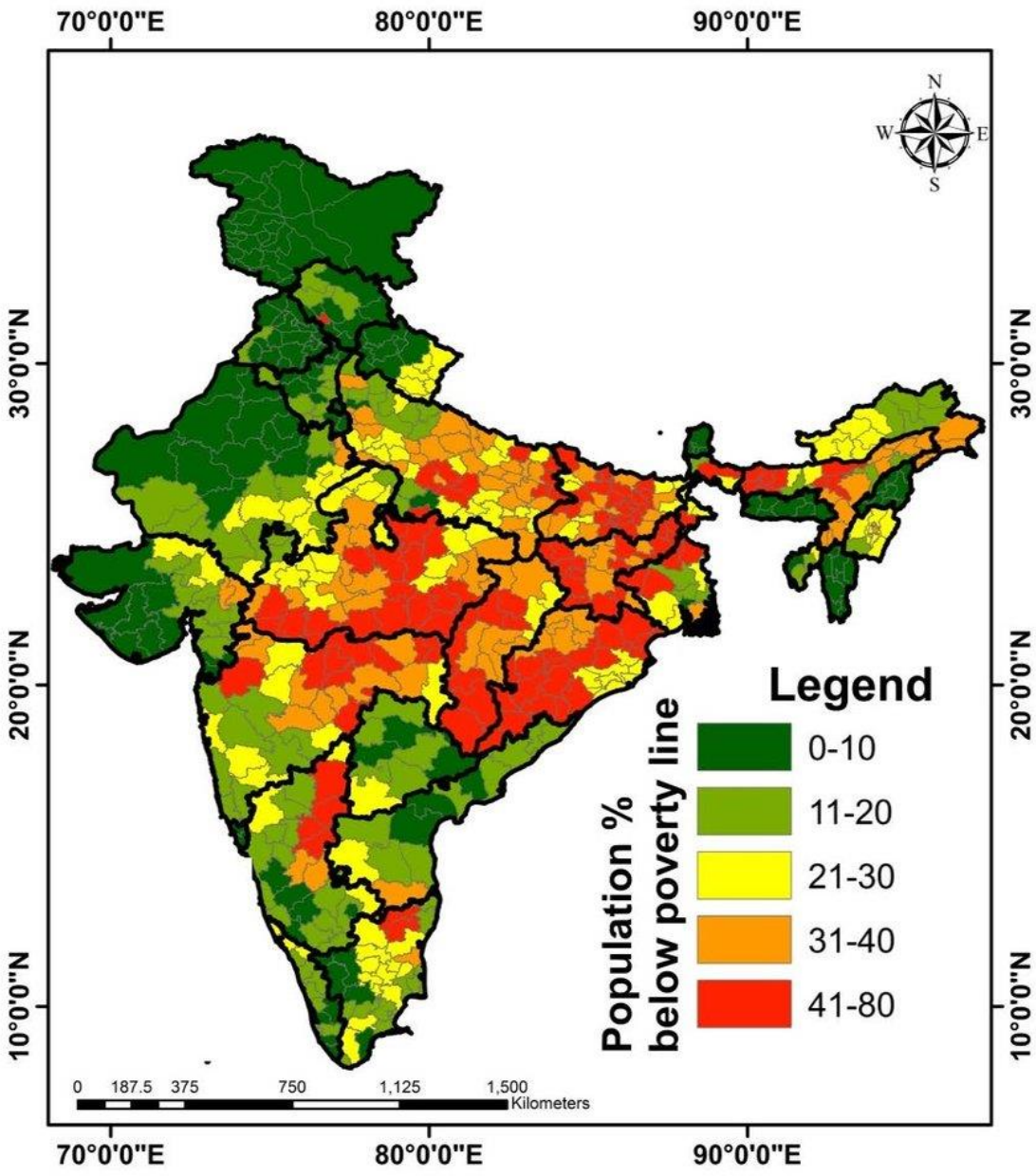
**Fig 2: District wise percentage of people living Below Poverty Line (BPL)**




Source: (Lewis, 2013)

The state of Jharkhand had the highest prevalence of poverty, with 45.3% of farm households living below the poverty line. Except for West Bengal, all eastern states were found to have fairly high rates of poverty among farm households. In Haryana, it was found that 4.3 percent of farmers were living below the poverty line. In Spite of the large population dependent on the

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agricultural sector there has been a wide gap between the earnings in this sector and the non agricultural sector. Farmer's in the 1980's earned 34 percent of what their counterparts earned in the non agricultural sector. This gap has widened and in 2004-2005 the non agricultural workers earned 4.08 times more than farmers. During this time period the suicide rate of farmer's has increased exponentially.

The National Commision on Farmers (NCF) has made two significant recommendations that would directly affect farmers' income:

(i) the prices farmers receive for their produce should be at least 50 percent more than the cost; and

(ii) agricultural labour should be included in the definition of farmer.

After Prime Minister Narendra Modi took upon himself to double the farmer's income by 2022 while speaking at a farmers rally in Bareilly, Uttar Pradesh, on February 28, 2015. This aspect started receiving a lot of attention.

**Figure 3: Farmer Suicide between 2015-2016**

**FARMERS' SUICIDES**

(includes those by farm labourers)

| | 2015 | 2016* | % Chg |
|---|---|---|---|
| Punjab | 124 | 271 | **118.0** |
| Haryana | 162 | 250 | **54.32** |
| Karnataka | 1,569 | 2,079 | **32.50** |
| Gujarat | 301 | 408 | **35.5** |
| Madhya Pradesh | 1,290 | 1,321 | **2.4** |
| Telangana | 1,400 | 645 | **-54.0** |
| Maharashtra | 4,291 | 3,661 | **-15.0** |
| Andhra Pradesh | 916 | 804 | **-12.2** |
| Chhattisgarh | 954 | 682 | **-28.5** |
| **Total** | **12,602** | **11,370** | **-9.8** |

Note: Total might not match as all states have not been included Source: Parliament questions

Source : Parliament Questions

  

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Numerous experts have characterised the objective as unattainable and impractical (Gulati and Saini, 2016). According to calculations made by some observers, agriculture will need a yearly growth of 14.86 percent per year for five years in order to double farmers' incomes in 2022. They also noted that this growth level has never been reached for even one year in the history of Indian agriculture. Thus increasing farmer's income would require a phenomenal increase in GDP growth of the economy. To achieve this dairy farming would require a boost both in terms of productivity so that it could contribute to the farmer's income and help the government in achieving its aim of doubling farmer's income.

This has led to a large amount of research with respect to dairy farming. In the process studies have indicated a large number of issues that are prevalent in this occupation.

## 3. Methodology

The methodology used in the analysis is a 'mixed method approach'. This includes the collection of primary data along with secondary data. Primary data was collected in the form of interviews, google sheet and questionnaire which was later tabulated. The statistics indicated some interesting theories. The collection of data from the farmers has helped in understanding the problem faced by them in the process of increasing their income. Secondary data indicated that the government in the past has focused more on increasing agricultural production and technological advancement with respect to a few crops in few parts of India. The Green Revolution aimed at wheat and rice cultivation in mainly Punjab, Haryana and parts of Western Uttar Pradesh. This restriction led to the concentration of a number of policies of the government catering to these crops which could be seen in the farmer agitation of 2020-2021, where a large number of farmers were from these above regions. Although the increase in production of food has led to an increase in export, as well as the increase in incomes of large farmers especially under the area under consideration. There have been a large number of farmer suicides from 2012 onwards. These have generally been the marginalised farmers who own less than three hectares of land. This section forms a majority of the farming population, implying that any policy of the government has to target this group. One of the policies that could be beneficial is increasing the income from dairy and cattle farming.

Primary data for Karnal district farmers was collected by interviewing them as well as using the questionnaire method to understand the level of incomes that could increase through dairy farming. The awareness of the knowledge of various government schemes were analysed. On the basis of the responses received from the respondents the following results emerged:

  

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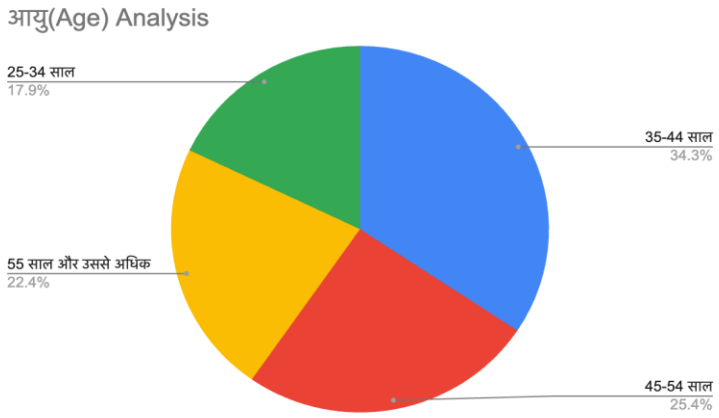
## 4. Analysis

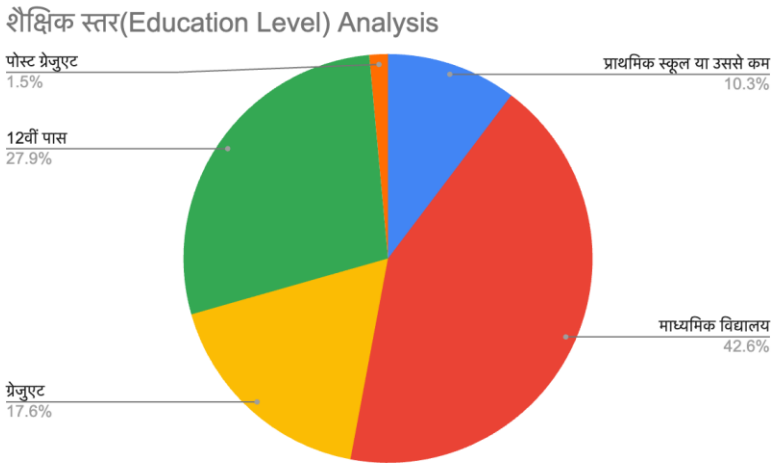
**Figure 1.1: Age analysis**




Source: Own source

The sample size ranged from 25 years to 55 years. Majority of the farmers were in the age group of 35 to 44 years and accounted for 34.3 percent of the farmers. The age group of 45-54 had 25.4 percent while 55 years and above were 22.4 percent while the youngest age group had the least percentage.

**Figure 1.2: Education levels**

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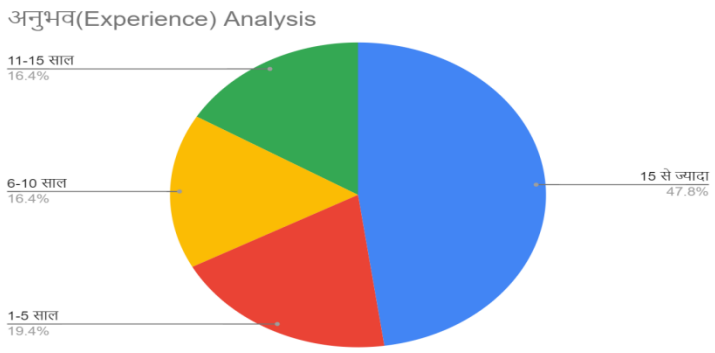
The level of education ranged from primary to post graduate. Majority of the farmers (70.5 percent) had completed 10th and 12th grades in school ,17.6 percent were graduates, 10.3 percent had only completed primary level education while 1.5 percent had finished their post graduation.

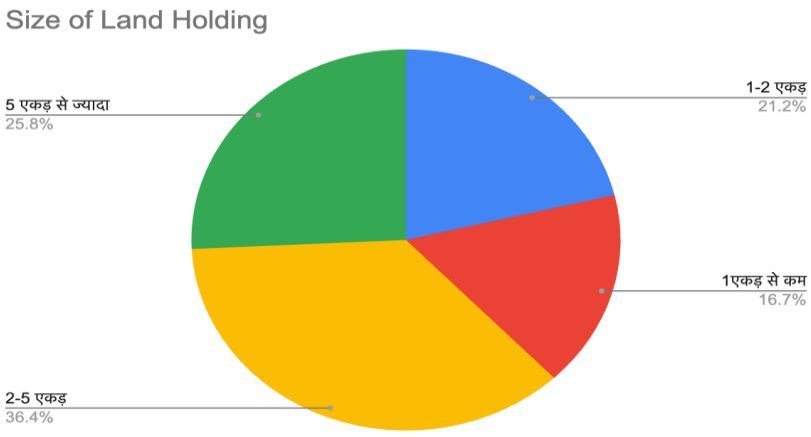
**Figure 1.3 - Measure of experience in number of years**




Source : Own source

47.8 percent of the farmers had an experience of more than 15 years while there was an almost equal division between the rest of the category with 19.4 percent with 1-5 years of experience, 16.4 percent had 6-10 years of experience and the rest (16.4 percent) of farmers were in the 11-15 years of experience.

**Figure 1.4 : Measurement of land holding in acres**




Source : Own source

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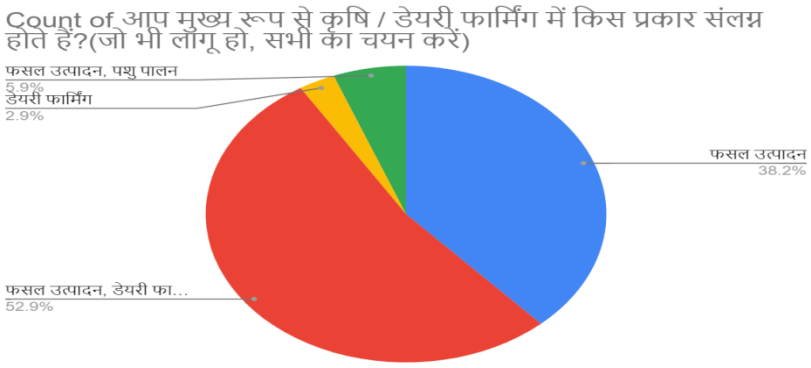
36.4 percent of the farmers owned between 2-5 acres of land, 25.8 percent of farmers had a land size of more than 5 acres , 21.2 percent owned between 1-2 acres of land and 16.7 percent of farmers owned less than 1 acre of land. The majority of the farmers thus owned less than 3 hectares of land.

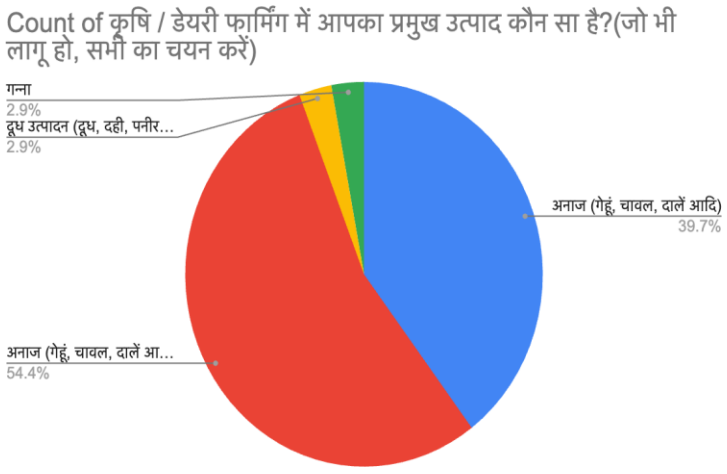
**Figure 1.5 : Measurement of land holding in acres**




Source : Own source

52.9 percent of farmers surveyed were engaged in Agricultural Farming together with dairy farming. Further, 38.2 percent if farmers are occupied in just the agricultural farming and do not deal in dairy farming while only 2.9 percent of farmers are exclusively dealing in dairy farming.

**Figure 1.6 - Crops the farmers mostly rely on**

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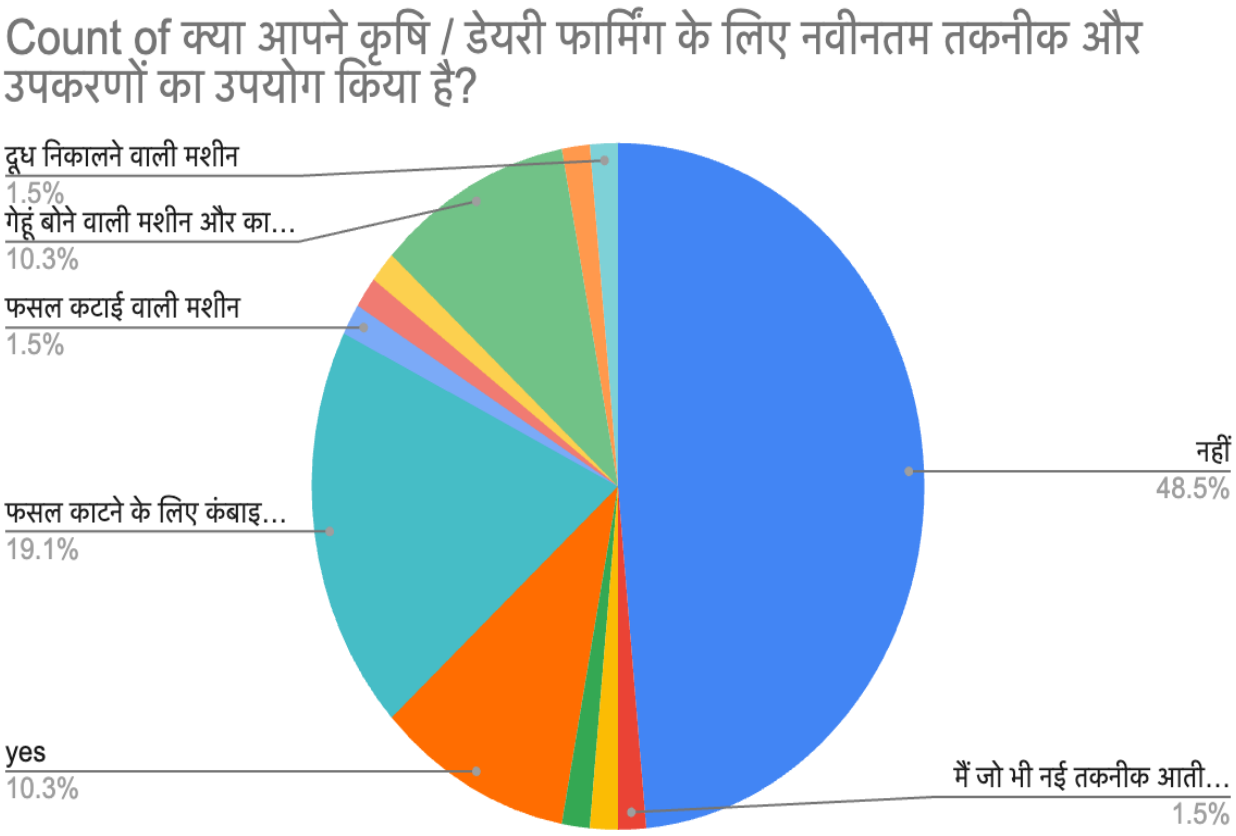
94.1 percent of farmers earned mostly from growing rice, ‘daal’ and wheat. The rest of the 2 categories were evenly divided with 2.9 percent of farmers depending on milk products i.e. milk, curd and cottage cheese(paneer) while the remaining 2.9 percent relied on sugarcane production. Though the graph indicates that only 2.9 percent of farmers solely rely on milk, all farmers in our survey were dependent on milk products in some way or the other whether for their own consumption or for selling in the local markets.

**Figure 1.7 - Use of modern technology in dairy farming**




Source : Own source

48.5 percent of the farmers did not use any machinery that could help them improve their efficiency, 51.5 percent used technology to improve their productivity. 51.5 percent - 32.4 percent of them used machines to cut their agricultural crops while 10.3 percent of them used machines but were unwilling to specify which ones. Amongst them only 1.5 percent kept up with the new technologies provided by the government.

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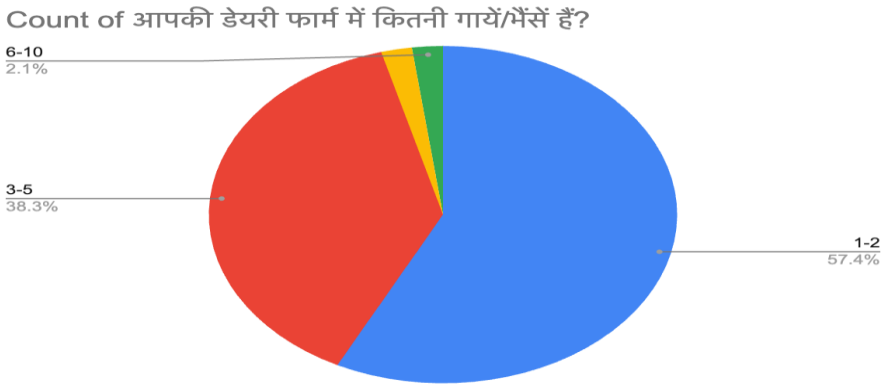
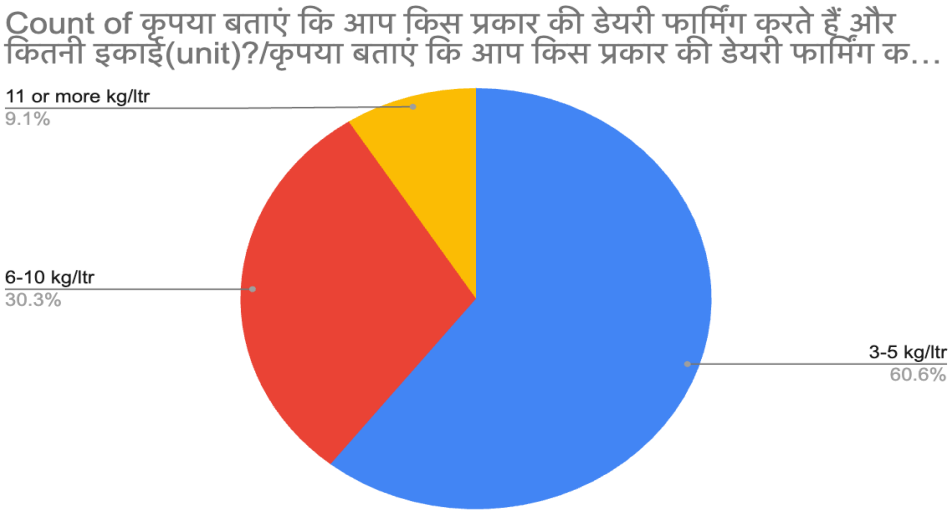
**Figure 1.8 : Count of cattle amongst the respondents**




Source : Own source

57.4 percent of the farmers had 1 or 2 cows, 38.3 percent of the farmers had 3-5 cows while the smallest category of 2.1 percent had between 6-10 cows. Thus majority of them owned the minimal amount which seemed just sufficient for their own use.

**Figure 1.9 : Analysis on the type of dairy farming (In terms of production of milk)**




Source : Own source

60.6 percent produced between 3-5 kg/ltr of milk per day, 30.3 percent of farmers produced 6-10 kg/ltr per day of milk and 9.1 percent of farmers produced 11 or more kg/ltr of milk.

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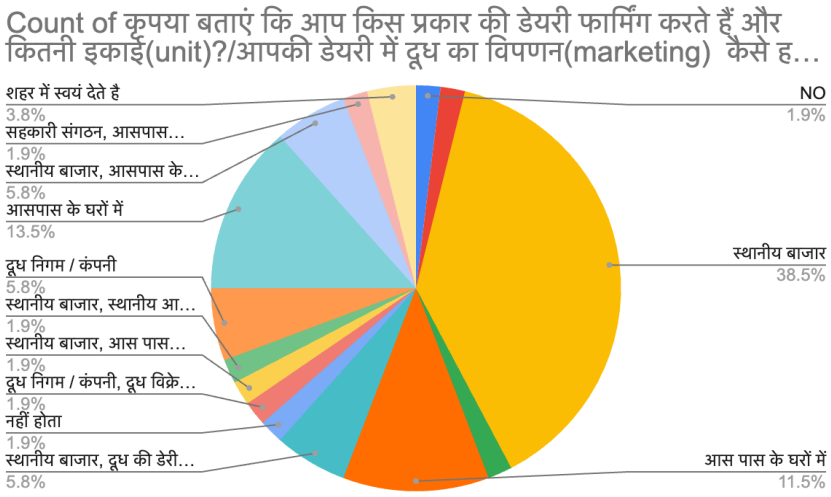
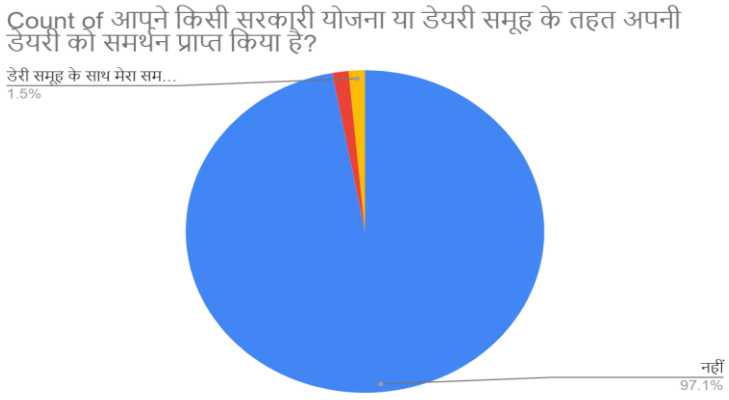
**Figure 1.10 : Marketing of milk produce**




Source : Own source

25 percent of farmers sold their product within their neighbourhood, 7.7 percent sold it to milk companies, 3.8 percent of the farmers distributed the milk themselves within the city while 3.8 percent did not sell the produce and used it for self consumption.

**Figure 1.11 : Role of Govt Schemes or dairy cooperatives**




Source : Own source

97.1 percent of farmers did not take any help from government schemes or the dairy cooperatives/associations to market their products to help in increase of income. Only 1.5

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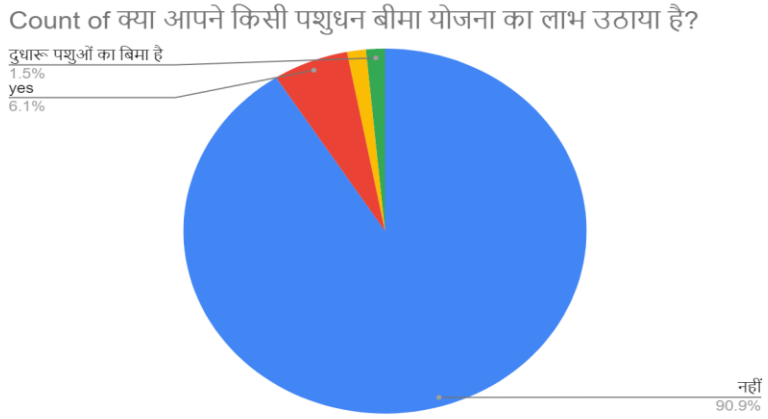
percent of people agreed to have taken some advantage of such schemes or associations. The possible reason for this is lack of awareness of schemes or insurance for all types and ages of farmers.

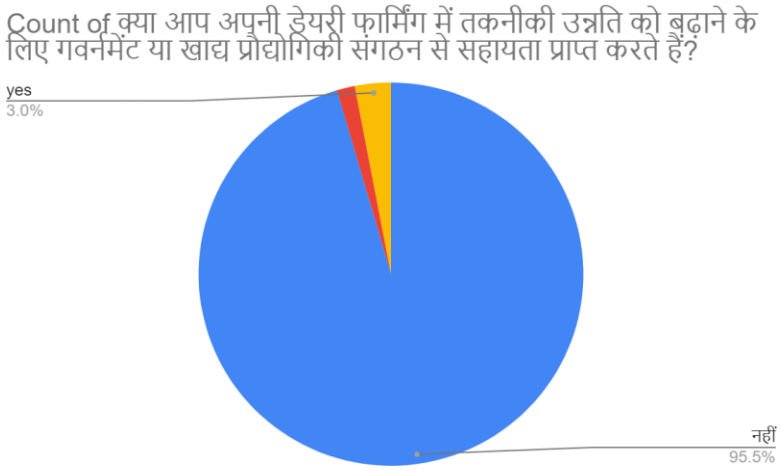
**Figure 1.12 : The prevalence of insurance programs.**




Source : Own source

The scheme was used by only 6 percent of the farmers. The reason again could be that they were not aware of any such aid that was available for farmers who nurtured cattle.

**Figure 1.13 : Role of Government in technological advancement**

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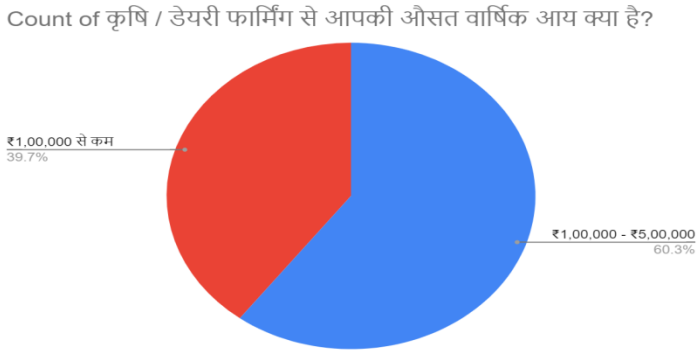
95.5 percent of people did not receive any help from the government or cooperative societies with respect to the technological advancements in dairy sectors. Only 3 percent of the respondents said that they adopted technological advancement that was made available to them by the government.

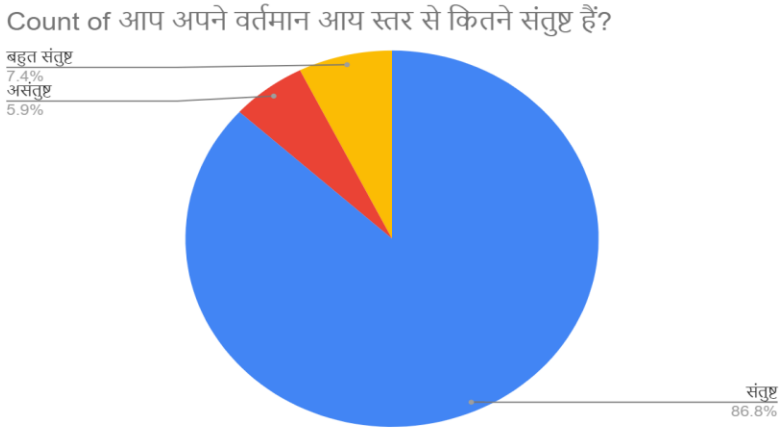
**Figure 1.14 : Annual Income of Farmers**




Source : Own source

Majority of the agricultural/dairy farmers annual income was in the slab of 1 Lakh- 5 Lakh rupees per year. 39.7 percent farmers mentioned that their income was below 1 Lakh rupees. In Haryana, ₹ 1.8 lakh is considered below-poverty-line(BPL) category as stated by the Chief Minister Manohar Lal Khattar(April 2021).

**Figure 1.15 :Satisfaction among farmers about their income**

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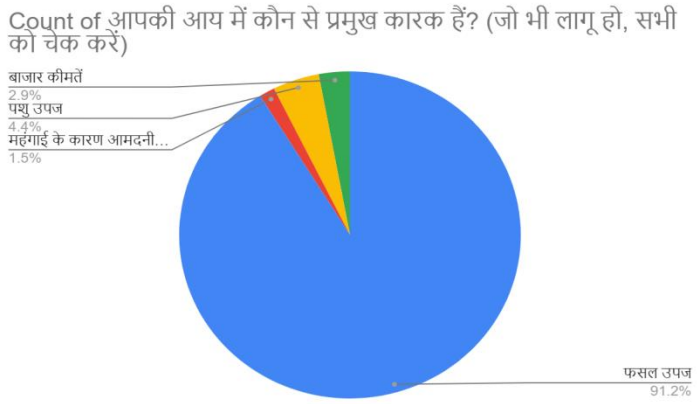
94.1 percent of the farmers were content with their current income levels. Only 5.9 percent farmers showed their dissatisfaction with their current income levels. These results may be incorrect as the farmers may not be very willing to disclose their true status.

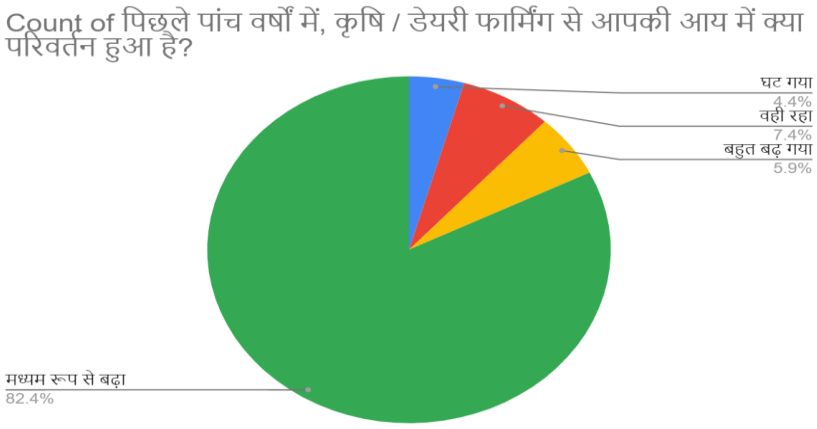
**Figure 1.16 :Major components that define their income**




Source : Own source

91.2 percent of the farmers said that the main challenges in increasing their income was ‘inadequate crop production’ while 4.4 percent mentioned ‘low dairy produce’ as the major challenge, 2.9 percent indicated ‘low market rates’ and the balance 1.5 percent blamed it on the ‘increasing raw material’s market prices’.

**Figure 1.17 :Trend of income in last 5 years**

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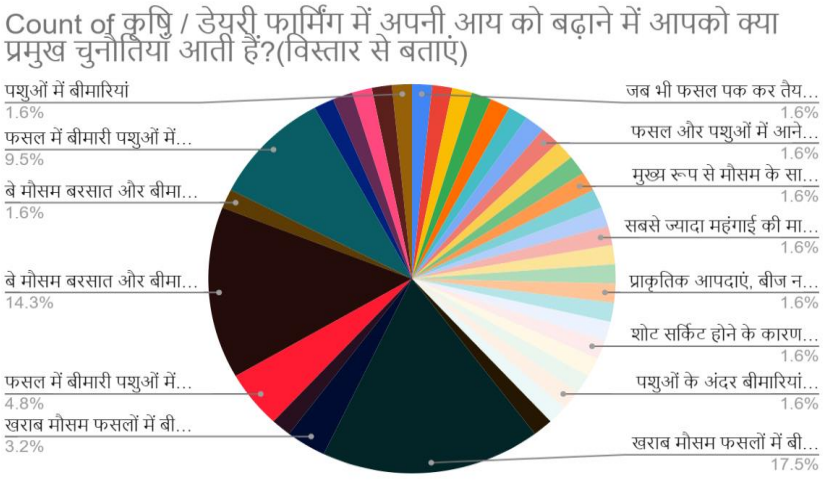
The majority of the farmers(82.4 percent) indicated a small increase in their income. Only 5.9 percent of the respondents seemed happy with their major increase in income in the last 5 years.

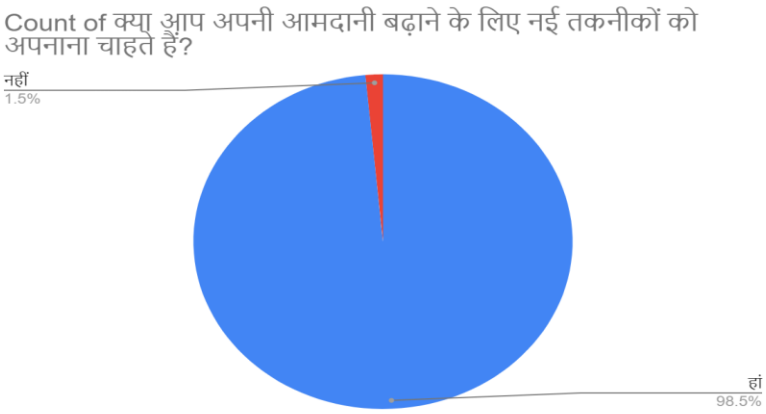
**Figure 1.18 :Challenges faced by farmers in increasing their income**




Source : Own source

41.4 percent of the respondents indicated that the reason for declining productivity was based on weather. A few of them indicated the diseases that attacked the cattle which led to decline in productivity.

**Figure 1.19 :Interest of farmers in adopting new technologies**

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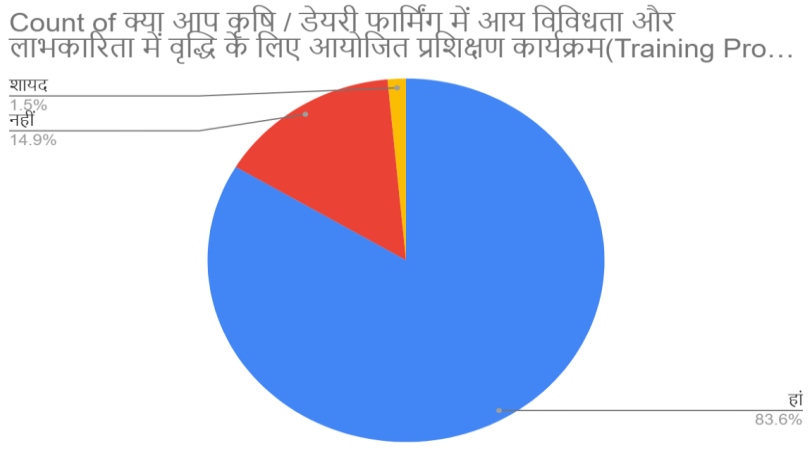
This question elicited maximum response and 98.8 farmers were willing to adopt new technologies as long as their productivity and income increases.

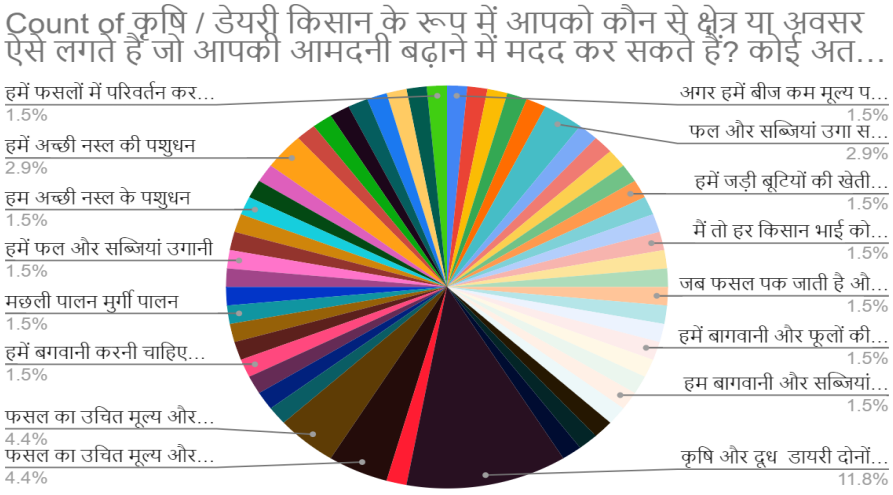
**Figure 1.20 :Interest of farmers towards training programs for adopting new technologies**




Source : Own source

The above percentages corroborate the earlier answer as 82.5 percent were ready to undergo training programs to adopt new technologies such that their income would increase.

**Figure 1.21 : Areas where farmers feel that the income can be increased**

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As the question elicited subjective answers , the main crux was that help was required in adoption in new technologies as well as higher government price for their products.

**Findings:**

According to the primary analysis, milk production formed an extremely small portion of the total earnings of farmers in Karnal. Considering that the National Dairy Research Institute(NDRI) is an important research institute which specialises in dairy farming the impact it has had on the incomes of the neighbourhood have been extremely negligible. The respondents were mainly concerned with an increase in their crop production due to the limited dependence on dairy products.

**Governments assistance with this particular sector**

The main goal of numerous initiatives started in the State has been to implement milk cooperatives designed after the Anand model. Under this system, the Milk Producers themselves are in charge of all dairy operations, including milk procurement, processing, and marketing. The milk producers societies at the village level, the milk producers cooperative union at the district level, and the state milk federation as the top body at the state level make up its three tier system.

On April 1, 1977, the Haryana Dairy Development Cooperative Federation Ltd. was established and registered under the Haryana Co-operative Societies Act. It has a Rs. 4000 lac authorised share capital. It was founded with the primary goal of advancing the economic interests of Haryana's milk producers, particularly those from disadvantaged groups within the village community, through the procurement, processing, and selling of milk and milk products either on its own or through its unions. The Federation engages in a number of actions to promote the VITA Brand for the Milk Unions' sales in order to further the aforementioned goals. Additionally, it provided technical assistance to the Unions in all areas of personnel, technical, marketing, and financial management. Subsequently, it increased their awareness of quality via the use of contemporary laboratory testing techniques. NDRI have also assembled a team where from time to time, they reach out to all the farmers in the area and share the new researchers. The research team discusses and informs them about new machinery that has come into market and about the seeds that are going to be released which would help them increase fodder yield. Moreover, they consult with the farmers addressing any issues that they might have while attempting to increase dairy produce .

The issues that have been raised are primarily with maintenance of cattle. There were five diseases that affected cattle and harmed the farmers economically-

- Haemorrhagic Septicaemia (HS),

  

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- Foot and Mouth Disease (FMD),
- Brucellosis,
- Peste des Petits Ruminants (PPR),
- Classical Swine Fever.

Nearly one lakh crore rupees have been spent by the Indian government and state governments on vaccination against these five diseases, but the country still loses income due to the fact that these:

- diseases were not reported,
- vaccines were of poor quality and ineffective,
- livestock farmers were not properly educated, etc.

There were 65242 veterinary institutions as of March 31, 2017. In order to ensure good veterinary health care, the National Commission on Agriculture (NCA)-1976 recommended that there should be one veterinary institution for every 5,000 cattle units (one cattle unit equals one cow, one buffalo, ten sheep, ten goats, five piglets, and one hundred chickens). In a similar vein, the Veterinary Council of India (VCI) has suggested that in order to provide effective veterinary services, there should be one veterinarian for every 5000 cattle. According to research, there are 67651 veterinarians in India, but the VCI estimates that they need between 1.1 and 1.2 lakh more (Damodaran, H. 2015). Poor and insufficient veterinary services were the cause of inadequate care to the cattle. Since the 1970s, India has embraced artificial insemination (AI) technology to improve the breed of cattle and, consequently, milk output. But due to the limitations indicated above, the average conception rate through artificial insemination (AI) has not exceeded 30–40 percent at the field level, and the share of milk produced by crossbred cows in overall milk production has not exceeded 26 percent.

The government has introduced **Animal Husbandry Infrastructure Development Fund (AHIDF).** Animal Husbandry Infrastructure Development Fund (AHIDF) which is a flagship scheme under the department of Animal Husbandry and Dairying, where INR 15,000 Cr has been set up for financial support to investors. It has offered:

- 3 percent interest subvention on loans,
- 2-year moratorium with 6-year repayment period,
- INR 750 Cr credit guarantee.

This amount is used for dairy processing infrastructures, value added product manufacturing and cattle feed plant setup.

  

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**Reasons for lower dependency on cattle farming**

The results indicate that although all farmers had cattles, only 2.9 percent of farmers were dependent on cattle farming. Some of the reasons for this could be that maintaining cattle is a very expensive and difficult task. Farmers could also face high financial loss due to animal diseases. According to estimates of direct losses based on the following reported diseases, Haemorrhagic Sepsis (HS), Foot and Mouth Disease (FMD), Brucellosis, Peste des Petits Ruminants (PPR), and Classical Swine Fever the average annual economic losses due to them was in, in, in, Rs. 2417 crores in 2016, and Rs. 429 crores in 2016. ?????

**Table 1 Loss of Revenue due to cattle diseases**

| Year | Loss of Revenue | |
|---|---|---|
| 2014 | Rs. 5255 crores | |
| 2015 | Rs. 20400 crores | |
| 2016 | Rs. 20000 crores | |

The five diseases mentioned above are completely preventable with vaccination. But due to lack of adequate implementation it has caused farmers in India to lose close to Rs. 50,000 crores in direct revenue annually.

Despite having only 2.29 percent of the world's surface area, India is home to roughly 17 percent of the world's people and 10.70 percent of the world's livestock (more than 535.82 million heads), placing enormous strain on the country's supply of land, water, and other resources. Only 5 percent of the nation's arable land is used for the production of feed and 3.30 percent of the entire area is covered by permanent pastures and grazing fields, and this percentage of land has been progressively decreasing. Crop leftovers are one of the several resources, this kind of animal feed satisfies more than half of the nation's demand for livestock. If animal productivity and production remain in a status quo position, the livestock industry will face a severe shortage of feed and fodder. The ICAR-Indian Grassland and Fodder Research Institute (IGFRI) has noted that in 2019 there was a deficit of 23.40 percent in the availability of dry fodder, 11.24 percent in green fodder, and 28.90 percent for concentrates in India in a report titled "Revisiting National Forage Demand and Availability Scenario" that was released in August 2019.

***Only around 12 percent of the overall public spending on agriculture and related sectors went into public institution support, which is significantly less than its share of the agricultural GDP.

  

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To hasten the commercialization of livestock production, market access is essential. Farmers may be discouraged from implementing more advanced technology and high-quality inputs due to a lack of market access. The livestock market does not alter consistently right now. Specific species or products are affected by the changes. But the dairy and poultry industries have seen incredible shifts from an informal to a formal market system. The involvement of the business sector is responsible for this. However, the unorganized sector sells around 60 percent of milk (DADF, 2018a). On the other hand, sheep, goat, and cattle meat continue to be produced informally and with little support from the corporate sector.

The provision of technical services to the animals, the provision of technical inputs, and the education of livestock farmers make up the three parts of the delivery of livestock services. Animal care services include vaccination, deworming, breeding, and disease control, all of which require technical inputs like vaccines, medications, semen, AI guns, syringes, and needles, among other things. For all of the aforementioned services and, to a certain extent, the supply of technical inputs, livestock farmers are forced to rely on veterinarians or para-vets. Sadly, the third element—educating livestock farmers on many facets of livestock management—is utterly ignored. These include nutrition, immunisation, disease control, breeding, etc. The notion that "educating farmers is the core of livestock extension service" (Rao, SVN. 2013) is frequently disregarded in favour of the provision of inputs and rendering of services as extension services. Any extension services should put an emphasis on enhancing farmers' capacity to care for their livestock and crops in addition to transferring technologies and bolstering various infrastructure and support services.

**Conclusion**

The survey indicated that there were many problems faced by Karnal farmers . Important among them is the lack of infrastructure. The situation has improved with the help of NDRI as this institution is working towards increasing the knowledge amongst the farmers with respect to new technologies both for crops as well as dairy production. The fact that the institution is in Karnal, makes it easier for these farmers to access and understand the new methods that need to be adopted to increase their productivity. Any issues that they face are easily addressed due to the prevalence of the institute. Given the above fact cattle breeders are willing to go an extra mile in adopting better and newer technology such that they would be in a position to double their farm income with the help of both cattle and crop. There are various NGOs and private initiatives that have developed in this area to address serious issues being faced by the farmers. Among them is Gurbachan Singh Foundation for Research Education and Development (GSFRED).As the main issues that the respondents faced were lack of knowledge of various government initiatives and subsidy schemes with respect to dairy farming. Concerted effort has to be made on all fronts that

  

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are government, private, NGOs as well as public and private initiatives to address this issue such that the aim of the government to 'double farmer income' can become a reality.

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# Appendix

## Appendix 1- Questionnaire

**Farmer's Questionnaire(Hindi)**

**Farmer's Questionnaire(English)**

**Farmer's Questionnaire(Hindi)-Google Forms**

**Appendix 2 - Results**

Responses of Farmer's Questionnaire

**Appendix 3- Photographs & Videos connected to the Research**

Face to face interaction with the farmer's-Video 1

Face to face interaction with the farmer's-Video 2

Face to face interaction with the farmer's-Video 3

Face to face interaction with the farmer's-Video 4

Face to face interaction with the farmer's-Video 5

Face to face interaction with the farmer's-Video 6

Face to face interaction with the farmer's-Video 7

Visit to Dairy Farm & Interaction

**A day at Cattle Farm**

Video 1

Video 2

Video 3

**A visit at Dairy Farm**

Video 1

Video 2

  