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EVALUATING HARYANA FARMERS' KNOWLEDGE AND VIEWS ON DOUBLING FARM INCOME BY 2022

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Abstract

As technology continues to advance, the field of veterinary medicine is experiencing a paradigm shift, with numerous groundbreaking innovations and therapies emerging. This article delves into an in-depth discussion of these developments, emphasizing advancements in areas such as stem cell therapy, fiber optic technology, anesthesia and anesthetic monitoring, and laser surgery. The clinical application of stem cells in veterinary medicine is still in its nascent stages, but it is already redefining the concept of healing in various animal species. The incorporation of fiber optic technology in diagnostics has been one of the most thrilling advancements in the field. Moreover, Alfaxalone, the latest anesthetic induction agent approved by the FDA, and surgical lasers have noticeably improved operating room experiences. This review provides a concise overview of these essential innovations, as well as other emerging therapies that are consistently enhancing the health and longevity of animals.

Introduction

The agriculture sector plays a pivotal role in the Indian economy, contributing to food security, employment, and overall development. With the increase in population and the demand for food, it has become imperative to improve agricultural productivity and farmers' income in India. In 2016, the Indian Government announced an ambitious plan to double farmers' income by 2022, focusing on various measures such as increasing agricultural productivity, risk mitigation, and market reforms (Chand, 2017). The state of Haryana has a significant agrarian economy, with agriculture contributing about 18.2% of the state's Gross State Value Added (GSVA) in 2019-20 (Haryana Economic Survey, 2020). However, the state's agricultural growth has been stagnating, and the farmers' income has remained low compared to other sectors (Kumar et al., 2018). This paper aims to evaluate the knowledge and views of Haryana farmers on the government's plan to double their income by 2022, based on an extensive review of the literature and empirical analysis. The Haryana farmers' knowledge and views on doubling farm income by 2022 are crucial for assessing the feasibility and effectiveness of government policies and strategies. Previous studies on farmers' perception, awareness, and adoption of new technology and practices have

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highlighted the importance of farmers' knowledge in achieving sustainable agricultural development (Daberkow & McBride, 2003; Kassie et al., 2013). Moreover, farmers' views on government policies and initiatives can provide valuable insights into the acceptability and potential impact of these measures on their income and livelihood (Jat et al., 2014; Meena et al., 2018). The concept of doubling farm income by 2022 has gained significant attention in recent years, with researchers and policymakers exploring various aspects such as income measurement, determinants of income growth, and strategies for achieving the target (Chand, 2017; Chand et al., 2018). Some studies have assessed the farmers' knowledge and views on specific measures and interventions, such as crop diversification, soil health card scheme, and Pradhan Mantri Fasal Bima Yojana (PMFBY) (Dagar et al., 2017; Jat et al., 2014; Meena et al., 2018). However, a comprehensive evaluation of Haryana farmers' knowledge and views on the overall goal of doubling farm income by 2022 is still lacking in the literature. This paper addresses this research gap by conducting a systematic review of relevant articles on Google Scholar, focusing on the keywords "Haryana", "farmers", "knowledge", "views", "doubling farm income", and "2022". The review identifies the key factors influencing Haryana farmers' knowledge and views on doubling farm income by 2022, as well as the challenges and opportunities in achieving this target. The findings of this review can contribute to the ongoing policy debate and inform the design and implementation of targeted interventions to improve farmers' income and livelihood in Haryana. One of the critical factors influencing Haryana farmers' knowledge and views on doubling farm income by 2022 is their access to information and extension services. Adequate exposure to agricultural information and extension services can enhance farmers' knowledge of new technologies, practices, and policies, leading to better decision-making and higher farm income (Feder et al., 2004; Swanson, 2008). However, several studies have pointed out the limited access and low quality of agricultural extension services in Haryana, particularly in terms of coverage, staff competency, and farmer-oriented approach (Bhattacharjee et al., 2018; Chauhan et al., 2016). This situation can hamper the farmers' ability to understand and adopt the government's measures for doubling farm income by 2022. Another significant factor affecting Haryana farmers' knowledge and views on doubling farm income by 2022 is their socio-economic and demographic characteristics. Research has shown that farmers' age, education, landholding size, and social capital are critical determinants of their knowledge, perception, and adoption of new technologies and practices (Daberkow & McBride, 2003; Kassie et al., 2013). Specifically, younger and more educated farmers, as well as those with larger landholdings and better social networks, are more likely to have higher knowledge and positive views on government initiatives and income-enhancing measures (Kumar et al., 2018; Meena et al., 2018). Understanding these factors can help policymakers and practitioners design more inclusive and effective interventions for doubling farm income in Haryana. In conclusion, the paper provides a comprehensive evaluation of Haryana farmers' knowledge and views on doubling farm income by 2022, based on an extensive review of the literature and empirical analysis. The findings reveal the critical role of access to information and extension services, as well as socio-economic and demographic factors, in shaping the farmers' knowledge and views on this ambitious goal. Addressing these factors and enhancing farmers' capacity to adopt new technologies and practices, as well as improving the effectiveness and acceptability of government policies and initiatives, are crucial for achieving the target of doubling farm income in Haryana by 2022. Further research is needed to examine the actual impact of these measures on farmers' income and livelihood, as well as to identify innovative and context-specific solutions for sustainable agricultural development in the state.

METHODOLOGY

The study was conducted in Haryana state comprising of 22 districts and out of these Hisar and Fatehabad district were selected randomly. Five villages from each district namely; Sarsod, Bichpuri, Behbalpur, Badonpatti and

Dhansu of Hisar district and Dangra, JandliKalan, Chandrawal, Hasanga and Gorakhpur of Fatehabad district were selected randomly. Out of these ten villages, 10 farmers from each village (50 farmers from each district) were selected randomly to make the sample size of 100 farmers/respondents for the present study. The data was collected with the help of well-structured interview schedule prepared for this purpose. The suitable statistical tools like mean, frequency, percentage, weighted mean score and rank order were applied to draw meaningful results.

RESULTS & DISCUSSION

Socio-Economic Profile of Respondents:

The data regarding socio-economic profile of the respondents (Age, Education, Land holding, Farm implements, Irrigation facilities, Farming systems, Cropping pattern & Crop rotation, Mass media exposure and Extension contact) were collected and analyzed as under:

Table 1: Personal profile of respondents ***N= 100***

Sr. No.	Variables	Category	Percentage
1.	Age	Young (up to 30)	28.00
		Middle(31-50 years)	58.00
		Old (51 and above)	14.00
2	Education	Illiterate	06.00
		Primary	12.00
		Middle	18.00
		Matriculation	32.00
		Higher secondary	24.00
		Graduate	06.00
		Post graduate	02.00
3.	Land holding	Landless	00.00
		Less than 1 acre	06.00
		Above 1 and up to 5 acres	42.00
		Above 5 and up to 10 acres	36.00
		Above 10 to 15 acres	12.00
		Above 15 acres	04.00

1. Personal profile of respondents

The data presented in table 1 revealed that more than half of the respondents (58.00%) belonged to the middle age group (31-50 years) followed by young (up to 30 years) to the extent of 28.00 per cent. The remaining 14.00 per cent of the respondents belonged to old age group (51 years and above) to the extent of 23.00 per cent.

The data also reported that about one-third of respondents (32.00%) were educated up to matric followed by higher secondary (24%), middle (18%), primary (12%) and graduate (6%) level of education. Only 2.00 per cent of the respondents were educated up to post graduate.

As for as land holding of respondents is concerned, maximum respondents i.e. 48.00 per cent were having land up to 5 acres. About one-third of the respondents (36.00%) were having land holding ranged from 5 to10 acres. The remaining 16.00 per cent respondents possess land holding more than 10 acres.

Table 2: Farm implements ***N=100***

Sr. No.	Farm implements	Percentage
1	Tractor	38.00
2	Harrow	36.00
3	Cultivator	32.00
4	Seed cum fertilizer drill	28.00
5	Laser land leveler	04.00
6	Combine harvester	02.00
7	Puddler	12.00
8	Rotavator	24.00
9	Happy seeder	04.00
10	Sprayer (Knap Sack)	88.00
11	Tractor mounted spray pump	24.00
12	Straw Reaper	06.00

2. Farm Implements:

The data in table 2 represents that about one-third of the respondents (38.00 %) had tractor followed by harrow (36.00 %), cultivator (32.00%), seed cum fertilizer drill (28.00 %), rotavator (24.00%), tractor mounted spray pump (24.00%), puddler (12.00%), respectively.

The table 2 also showed that very little percentage of respondents had happy seeder (4.00%), straw reaper (6.00%), laser land leveler (4.00%) and combine harvester (2.00%) using on their farm. majority (88%) of respondents are having knap-sack sprayer at their farm.

Table 3: Irrigation facilities ***N=100***

Sr. No.	Modes of irrigation	Percentage(s)
1.	Submersible pump	56.00
2.	Tube Well	38.00
3.	Canal	85.00

3. Irrigation Facilities:

The data in table 3 revealed that more than half of the respondents (56.00%) had irrigation facilities of submersible pump followed by tube well (38.00%). A total of 85.00 per cent of the farmers were having canal water irrigation facility.

Table 4: Farming System ***N=100***

Sr. No.	Farming system	Percentage(s)
1	Livestock	88.00
2	Bee keeping	04.00
3	Agro-Forestry	08.00

4	Organic farming	03.00
5	Mushroom cultivation	02.00
6	Polyhouse vegetable production	04.00
7	Integrated farming system	02.00

4. Farming System:

The data in table 4 revealed that majority of respondents (88.00%) were doing livestock practices followed by agro-forestry (8.00%), bee keeping (4.00%), playhouse vegetable production (4.00%), organic farming (3.00%), integrated farming system (2.00%) and mushroom cultivation (2.00%), respectively in their farming system.

Table 5: Cropping Pattern and crop rotation ***N=100***

Farming system	Percentage	Crop rotation	Percentage
Multiple cropping	100.00	Paddy-Wheat	48.00
		Cotton-Wheat	30.00
		Wheat-Summer moong-Paddy	08.00
		Bajra/Guar/Jowar-Mustard/Wheat	12.00
		Paddy-other crops (Veg.)	02.00

5. Cropping Pattern and Crop Rotation

The data in table 5 indicated that all the respondents (100.00%) using multiple cropping system at their farms. As for as crop rotation is concerned, about half of the respondents (48.00%) had paddy-wheat crop rotation followed by cotton-wheat (30.00%), bajra/guar/jowar/mustard/wheat (12.00%) and wheat-summer moong-paddy (08.00%), respectively. Only 2.00 per cent of the respondents were using paddy-other crops (veg. crops) at their farms.

Table 6: Mass Media Exposure ***N=100***

Sr. No.	Mass media	Used (%)	Extent of utilization			Total score	Weighted mean score	Rank order
			Daily (3)	Often (2)	Sometimes (1)			
1	Radio	40.00	04 (12)	20(40)	16(16)	68	0.68	III
2	TV	78.00	34 (102)	22 (44)	22 (22)	168	1.68	I
3	Newspaper	40.00	23 (69)	15(30)	02(2)	101	1.01	II
4	Magazines	10.00	02 (6)	06 (12)	02 (2)	20	0.20	V
5	KisanSewa Kendra	06.00	02 (6)	03(6)	01 (1)	13	0.13	VI
6.	Online solution	14.00	05 (15)	06 (12)	03 (3)	30	0.30	IV

6. Mass media Exposure:

It is indicated from the table 6 that viewing of Television ranked first with weighted mean score of 1.68 followed by reading newspaper ranked second, listening radio ranked third, online solution ranked fourth, reading magazines ranked fifth and visit of Kisan Sewa Kendra ranked sixth with weighted mean score of 1.01, 0.68, 0.30, 0.20 and 0.13, respectively for seeking information.

7. Extension contact:

It is revealed from the table 7 that among the extension contact of farmers, the most popular were the progressive farmers with weighted mean score 2.25. ADO and SDAO/SMS ranked second and third with weighted mean

score of 2.02 and 1.58, followed by scientists and others ranked at fourth and fifth with weighted mean score 1.24, 0.94, respectively.

Table 7: Extension contact ***N=100***

Sr. No.	Extension Official	Frequency of contact				Total score	Weighted mean score	Rank order
		Weekly (4)	Fortnightly (3)	Monthly (2)	Whenever Needed (1)			
1	ADO	15 (60)	20(60)	22(44)	38 (38)	202	2.02	II
2	SDAO/SMS	8 (32)	18 (54)	10(20)	52(52)	158	1.58	III
3	Scientists	8 (32)	12(36)	06(12)	44(44)	124	1.24	IV
4	Progressive farmers	26(104)	15(45)	19(38)	38(38)	225	2.25	I
5	Others	02(8)	4(12)	6(12)	62 (62)	94	0.94	V

FARMERS' AWARENESS FOR DOUBLING THEIR FARM INCOME:

Farmers' awareness was assessed about the various schemes/ technologies which are supposed to double the income of their farm and data so obtained has been presented in table 8 indicates that majority (more than 60%) of the sampled farmers were aware about MSP of crops, timely procurement of produce by government at MSP, crop diversification, efficient irrigation systems, high yielding seeds, Resource conservation technologies (Zero Tillage , Laser land levelling), weather forecasting, service registration, soil water testing, PMFBY, income generating activities (beekeeping, mushroom, dairying, poultry and fisheries etc) and Kisan Credit Card facility are helpful to double the farm income. However, Majority of the respondents were not aware that nano technology in agriculture, use of GIS techniques, vertical cropping of vegetables, artificial intelligence techniques, precision farming, public private partnership (PPP) and climate resilient techniques can help in doubling the farm income. Therefore, there is need to create awareness among farmers about these technologies.

Table 8: Farmers' Awareness for Doubling their Farm Income ***N=100***

Sr. No.	Statements	Degree of Awareness	
		Aware	Not aware
		Percentage	Percentage
1.	Awareness about Minimum Support Price (MSP)	82.00	18.00
2.	Procurement of produce at MSP	78.00	22.00
3.	Bhawantra Bharpai Yojana	28.00	72.00
4.	Crop Diversification	66.00	34.00
5.	Efficient irrigation systems	68.00	32.00
6.	Protected cultivation	44.00	56.00
7.	High Yielding Seeds	78.00	22.00
8.	RCTs like Zero tillage, LLL etc.	82.00	18.00
9.	Weather forecasting services registration	68.00	32.00
10.	Soil-Water testing	56.00	44.00
11.	Soil health card	44.00	56.00
12.	PMFBY	88.00	12.00
13.	PMKSY (Per Drop More Crop)	36.00	64.00
14.	Shifting to high valued crops	34.00	66.00

15.	Access of information from all resources	42.00	58.00
16	Climate Resilient Techniques/practices	28.00	72.00
17.	ICT including social media like SMS, WhatsApp, m-Kisan Portal, Agri Mobile Apps etc.	43.00	57.00
18.	Public Private Partnership (PPP)	23.00	77.00
19.	Precision Farming	19.00	81.00
20.	Artificial Intelligence Techniques	16.00	84.00
21.	Smart Phone for information and feedback	43.00	57.00
22.	Vertical cropping of vegetables	12.00	88.00
23.	Use of GIS techniques	18.00	82.00
24.	Nano technology in Agriculture	0.00	100.00
25.	Income generating activities like Beekeeping, Mushroom cultivation, dairying, Fish farming/ Poultry along with agriculture	70.00	30.00
26.	Kisan Credit Card	94.00	06.00

PERCEPTION OF FARMERS FOR DOUBLING THEIR FARM INCOME

The data regarding perception of farmers for doubling their farm income in table 9 indicated that a vast majority of the respondents (more than 90.00%) perceived that increase in MSP and timely procurement of produce by government will increase their income. 68.00 percent of the respondents perceived that Bhavnagar Bharpai Yojana should be expended for other crops also. Majority of the respondents had perception that crop diversification, efficient irrigation systems, adoption of RCTs, weather based crop plan, availability of high yielding seeds, soil-water test based crop management, PMFBY, PMKSY, facility of KCC at minimum interest rates, integration of income generation activities (beekeeping, mushroom, dairying, fishery) with agriculture, transfer of technologies through kisan mela/goshthies/trainings/field days can increase the income of their farm. The respondents were also agreed that recycling of agri-waste, facilities of processing and value addition, access to information at right time, use of ICTs (SMS, Facebook, Whatsapp, Agri-Mobile App) and protected cultivation can help to increase the income of their far. More than half of the respondents were not agreed that use of nano technologies in agriculture, motivating farmers for use of smart phones, artificial intelligence techniques, precision farming, public private partnership and climate resilient techniques can increase their farm income

Table 9: Perception of Farmers for Doubling Their Farm Income N=100

Sr. No.	**Statements**	**Degree of Perception (%)**	
		Agree	**Disagree**
1.	Increase in Minimum Support Price for crop produce	96.00	04.00
2.	Timely Procurement of produce by Government at MSP	94.00	06.00
3.	BhawantraBharpaiYojana for other crops also	68.00	32.00
4.	Crop Diversification will help in increasing farm income	72.00	28.00
5.	Efficient Irrigation systems by adopting LLL	56.00	44.00
6.	Protected cultivation will increased farm income	48.00	52.00
7.	Availability of High Yielding Seeds	76.00	24.00
8.	Adoption of RCTs like Zero tillage, LLL etc.	58.00	42.00
9.	Weather forecast based crop plan helps to increase farm income	68.00	32.00
10.	Soil-Water test based crop management helps to increase farm income	65.00	35.00
11.	PradhanMantriFasalBeema Yojana (PMFBY) for all crops to minimize risks	72.00	28.00
12.	PradhanMantriKrishiSinchai Yojana (PMKSY)- Per Drop More Crop to cover in more area under cultivation	84.00	16.00
13.	Timely availability of inputs will increase farm value	68.00	32.00

14.	Shifting to high value crops	58.00	42.00
15.	Access of information at right time	74.00	26.00
16.	Application of Climate Resilient Techniques	46.00	54.00
17.	Use of ICT like SMS, Face book, WhatsApp, Agri Mobile App	45.00	55.00
18.	Participation in Public Private Partnership (PPP)	38.00	62.00
19.	Precision Farming	26.00	74.00
20.	Use of Artificial Intelligence Techniques/ practices	24.00	76.00
21.	Effective transfer of technologies through KisanMelas/KisanGoshthies/Trainings,/Field days etc.	54.00	46.00
22.	Motivating farmers for use of Smart Phone for access information and feedback	36.00	64.00
23.	Cultivation of Vertical cropping of vegetables	26.00	74.00
24.	Use of Geographical Information System (GIS) techniques in agriculture	32.00	68.00
25.	Use of Nano-technology in agriculture	0.00	100.00
26.	Income generating activities like Beekeeping, Mushroom cultivation, Dairying, Fish farming/Poultry along with agriculture	64.00	36.00
27.	Facility of Kisan Credit Card at minimum interest rates	94.00	06.00
28.	Formation of commodity based Farmer Interest Group (FIG) and farmer Producer Organization (FPO) will help to increase farm income	48.00	52.00
29.	Recycling of agri- wastes	62.00	38.00
30.	Ware housing facilities at local level	42.00	58.00
31.	Facilitating for crop produce processing and value addition facilities	53.00	47.00

CONCLUSIONS

On the basis of above findings it is concluded that majority of the sampled farmers were aware about the initiatives like MSP of crops, timely procurement of produce by government at MSP, crop diversification, efficient irrigation systems, high yielding seeds and Kisan Credit Card facility taken up by government and helpful to double the farm income. They were viewed that climate resilient techniques can help in doubling the farm income. The data regarding perception of farmers for doubling their farm income indicated that a vast majority of the respondents (>90.00%) perceived that increase in MSP and timely procurement of produce by government will increase their income. 68.00 percent of the respondents perceived that Bhavnagar Bharpai Yojana should be expended for other crops also.PMFBY, PMKSY, facility of KCC at minimum interest rates, integration of income generation activities (beekeeping, mushroom, dairying, fishery) with agriculture are some of the schemes and technologies about which farmers perceived that they are helpful in increasing their farm income. Therefore it is suggested that these schemes and activities should be popularised and trainings for farmers on income generating activities like beekeeping, mushroom etc. be organised so that farmers can enhance their farm income.

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