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Suitable strategies for uplifting the farmers income of Koppal districts in Karnataka

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Abstract

Agriculture development in India has been viewed large in the context of increasing the output rather than welfare of the farmers. In the recent past, the sector has been facing regular distress and crisis posing a severe threat to peasants in practicing agriculture as a main source of livelihood. Under this perspective increasing the farmers income by shifting the focus from agricultural output and food security to income security is most important aspect. For this context, ICAR-Krishi Vigyan Kendra, Koppal has conducted study and selected and surveyed 111 farmers in different villages of Koppal district during 2016-17. Further KVK has collected the improvement data of family income after 4 years of technology adoption by the farmers in 2020-21. Based on the survey along with technological adoption it was concluded that, average income of farm households, before and after the interventions, more than 2.63 times between 2016-17 and 2020-21. Farmers from all land classes benefitted from the technical interventions. Further, the households at the bottom of land distribution benefitted relatively more. Marginal and small farm households were benefited by 3.7 and 3.1 times increased income, respectively. The medium and large farm households could realize 3.2 times increase in their household income during 2020-21 as compared to 2016-17.

Keywords: Koppal, technologies, survey, income security, uplifting

Introduction

A firm bonding between farmers and agriculture occurred when cultivation started on the earth, beginning of agriculture was concentrated for self-feeding, as the population started increasing farmers began barter system to full fill their needs. In India during 1960 where there was scarcity of food occurred, the technologies were developed for self-sustained food production and secured self-sufficiency (Ramesh Chanda 2017) [2]. Nowadays agriculture trade has massive development in all over the countries. Agriculture dependency in India is nearly 70%. As it contributed 17% to Indian GDPs and employs about 58% of population and it makes India's employer sector. Agriculture is one of the very critical sectors of Indian economy and centre for socio-economic development. For socio-economic development in any sectors income is the prime kye. In agriculture sector income is crucial for maintaining the socio-economic balance the reason behind is majority of agriculture dependency by small and marginal farmers improving the income this category of people has to be the top priority. 82 % of agriculture is done by small and marginal farmers. In agriculture development measures like policies, reforms, development programmes and schemes play important role in increasing the income of farmers. Adoption of different farming models are very important to uplift the farmers income.

Koppal, a new born district of Karnataka state has a total of 4.18 lakhs holdings spread across 5.52 lakh hectares of the operated area with average land holding of 1.75 ha. It consists of seven talukas *viz.*, Koppal, Gangavathi, Kushtagi, Yelburga, Kanakagiri, Karatagi and Kukanoor. Marginal and Small farmers account for 69.89 per cent of the total holdings operating 38.16 per cent of the total cultivated area. The gross cropped area was 4.33 lakh hectares. Out of 3.95 lakh hectares of net area sown, the net irrigated area was 18.01 per cent. Food crops accounted for 23.78 per cent of the gross cropped area. Cereals accounted for 53.89 per cent of the gross cropped area, where as the share of pulses was 41.88 per cent and that of oilseeds was 15.83 per cent. Among cereals, Maize accounted for the largest area of 19.82 per cent, followed by Paddy 17.38 per cent, Pearl millet by 8.88 per cent and Sorghum 5.99 per cent. Koppal district is contributing 10.30 % of state paddy production alone and consider as a rice bowl of Karnataka. In terms of percentage share of the irrigated area to the total area, Paddy accounted for the highest share followed by Sugarcane. Koppal is the one of the leading district for Horticulture crops with an area of 0.42 lakh hectare and 39.67 per cent of total cultivable area. Out of which 73.08 per cent area under vegetables, 21.78 per cent area user fruits, 2.48 per cent area under plantation, 2.05 per cent area under flowers and 0.55 per cent area under spices. The total value of horticulture produce was worth Rs. 52826.5 lakhs during 2019-20. Koppal also rich in livestock with 2.60 lakh cattle, 0.77 lakh buffalo, 1.56 lakh goats, 5.47 lakh sheep and 35.34 lakh poultry birds. The state produces 144494 tonnes of milk, 14626 lakh eggs and 5301 tonnes of meat annually.

KVK was established during 2004 with 7 technical staff to address the problems of farming community. KVK is also undertaking paddy quality seed production of promising varities, production of quality planting material, vermicompost, micronutrient mixture to meet out the demand of the farming community in the district along with establishment of soil and water testing laboratory. Along with these activities Assessment and demonstration of new technologies according to problem identified in the district. In 2015-16 the programme was initiated by the KVK by identifying the different cropping pattern of the Koppal district.

Materials and Methods

The major enterprises related to agriculture and allied sectors in 4.33 lakh ha area are field crops, horticulture crops, Animal husbandry, fisheries, and processing and value addition. Through participatory rural appraisal the problem were identified in each above mention sectors and suitable technologies/interventions to address these problems were finalized. In 2015-16 there are total of 111 farmers has been selected out of 200 surveyed who are in close association with KVK and the group discussion were carried out to prioritized the suitable technological intervention for each of the selected farmers according to the resources available with them. The emphasis on technology adoption was based on their present income status as on that current year i.e. 2015-16. KVK has collected the improvement data of family income after 4 years of technology adoption by the farmers from 2016-17 to 2020-21.

Results and Discussion

In a survey among 111 farmers, based on the intervention adaptation 34 different categories were observed with in small, marginal and big farmers (Table 1). Out of 111 farmers under study 64 farmers changed their farming adoption in 5 different categories with the bunches of 10,11,14 and 15 farmers each category by growing different field crops, high valued horticulture crops, adopting integrated pest, disease and nutrient management and through Animal husbandry. The are of adoption with a greater number of farmers in five different category was 519.31 acre. Next 30 farmers were paced the 12 different categories with change in farming situation by growing different field crops, high valued horticulture crops, Sheep, Goat, Poultry, Honey bee rearing. The area od adoption by 30 farmers was 274.17 acre. Remaining 34 farmers income increased with suitable technological adoption. Remaining 13 farmers were found with 13 different categories of change in farming adoption. Overall horticulture crops and animal components helped majorly in increasing the farmers income followed by ICM, IPM, IDM and INM and value addition.

Table 1: Change in the farming system, adaptation and percent increase

SL. No.	Present farming	Change In Farming	Adoption Number	Area (Acre)
1	Field crops	Field crop + Horticulture	11	108.45
2	Field crops	Field crops + INM, IPM, IDM	15	61.86
3	Field crops	Field crops + INM, IPM, IDM + AH	14	109.5
4	Filed crops + AH	Field crops + INM, IPM, IDM + AH	14	135.5
5	Field crops + Horticulture crops	Field crops + Horticulture crops + INM, IPM, IDM	10	104
6	Field crop + AH	Field crop + Horticulture+ AH	4	18.14
7	Field crops	Field crop + Horticulture + AH	3	19.5
8	Field crops	Field Crops + Value addition	3	10
9	Field crops	Horticulture crops	3	9.5
10	Field crops + Horticulture crops	Field crops + Horticulture crops + Flower crop	3	72.8
11	Horticulture crops + Field crops	Horticulture crops + Field crops + AH	2	24
12	Field crops	Field crops + HB	2	20
13	Field crops + AH	Field crops + AH + Sheep and Goat	2	15.5
14	Field crops	Field crops + sheep + AH+ Poultry	2	11
15	Field crops + AH	Field Crops + AH + VC	2	24
16	Field crops + Horticulture crops +AH	Field crops + Horticulture crops +AH	2	44.35
17	Field crops	Field crop + Horticulture crop + AH + Sheep	2	5.38
18	Field crops + Millers + AH	Millets and Value addition + AH	1	9.29
19	Field crops	Field crops+ AH + VC + Mushroom	1	3
20	Field crops	Field crops + AH	1	10
21	Field crops + Horticulture crops	Field crops + Horticulture crops + HB	1	10
22	Field crops	Field crops + Horticulture crops	1	4
23	Field crops + AH	Field Crops + AH + VC + Value addition	1	4
24	Millet	Millet + Processing machinery	1	4
25	Field crop	Field crop + Mushroom	1	2
26	Field crops	Field crops + Value addition	1	2
27	Horticulture crops + Bee	Horticulture crops + Bee	1	3
28	Field crops + VC	Field crops + VC	1	7.5
29	Horticulture	Horticulture IPDM	1	2
30	Field crop + Flower	Field crops + Vegetable	1	2
31	Sericulture	Horticulture	1	7
32	Field crops + AH + Sheep	Field crops + AH + Sheep	1	2.5
33	Field crops	Field crops + Horticulture + AH + Poultry	1	4
34	Field crops + Sheep	Field crops + Sheep	1	2

Sector-specific Interventions

The results of technological interventions adopted by the 111 farmers was categorised into field crops, horticulture crops, animal husbandry, fisheries, processing and value addition.

Field crops

- Promotion of improved of paddy varieties like GNV 10-89 for saline soils, RPBio-226 BPH Tolerance and high yielding GNV-1109, Tungabhadra sona, RNR-15048 in 25,000 ha of TBP area
- Promotion of direct seeding of rice (DSR), mechanical transplanting and integrated crop management (ICM) practices in paddy
- Increased returns by marketing of organically cultivated Rice
- Nipping technology practices in Redgram and Bengal gram and use of pulse magic and chick pea magic increased 15-20% yield
- Area spread of Millets with new high yielding varieties of Foxtail millet (SiA-2644, HN-46 DHFt-109-3), Little millet (DHLM 36-3), Barnyard millet (DHBM 93-3), Kodo Millet (RK-390-25) and Brown top millet (HBr-2).
- Introduction of new varieties of chickpea (BGD 103, JG-11), green gram (BGS 9), black gram (DBGV-5, DU-1) and sunflower (KBSH 53, RFSH 1887).
- Eco friendly pest management by using of pheronome traps and bio pesticides the reduces cost of cultivation in paddy and maize.
- Integrated pest management (IPM) of fall armyworm in maize and gall midge in paddy.

Horticultural crops

- Integrated nutrient management in important vegetable crops of the district *viz* Onion, Tomato chilli, Brinjal, Ridgegourd, Bittergourd, Okra, cabbage.
- Integrated nutrient management in important in Mango, Banana, Grape, Guava, Sapota, Pomegranate and acid Lime.
- Micronutrient management by Arka vegetable special in crops like Onion, Tomato, chilli, Ridgegourd, and cabbage.
- Micronutrient management in Mango and Banana for to reduce fruit dropping and fruit splitting
- IPDM in Mango, Banana, Guava, Grape, Tomato, chilli, Onion, Gourds, Brinjal and Okra.
- Crop diversification with Drumstick cultivation and cultivation of new plantation crop Cocoa.
- Cultivation of IIHR Tuberose variety Arka Prajwal and marigold variety Arka Bangara-2.
- Cultivation of high yielding Okra hybrids Arka Nikhita and variety Phule Vimukta.
- Area expansion of loose flowers like Rose, Jasmine, Kakada, Tuberose, Marigold.
- Area expansion of Guava, Mango, Grape and Pomegranate by 3%.
- Value addition with raisin making by grape growers.

Animal husbandry

- Adopted non-conventional feed ingredients like Azolla on wet basis (10% to 30% commercial feed replacement) both backyard and commercial poultry farming.
- Introduction progesterone coated nano particles for augmenting fertility in dairy Buffaloes and cows.
- Introduction of fodder block combination of grass, cereal and legume crop to provide the balanced feed ration (Hybrid/Super Napier, Multicut sorghum CoFs-29/31, Hedge lucerne, Sesbania) and also encourage to become entrepreneur in fodder seed production.
- Introduction of breeds of backyard poultry (Aseel, Kadaknath), low-cost incubation and hatchery unit and feed supplementation with azolla.
- Promotion of balanced nutrition, area-specific mineral mixture, species specific mineral mixture for small ruminants and clean milk production practices in dairy animals.
- Cost-efficient nutrition management with locally-prepared feed formulations.
- Semi-intensive and intensive sheep and goat farming, micronutrient supplementation and deworming practices
- Encourage to dairy start up with indigenous animals like Sahiwal, Gir due to high demand for A2 milk

Fisheries

Promotion of short duration, high value fish farming by introducing Tilapia, Pangasius and amur carp in farm ponds

Farm and non-farm enterprises (Processing and value addition)

- Millet processing, value addition and direct and digital marketing strategies.
- Oyster mushroom cultivation.
- Value addition to Flax seeds and ground nut (Laddu, chutney powder) and direct marketing strategies.
- Custom hiring of farm machinery and thresher.
- Promotion of nutrition garden.
- Value addition to lemon and tamarind (Pickles chutney and tamarind candy).
- Value addition to *sugandi* banana (Flour, Roti).
- Promotion of traditional paddy *toranas* as alternate income enterprises.
- Promotion of beekeeping and vermicomposting.

The average income of farm households, before and after the interventions, more than doubled (2.63 times) between 2016-17 and 2020-21 (Table 2). The share of enterprises in household income, although small, experienced 43.24 times increase during this period. Income from fisheries increased 100 % and from livestock 6.7 times. Livestock sector consolidated its share in the household income to 18.93 per cent in 2020-21 from 7.37 per cent in 2016-17. Horticulture component experienced 3.1 times increase in income over benchmark year. It proved to be the higher source of household income with contribution of 38.60 per cent to the additional income.

Impact on Household Income

Table 2: Level and change in household income

Crops and enterprises	Net income (Rs/household at current prices)		% Increase in income	% share in total income		% share in additional income
	2016-17	2020-21		2016-17	2020-21	
Field crops	109256	191782	75.53	62.56	41.76	28.99
Horticulture	52102	161991	210.91	29.84	35.27	38.60
Livestock	12865	86931	575.70	7.37	18.93	26.02
Fisheries	0	1081	100.00	0.00	0.24	0.38
Farm and non-farm enterprises	405	17515	4220.44	0.23	3.81	6.01
Total	174,628	459,300	163.02	100.00	100.00	100.00

Table 3: Income level and change in household income by land class

Land class	No of households	% share in Total household	Net income (Rs/household)		% change in household income
			2016-17	2020-21	
Landless	0	0	0	0	0
Marginal (<1.0 ha)	17	15.32	34012	127543	274.99
Small (1-2 ha)	35	31.53	91156	282033	209.39
Medium (2-4 ha)	35	31.53	124860	402396	222.28
Large (>4 ha)	24	21.62	468540	1035793	121.07
Total	111	100.00	174,628	459,300	163.02

Farmers from all land classes benefitted from the technical interventions (Table 3). However, the households at the bottom of land distribution benefitted relatively more. Marginal and small farm households were benefited by 3.7- and 3.1-times increased income, respectively. The medium and large farm households could realize 3.2 times increase in their household income.

Conclusion

Uplifting the farmers income in the present scenario with change in climatic condition is very challenging. Integrated approaches are the base for increased farmers income. Crop diversification integrated approaches in pest, disease and nutrient management, value addition played considerable role in increasing the farmers income. Ultimately field crops should be combined with horticulture crops, different animal components and value addition prioritized ones for increasing the farmers income.

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