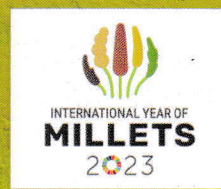




Technological Opportunities for Increasing Farmers Income in Karnataka



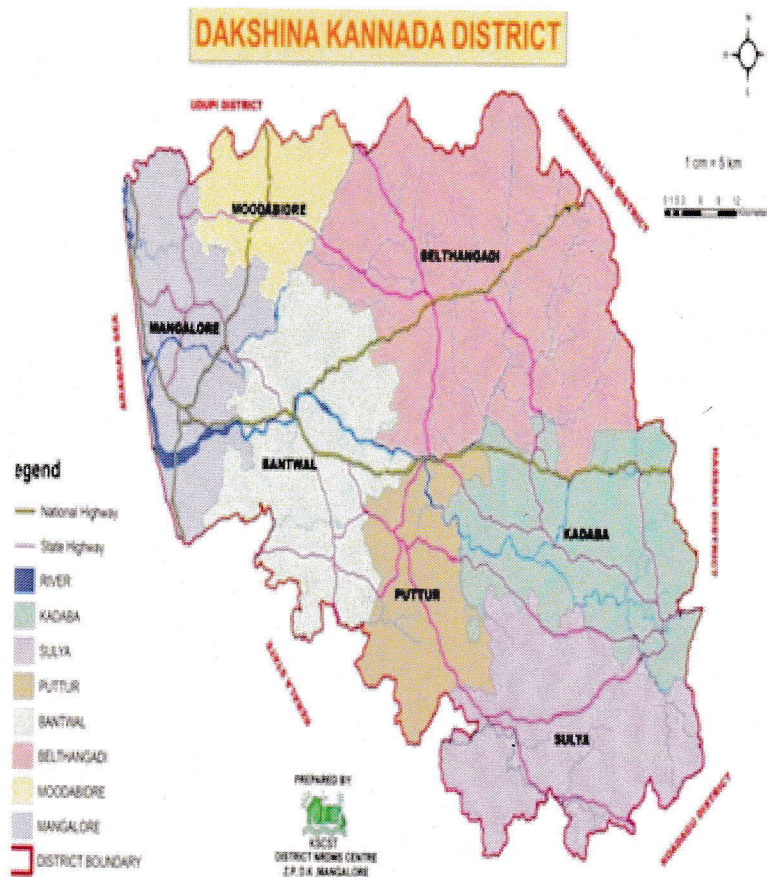
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DAKSHINA KANNADA

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ICAR-Krishi Vigyan Kendra, Dakshina Kannada



About the district

Dakshina Kannada district has a total of 4.03 lakh holdings with a gross cropped area of 1.57 lakh hectares. Out of 1.41 lakh hectare of net area sown, the net irrigated area is 1.17 lakh



ha (79.03%). Among cereals, paddy accounted for 8.99 per cent area. Dakshina Kannada is one of the leading districts for horticulture crops with an area of 1.25 lakhha under plantation, fruits and vegetable crops. Among them, plantation crops occupy majority of the area (87.4%). Dakshina Kannada has rich resources under livestock with 2.53 lakh cattle, 0.33 lakh goats, and 25.95 lakh poultry birds. The district produces 1,69,000tonnes of milk, 4,26,000 lakhs eggs, 5491 tonnes of meat and 143665 tonnes of fish catch annually.

About KVK Dakshina Kannada

Krishi Vigyan Kendra, Dakshina Kannada is established by the Indian Council of Agriculture Research (ICAR), New Delhi in the year 2004 at Agriculture Research Station, Kankanady, Mangalore, Karnataka State, under the then University of Agriculture Sciences, Bangalore and has become part of Karnataka Veterinary Animal and Fisheries Sciences University, Bidar since 01-09-2011. The operational area of this KVK comes under coastal Zone, comprising of seven talukas Mangalore, Puttur, Bantwal, Sullya, Belthangady, Kadaba and Moodabidri. Apart from the mandated activities like OFTs, FLDs and capacity development programmes, KVK is also involved in production of seeds and planting materials.

As part of the national agenda of doubling farmers income, the ICAR KVK Dakshina Kannada took up documentation of successful farmers who could enhance their income with the help and support of technological interventions by this KVK. A brief summary of interventions, the impact in terms of household income under different components and the change in income for different land-class categories is given below.

1. Sector specific interventions by KVK Dakshina Kannada

1.1 Field crops

- Introduction of flood resistant red rice variety Sahyadri Panoramukhi for lowlands of coastal Karnataka.
- Integrated crop management in paddy.

- Soil acidity management.
- Potassium management in coastal paddy.

1.2 Horticultural crops

- Integrated pest and disease management practices in arecanut.
- Integrated pest and disease management practices in coconut.
- Nutrient management in arecanut to reduce nut dropping.
- Nutrient management in coconut to reduce nut dropping.
- Horticulture based integrated farming system.
- Integrated pest and disease management in black pepper.

1.3 Animal husbandry

- Promotion of fodder varieties Co-3 and 4 to tackle green fodder shortage during summer.
- Goat farming.
- Integrated farming system.
- Backyard poultry.

1.4 Fisheries

- Composite fish culture.

1.5 Farm and non- farm enterprises

- Seed production of paddy, okra and fodder crops.
- Vermicomposting.
- Value addition in cashew and pineapple
- Beekeeping.

2. Impact on household income

The average income of farm households after the interventions has more than doubled (2.47 times) between 2016-17 and 2020-21 (Table 63). The share of enterprises in household income, although small, experienced 4.3 times increase during this

period. Income from fisheries increased four-fold and from livestock 3.1 times. Livestock sector consolidated its share in the household income to 11.26 per cent in 2020-21 from 8.98 per cent in 2016-17. Horticulture component experienced 2.5 times increase in income over benchmark year.

Horticulture is the dominant source of household income with contribution of 58.06 per cent to the additional income. It is also the major sector in terms of total household income with a share of 57.28 per cent.

Table 63: 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	78925	153727	94.78	30.65	24.17	19.76
Horticulture	144549	364361	152.07	56.13	57.28	58.06
Livestock	23133	71654	209.75	8.98	11.26	12.82
Fisheries	1921	7687	300.16	0.75	1.21	1.52
Farm and non-farm enterprises	8985	38670	330.38	3.49	6.08	7.84
Overall	257513	636099	147.02	100.00	100.00	100.00

Farmers from all land classes were benefitted from the technical interventions (Table 64). However, the households at the bottom of land distribution were benefitted relatively more. The income of the landless families increased 3.5 times (251.2%). Marginal and small farm households were benefitted by 2.6 and 2.5 times increased income, respectively. The medium and large farm households could realize 2.4 times increase in their household income.

Table 64: Income level and change in household income by land class

Land class	Households (No.)	Share in total household (%)	Net income (Rs/household)		Change in household income (%)
			2016-17	2020-21	
Landless	20	0.55	78702	276401	251.20
Marginal (<1.0 ha)	790	21.66	109268	286108	161.84
Small (1-2 ha)	1479	40.54	175155	441184	151.88
Medium (2-4 ha)	865	23.71	296934	721890	143.11
Large (>4 ha)	494	13.54	679367	1643701	141.95
Total	3648	100.00	257513	636099	147.02



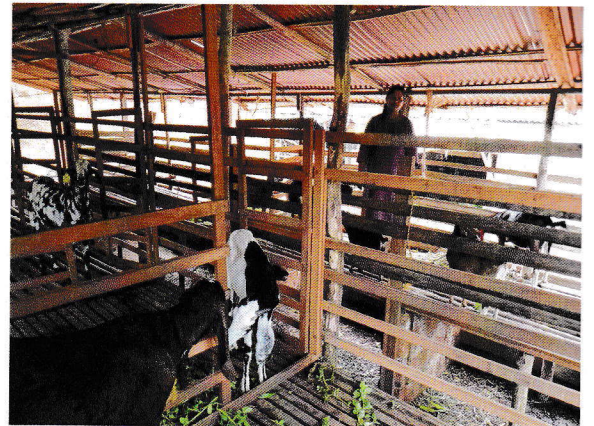
Water quality management and scientific feeding in fish culture



Managing flood prone paddy field



Flood tolerant red rice variety



Goatery in IFS farmer Smt. Anitha Naik, Bettampady village, Puttur taluk

UDUPI

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ICAR-Krishi Vigyan Kendra, Udupi

ತಾಲ್ಲೂಕುಗಳ ನಕ್ಷೆ - ಉಡುಪಿ ಜಿಲ್ಲೆ

Taluk maps - Udupi District



About district

Udupi district, situated in the coastal region of Karnataka, is characterized by high rainfall (with normal rainfall of 3850 mm and with 80 per cent of the rainfall received during June to September months). The three major agro-ecological situations viz., coastal plain, rolling mid land and Western Ghats are the distinctive



characters of the district. Out of total geographical area of 3.56 lakh ha, an extent of 1.00 lakh ha (28.1%) comes under cultivated area. Net irrigated area at present is 0.29 lakh ha and the main source of irrigation is through open wells and tube wells. Paddy is the main crop of the district which is occupying an area of 37,725 ha (2021-22), 37.92 per cent of the gross cropped area followed by plantation crops such as cashew (19,411 ha) coconut (17,299), arecanut (6,881 ha) and rubber (2,225 ha). The cultivation of vegetable crops is limited to paddy fallow land during *rabi* and summer seasons. The major vegetable crops of the district are okra, ridgegourd, snakegourd, bottlegourd, bittergourd and brinjal (variety Mattugulla a GI crop of the district).

The Udupi jasmine popularly known as Udupi mallige (another GI crop of the district) cultivated in an area of 313 ha is the major revenue earning crop of marginal and small farmers. The interior talukas of Udupi district comprising of Hebri and Karkala tq is dominated by arecanut as the major commercial crop. Black pepper (282 ha), cocoa (110 ha), nutmeg are the important intercrops grown in arecanut gardens. Cashewnut which is cultivated in marginal and poor soils has low productivity of 2051 kg/hectare due to lack of poor nutrition and poor management of tea mosquito bug and stem borer.

About KVK Udupi

ICAR-Krishi Vigyan Kendra for Udupi district was started during 2002, which comes under zone-X (Coastal zone) of agro climatic zones of Karnataka. KVK has different demonstration units like poultry farming, vermicompost unit, polyhouse, shade net house, bush pepper, udupi jasmine and okra seed production. High density planting of different varieties of cashew have been taken up in seven acres of land. In three acres of paddy plot new variety Madhura Mangala, arecanut demonstration plot have been established. In three polyhouse and shadenet houses, number of nursery activities like raising of arecanut nursery plants, gumless jack, udupi jasmine, six varieties of pepper cuttings in serpentine method of propagation, papaya, bush pepper, kokum grafts is being carried out. To meet

out the high demand for the vegetable seeds, KVK has played a major role in production of okra seeds every year.

As part of national agenda of doubling farmers, income, the ICAR-KVK, Udupi took up documentation of successful farmers who were able to enhance their income with the help of technological interventions by the KVKs. A brief summary of interventions, the impact in terms of household income under different components and the change in income for different land class categories is given below.

1. Sector specific intervention by KVK Udupi

1.1 Field crops

- Introduction of improved varieties of paddy viz., Sahyadri Panchamukhi (lowland situation and flood tolerant) for *kharif* season. MO-21(Pratyasa) for *rabi* season.
- Introduction of paddy mechanization technologies viz., machine transplanting (four rows) power operated conoweeder, combined harvester and tray method of nursery raising.
- Introduction of new varieties in blackgram viz., LBG-625 (Rashmi), DU-1, LBG-751 and cowpea (Sahyadri Yukthi) and fieldbean(HA3 and HA4).
- Introduction of new groundnut varieties viz., ICGV-91114, KCG-2, G-2-52, GPBD-4 and Dh-256 in rice fallows.
- Promotion of IWM, INM and IPM in field crops.
- Promotion of seed treatment in cereals with *Azospirillum* and *Azotobacter*, pulses and oilseeds with *Rhizobium* and PSB.
- Integrated management of sucking pests and diseases in paddy.
- Management of pest and diseases in groundnut.
- Reclamation of acid soils in paddy and groundnut.
- STCR approach and INM practices in paddy and groundnut and to alleviate secondary



and micro-nutrient deficiency and to boost crop productivity.

1.2 Horticultural crops

- Promotion of grafted black pepper with foot rot resistant root stocks.
- Enhancing off season flowering in udupi jasmine by practicing pruning and nutrient management.
- Introduction of high yielding papaya variety Arka Prabhath.
- Intercropping frenchbean variety (Arka Arjun and Arka Sharath) in arecanut garden.
- Promotion of new varieties of ridgegourd (Arka Prasan), spine gourd (Arka Bharath) and yard long bean (Arka Mangala).
- Arecanut root grub management through integrated pest management practices.
- Bio-intensive management of quick wilt in black pepper.
- Management of sucking pests and bud necrosis disease in watermelon.
- Bio-intensive management of fruit and shoot borer in brinjal.
- Management of *rhinoceros beetle*, red palm weevil and rugose spiraling whitefly in coconut.
- Management of wilt disease in udupi jasmine.
- Integrated plant nutrient management practices in arecanut, coconut, cashew and pepper.

1.3 Fisheries

- Promotion of growth performance of all male tilapia in coastal farm ponds, mixed carp seed rearing in pens, encouraging rearing of grass carp stunted fingerlings in farm ponds, culture of amur common carp in polyculture system.
- Assessment of growth performance of murels in trash fish infested coastal farm ponds.

- Feed based culture of carps in farm ponds.
- Management of water quality in carp culture pond.
- Aquatic insects control and nutritional balancing by carp nursery feed developed by ICAR CIFA, Bhubaneswar.
- Value addition of low value fish and shellfish product preparation and marketing.

1.4 Farm and non-farm enterprises

- Tray method of nursery raising in paddy, mechanized planting through custom hiring services, seed production in paddy, groundnut and blackgram.
- Raising of horticultural crop nursery viz., coconut, arecanut, black pepper, papaya, mango, jasmine, mattugulla and betelvine.
- Value addition of locally available fruits and vegetables such as jack, cashew, coconut, mango, pineapple, banana, sweet potato and minor fruits.
- Bee keeping for honey production and value addition.
- Oyster Mushroom cultivation, its value addition and marketing.
- Friends of coconut tree (FOCT) and coconut climbing skill training to rural youth using palm climbing device.

2. Impact on household income

The change in average income of farm households was more than double (2.08 times) when compared to before and after the interventions of the technologies between 2016-17 and 2020-21 (Table 65). The share of fishery income experienced 2.50 times increase, income from horticulture crops increased 2.40 times, livestock 2.03 times and field crops component experienced 1.86 times increase. Whereas, farm and nonfarm enterprises recorded 1.6 times increase in income over benchmark year. Fishery component proved to be dominant source of household income with contribution of 39.54 per cent to the additional income of the farmers

followed by horticulture component (29.21%) and farm and nonfarm enterprises (22.51%).

Table 65: 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	25607	47703	86.28	2.22	1.98	1.76
Horticulture	260690	626318	140.25	22.59	26.04	29.21
Livestock	84323	171543	103.43	7.31	7.13	6.96
Fishery	330740	825675	149.64	28.67	34.33	39.54
Farm and non-farm Enterprises	452450	734200	62.27	39.21	30.52	22.51
Overall	1153811	2405440	108.47	100.00	100.00	100.00

Farmers from all land classes were benefited from the technical interventions (Table 66). The income of the marginal (<1.0 ha) farm households family increased 2.56 times (156.51%). Medium (2-4 ha) and small (1-2 ha) farm households achieved 2.4 times (138.75%) and 2.33 times (133.82%) increased income, respectively. The large farm households (>4 ha) could experience 2.16 times (115.92%) increase in their household income.

Table 66: Income level and change in household income by land class

Land class	Households (No.)	Share in total household (%)	Net income (Rs/household)		Change in household income (%)
			2016-17	2020-21	
Marginal (<1.0 ha)	27	24.32	250962.04	643737.00	156.51
Small (1-2 ha)	52	46.85	244504.71	571706.73	133.82
Medium (2-4 ha)	25	22.52	527174.44	1258652.96	138.75
Large (>4 ha)	7	6.31	1026785.71	2216997.14	115.92
Total	111	100	2049426.90	4691093.83	109.00



University officials and farmers visiting paddy demonstration field



Demonstration on management of arcanut root grub through integrated management strategies.