PROMOTION OF ORGANIC INPUTS AS RESOURCE CONSERVATION TECHNOLOGY FOR SUSTAINABLE PRODUCTIVITY

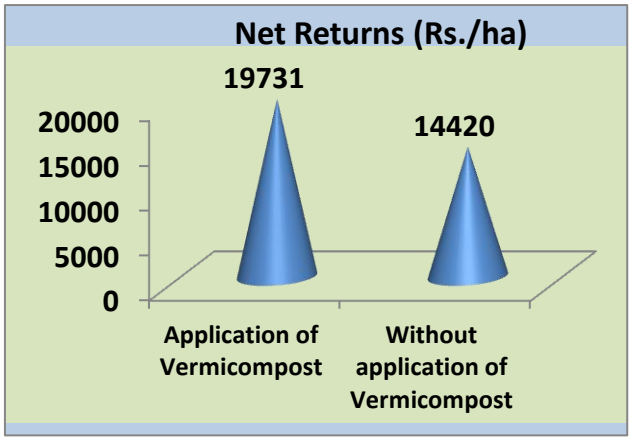
Input : KVK introduced organic inputs viz., Vermicompost, Beejamruta and Jeevamurta as resource conservation technology through Front Line Demonstrations, awareness programmes, capacity building and extension programmes. 189 awareness programmes, 58 training programmes and 31 Front Line Demonstrations were organised and KVK supplied 1450 Kgs of Earthworms to farmers

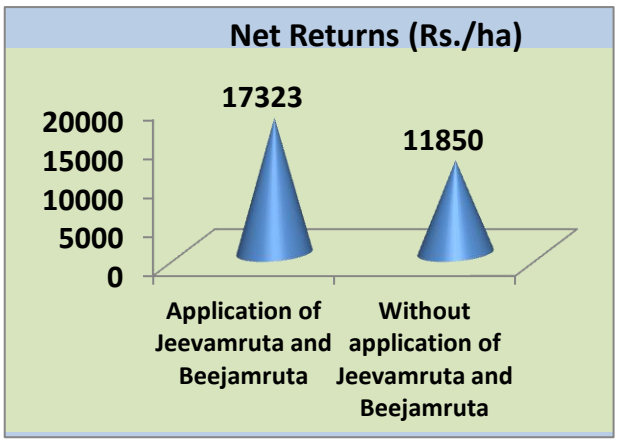
Output :

Technology	Area under FLD (Ha.)	No. of farmers	Crop	Yield (Qtls./ha.)		Increase in yield (%)	Net Returns (Rs./ha.)	
				Demo	Local		Demo	Local
FLD on Vermicompost application on crop productivity **(Dry land condition)**	17	17	Rabi Sorghum	12.80	10.80	26.83	19731	14420
FLD on Jeevamurta & Beejamruta application on crop productivity **(Dry land condition)**	14	14	Rabi Sorghum	7.65	8.42	14.61	17323	11850

DEMONSTRATION ON PREPARATION OF JEEVAMURTA

Application of Vermicompost and Jeevamruta has yielded 12.8 qtls./ha and 7.65 qtls./ha. in Rabi Sorghum respectively as against 10.80 qtls./ha. and 8.42 qtls./ha. Net returns of Rs.19,731/- and Rs.17,323/- are realised in both the technologies respectively.





Outcome & Impact :

There is additional net returns of Rs.5,311/- per hectare in Rabi Sorghum through application of Vermicompost. Area under Rabi Sorghum . using this technology is around 2000 ha. in the district Application of Beejamruta & Jeevamrutha has resulted in additional net returns of Rs.5,473/- per hectare. Farmers have been applying it in around 500 ha. in Rabi Sorghum crop in the district. Further, during last five years, 338 Vermicompost units have been established in the district with the annual production of 5500 tonns.

DETAILED IMPACT ANALYSIS OF VERMICOMPOST TECHNOLOGY

INTRODUCTION:

Increasing frequency of agricultural droughts coupled with high cost of chemical fertilizers has really created distress situation for the farming community of Gadag district. Unsustainable productivity of crops and income insecurity from agricultural profession has been the great concern. Looking in to this grave situation, KVK has made production and promotion of organic inputs especially vermicompost as one of the thrust areas for addressing issues concerning the farming community. KVK has been playing a significant role in promotion of vermicompost technology through sensitization programme, Front Line Demonstrations, training programmes, extension activities, production and sale of earthworms. KVK has been motivating farmers to adopt vermicompost technology as it not only conserves the soil moisture but reduces the cost of cultivation i.e cost incurred on purchase of chemical fertilizers. Keeping in mind the significance of the technology and its impact, a study has been conducted by KVK to know the impact of technology.

INTERVENTIONS OF KVK:

Decreasing productivity of crops due to moisture stress during critical stages of crop growth coupled with high cost of chemical fertilizers were the major issues. In this context KVK made thorough analysis of the situation and decided to promote vermicompost technology for sustainable crop production. The following interventions were made by KVK.

i) Sensitization programmes:

KVK organised sensitization camps in the villages to apprise the farmers about importance of vermicompost technology and its application for sustainable agricultural productivity. Farmers were sensitised through video shows, success stories and supply of extension literatures on vermicompost production technology. During the period from 2005-06 to 2014-15, KVK organised 232 sensitization camps in the villages.

ii) Capacity building training programmes:

The awareness programmes organised in the villages have created lot of impact among the farming community on production and application of vermicompost. Taking farmers interest in to consideration, KVK organised capacity building training programmes both on and off campus on vermicompost production technology. Farmers were exposed to various skills involved in the production of vermicompost. KVK collaborated with State Department of Agriculture and Khadi Village Industries Board for organising the training programme. Exposure visit to vermicompost production units of farmers were organised and experience sharing was facilitated. During the period from 2005-06 to 2014-15, KVK organised 109 skill trainings and 3221 farmers and farm women participated. The details of training programmes organised is presented in Table-1.

Table-1: Yearwise trainings organised

Year	No. of training courses	Number of farmers
2005-06	8	248
2006-07	14	402
2007-08	12	337
2008-09	14	378
2009-10	10	282
2010-11	12	348
2011-12	9	263
2012-13	6	182
2013-14	13	440
2014-15	11	341
Total	**109**	**3221**

Taluka wise details of farmers trained:

Taluka wise details of training programmes organised and the farmers participated is presented in Table-2.

Table-2: Taluka wise number of farmers trained

Name of taluka	Number of courses	Number of farmers
Gadag	29	973
Mundaragi	19	658
Shirahatti	22	610
Ron	25	620
Naragund	14	360
Total	**111**	**3221**

iii) Farm advisory services

After attending training programme at KVK, farmers started vermicompost production units. Post training advisory services were rendered to farmers who have started vermicompost units. There was continuous interaction between farmers and KVK experts during field visits and off campus progamme. KVK rendered 1011 advisory services to farmers during 2005-06 to 2014-15. During the same period, KVK prepared and supplied

158 project proposals on vermicompost technology to farmers. Further, facilitated farmers to get loan from Banks and support from various schemes of Government of Karnataka.

iv) Sale of earthworm by KVK:

Sale of earthworm is another major intervention of KVK to support the farmers for establishment of vermicompost units. This intervention has played a major role in promotion of vermicompost technology in Gadag district. During the 10 years period from 2005-06 to 2014-15, KVK sold 1852 Kg of earthworm to farmers. Besides this, there was also sale of earthworms from farmer to farmer. The details of sale of earthworm by KVK is presented in Table-3.

Table-3 : Yearwise sale of earthworms by KVK

Year	Total sale (Kgs)
2005-06	120
2006-07	94
2007-08	127
2008-09	250
2009-10	180
2010-11	220
2011-12	310
2012-13	177
2013-14	200
2014-15	174
Total	**1852**

IMPACT STUDY DETAILS:

It is evident from the KVK intervention that there has been wide spread adoption of vermicompost technology by the farmers. In order to assess the impact of the technology on farming community, a study was conducted by KVK with following objectives.

Objectives:

i) To know the quantum of production of vermicompost
ii) To know the profit of farmers involved in vermicompost production
iii) To know the spread of technology from farmer to farmer
iv) To ascertain the area covered under application of vermicompost technologies
v) To know the reduction in the cost incurred on chemical fertilisers
vi) To know sale of earthworm and vermicompost

Methodology of study:

Out of total farmers trained by KVK on vermicompost production technology, one hundred farmers who have been Frontline Farmers and are closely associated with KVK have been purposefully selected for the study. Simple structured schedule was developed and information was collected during ex-trainee meet, on and off campus trainings and extension activities of KVK.

RESULTS OF THE IMPACT STUDY:

(1) Age of Farmers: Out of one hundred farmers, 43 belonged to middle aged category followed by again 43 farmers under old age category (Table-1). Only 14 farmers were young.

Table-4: Classification of farmers based on age (N=100)

Particulars	Number
Young farmers (Less than 35 years)	14
Middle aged farmers (36-50 years)	43
Old aged farmers (More than 51 years)	43

(2) Type of Farmers: Majority of the farmers belonged to small farmer category (No.44) followed by 42 big farmers. There were 13 farmers belonging to marginal farming category. One farmer belonged to landless category.

Table-5: Categorisation based on type of farmers (N=100)

Particulars	Numbers
Marginal farmers	13
Small farmers	44
Big farmers	42
Landless	1

(3) Caste of Farmers:

Majority of farmers belonged to backward community (57 Nos) followed by 27 other communities. There were 11 Scheduled Tribe and 5 Scheduled Caste farmers.

Table-6: Categorisation based on Caste (N=100)

Particulars	Numbers
Scheduled caste	5
Scheduled tribe	11
Backward community	57
Others	27

(4) Production Capacity of Vermicompost Units :

The perusal of Table-7 reveals that 36 farmers have produced vermicompost in below 50 tons annual production category. This is followed by 27 farmers in the category of 50-100 tons. About 25 farmers produced vermicompost in 101-150 ton annual production category. As many as 12 farmers fall in the category of more than 151 tonns of vermicompost production per year.

Table-7: Category wise production of vermicompost during 2014-15

Particulars	Numbers			
	Less than 50 tonns	50-100 tonns	101-150 tonns	More than 151 tonns
Marginal farmers	6	6	1	0
Small farmers	12	9	14	7
Big farmers	17	12	10	5
Landless	1	0	0	0
Total	**36**	**27**	**25**	**12**

(5) Sale of Earthworm by Farmers:

During three years period from 2012-13 to 2014-15, farmers have sold 2088 Kgs of earthworms and earned an income of Rs.619800 (Table-8). Earthworms were sold to 761 farmers. There has been a increasing trend over the years with respect to sale of earthworms which can be implied that more number of farmers were inclined towards vermicompost production and application which has reduced dependency on chemical fertilisers.

Table-8: Yearwise sale of earthworm by farmers

Year	Quantity (Kgs)	Income earned (Rs.)	Sold to number of farmers
2012-13	383	113700	136
2013-14	745	222900	266
2014-15	960	283200	359
Total	**2088**	**619800**	**761**

(6) Sale of Vermicompost by Farmers:

It is revealed from the Table-9 that farmers have produced 2128 tons of vermicompost during 2012-13 to 2014-15. They have retained 1673 tons for their use and sold 455 tons of vermicompost to 673 farmers. From the sale of vermicompost, farmers have earned an income of Rs.17.99 lakhs. There has been an increasing trend over the years with respect to production and sale of vermicompost indicating increased interest in production and application of vermicompost for sustainable production and reduced dependency on chemical fertilisers.

Table-9 : Yearwise sale of vermicompost by farmers

Year	Total production (tons)	Quantity retained (tons)	Quantity sold (tons)	Income from sale (Lakhs)	Sold to number of farmers
2012-13	496	407.2	88.8	3.55	131
2013-14	678	511.8	166.2	6.44	253
2014-15	954	754.0	200.0	8.00	289
Total	2128	1673	455	17.99	673

(7) Quantity of Application of Vermicompost:

It is evident from the Table-10 that farmers have applied fair quantity of vermicompost to the crops cultivated by them. They have applied large quantities of vermicompost to commercial crops like Maize, Onion and Bt. Cotton. The table also reveals that 1991 hectare area was covered under vermicompost application in different crops during 2012-13 to 2014-15.

Table-10: Average quantity of application of vermicompost to different crops

Sl. No.	Crop	No. of farmers	Quantity applied (Qtl/ha)	Area applied (ha)
1	Bengalgram	11	8.72	338
2	Greengram	21	8.14	552
3	Chilli	3	10.66	25
4	Bt. Cotton	7	9.7	51
5	Groundnut	29	8.17	402
6	Maize	5	11.00	35
7	Sunflower	8	7.50	171
8	Onion	7	11.57	42
9	Rabi sorghum	20	7.00	275
10	Wheat	10	8.50	100
			Total	**1991**

(8) Productivity, Net Returns and Reduced Cost of Cultivation:

Depending on the production capacity of vermicompost and the land holding farmers have applied vermicompost to various crops.

Table-11 depicts the productivity of crops, net returns gained and reduced cost through application of vermicompost by the farmers. The table reveals that there has been a good productivity of crops and net returns obtained even during drought years. This is the motivation factor for farmers to adopt vermicompost technology for sustainable productivity and income. Farmers here also saved considerable amount of money on cost of chemical fertilisers (Rs.65.76 lakhs). It clearly indicates that farmers have been largely benefited by the adoption of vermicompost technology.

Table- 11 : Details of productivity, net returns and reduced cost

Sl. No.	Crop	No. of farmers	Average yield (Qtl/ha)	Average net returns (Rs./ha)	Average reduced cost (Rs./ha)	Total reduced cost (Rs. In lakhs)
1	Bengalgram	11	11.58	15750	3175	10.73
2	Greengram	21	8.04	18511	3363	18.56
3	Bt. Cotton	7	12.78	23437	3606	1.83
4	Chilli	3	9.33	37500	4708	1.17
5	Groundnut	29	11.15	15062	3450	13.86
6	Sunflower	8	10.78	11665	3200	5.47
7	Maize	5	35.00	19168	3950	1.38
8	Onion	7	67.23	58076	4384	1.84
9	Rabi Sorghum	20	14.80	17050	3000	8.25
10	Wheat	10	08.30	11910	2670	2.67
					Total	**65.76**

CONCLUSION:

The study conducted to know the impact of vermicompost technology revealed that there has been significant impact related to production of vermicompost and its application. The study reveals that the respondent farmers have sold earthworm worth of Rs.61 lakhs to 761 farmers. This has not only spread the technology but also provided income to farmers. The respondent farmers have also earned Rs.17 lakhs from the sale of vermicompost to other farmers. The impact study has clearly broughout the fact that there has been reduced average cost of cultivation to the tune of Rs.65.76 lakhs due to use of vermicompost technology in different crops. Further there has been production of sustainable yield in all crops and the farmers got good net returns even during agricultural drought years.