SUCCESS DOCUMENTATION OF BHOOCHETANA PROGRAMME 2014

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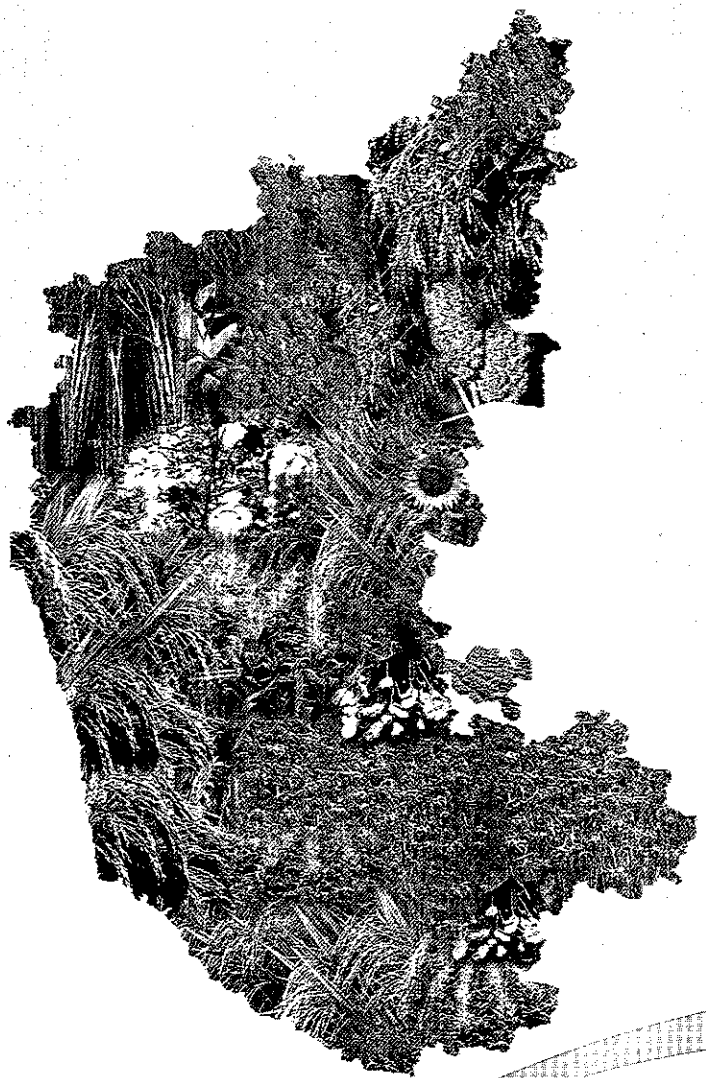

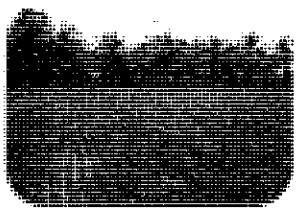

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Contents

1 Background

Government of Karnataka (GoK) had initiated a novel mission mode project called "Bhoochetana" i.e. "Reviving Soils", which was formally launched by the then Hon'ble Chief Minister of Karnataka in Haveri district on 23 May 2009. The project was implemented in phases by the Dept. of Agriculture along with other consortium partners viz. ICRISAT, SAUs and Watershed Development Dept., covering all the 30 districts of the State over a period of 4 years from 2009-10 to 2012-13and later continuedfor second phase from 2013-14 to 2017-18.

The main objective of the programme was to increase the crop productivity in dry land/rain fed areas of 30 districts of the State, by adopting improved technology, conduct soil tests, prepare soil test maps based on GIS in all districts, capacity building through the involvement of ICRISAT and KVK/SAU. The project was implemented with technical support/assistance from ICRISAT, Hyderabad.

2 Field Level Position BeforeBhoochetana Programme

ICRISAT study had revealed that large gaps exist between current farmers' crop yields, which are two to five times less than the achievable yields. The good news is that there is huge scope for improving rainwater use efficiency by employing balanced nutrition, improved cultivars using high yielding varieties/hybrids of crops and crop management practices.

The whole pre project scenario can be briefly summarized as under:

i) Lack of knowledge about micronutrients by large number of farmers specially the small and marginal and their reluctance to use micronutrients with the fear of adverse effect on soils and crops.

ii) The farmers, especially small and marginal, could not afford high cost inputs due to poor income levels from agricultural operation.

iii) Micronutrients which are being used today were not easily accessible to the farmers.

iv) There was lack of convergence of schemes in popularizing the use of micronutrients.

v) Farmers were not convinced and were not prepared to experiment the latest technologies.

vi) Lack of staff at grass root level to take up the technology to the door steps of farmers.

vii) Lack of Knowledge on the method, dosage and time of application of micronutrients.

The Bhoochetana first phase programme has been implemented for the last four years, viz. from 2009-10 to 2012-13. The Department of Agriculture,Government of Karnataka had therefore decided to conduct evaluation of the programme and document the success stories in various agro climatic zones of Karnataka by a third party. Accordingly, NABCONS has been awarded the contract vide work order of Dept. Of Agriculture No FCS/B.C/Documentation/ 2013-14 Dated 21 February 2013 for documenting the success stories through bidding process,. The terms of reference for the study, inter alia, are as under:

1. Data Collection

2. Survey

3. Preparation of document

4. Documentation of best practice should have broadly following elements.

i. Situation before the practice

ii. Encounters and challenges faced by the innovators

iii. Strategy adopted

iv. Results achieved /anticipated

v. Sustainability

vi. Lessons learnt

vii. Replicability

3 Challenges Encountered in implementation

Rainfed areas in Karnataka cover 60% of agriculture, provide 44% of the food production of the state and include 87% of coarse cereals and pulses, 75% of oil seeds and 65% of cotton. The prominent components of Indian foodstuff contributed by these areas are75% of pulses and more than 90% of sorghum, millet, and groundnut. These areas are the hot spots of poverty, water scarcity and droughts; land

degradation and low rainwater use efficiency and support 40% of the rural population mostly belonging to the poorer section of the society.Rainfed agricultural productivity is even crucial for food security and the economy of Karnataka as it has large rain fed area.

Department of Agriculture, GoK has been motivating the farmers through different initiatives like demonstrations, training and other subsidy oriented incentive programmes prior to Bhoochetana programme. But there was lack of concerted efforts to popularize the use of micronutrients by large number of farmers. The farmers also were not aware of the role of micronutrients in crop production. Only a few affordable farmers had some knowledge regarding use of Gypsum for Groundnut crop. Farmers even had not seen these packages of Zinc, Gypsum and Boron as they are seen in the RSK today. Moreover these inputs were not available in free market. The facility like technology transfer, support for micronutrients, seeds, and PP chemicals was not available at RSK's which is situated at hoblihead quarters.

3.1 Soil Fertility and diagnosis

Diagnostic soil sampling of over 96,000 farmers' fields in 30 districts of Karnataka had revealed that these soils were not only thirsty but also hungry for important scarce micro nutrients such as Zinc and Boron. In the Sujala project of 2008, Improved agricultural management practices increased yields of various crops by 33-58% in spite of the poor rains of 2008. Government of Karnataka has been pioneer in initiatingparticipatory watershed development programmes by constituting 4 Dry Land Development Boards (DLDBs) during 1984 to provide undivided attention to the much neglected dry land areas of the State. Theseefforts yielded models to be replicated elsewhere in the country in respective agro-ecological regions. In the succeeding efforts, successes and lessons learnt from theSujala-ICRISAT initiative, the Government of Karnataka (GoK), embarked on the path-breaking Bhoochetana programme as a holistic approach for the benefit offarmers who take up agricultural operations under rainfed conditions.

3.2 Agronomic Practices

To ensure better agronomic practices, it is necessary to introduce and practice balanced use of plant nutrients for correcting nutrient deficiency, restoring soil fertility of degraded lands due to over exploitation. The improved levels of soil nutrient increases water use efficiency, enhances crop yields, betters crop

productivity, environmental quality and ultimately farmers' income. Hence soil analysis were carried out and based on seasonal rainfall analysis and fertilizer doses were determined/recommended for adoption by farmers. Availability of organic manures, crop residues, bio-fertilizers, was also considered to provide taluk-wise recommendations for different crops in all districts.

4 Strategy adopted for implementation of the programme

The feedback from farmers indicated that a large number of farmers had medium or very low scientific orientation for agronomic practices. This could be due to their level of education, extension participation, extension contacts and nonuse of mass-media to educate themselves on new and emerging technologies. Besides,theireconomic condition might have also indirectly restricted them, to have orientation to try new scientific technologies.

Mass publicity was undertaken by the DoA through wall paintings, printing pamphlets, distribution of required inputs under subsidy on the various initiatives taken by the Govt. for improving production and productivity of the crops under rainfed areas. The farmers were also sensitized on various scientific approaches/techniques and improved farm practices through series of training programmes, exposure visits and study tours. These training programmeswere conducted by farmer facilitators, farmer field school in association with ICRISAT, KVK, SAUsand various line departments of the state to improve the knowledge and skills of the farmers. Usefulness of trainings might have changed the attitude of the farmers for taking up innovative and progressive farming systems.

In addition to the above, the DoA formulated several strategies through which the Bhoochetana scheme has been popularized. The main strategies are as under:

i) Awareness of the scheme through wall writings was an initial step to attract the farmers and enable them to know about the importance of soil fertility and its management through application of micronutrients. Awareness by way of publications and trainings was the other component.

ii) Converting the Raith Sampark Kendra as a single window system for supply of inputs in convenient packages along with the task of technology transfer.

iii) Providing 50% subsidy on micronutrients, seeds and making it mandatory to purchase seed treatments material like Rhizobium, Trichoderma

along with seed for seed treatment. This strategy has really worked in the field as farmers are today accustomed to the use of these materials.

iv) Fielding the farm facilitators (KrishiAnugar) for every 500 ha in Kharif and 1000 ha in Rabi seasons is another strategy which has been successful. The Farmer Facilitators provided the day to day farm tips and latest technology in Agriculture to farmers at their door steps. Farmers say, this is really a farmer friendly initiative and describes how Farmer Facilitators are the backbone of Bhoochetana programme for the revival of agriculture in rainfed areas.

v) Capacity building of farm facilitators (The KrishiAnugars) through imparting training regularly by the scientist of KrishiVignan Kendra / Research Stations of University of Agriculture Sciences, at Bangalore, Dharwad and Raichur.

vi) Creating opportunity for active learning through demonstrations andfarmers' field schools.

vii) Convergence of other schemes and departmental programmes.

4.1 Extension services to farmers

Farmers had regular contacts with extension/technical personnel at taluk and RSK level through farmer facilitators during cropping season. Easy accessibility to RSK locatedathobli/panchayatlevel was a distinct advantage under the programme.

4.2 Coordination and involvement of stakeholders

The project envisages clear role and responsibilities to the partners/stakeholders for the successful implementation of the Bhoochetanaprogramme for ensuring improved levels of production and productivity of the crops grown under rainfed/dry land agriculture taken up by farmers in all the districts of Karnataka State. The main partners identified for implementation of the project are Department of Agriculture,WatershedDevelopment,University of Agricultural Sciences, Bengaluru, Dharwad and Raichur and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Hyderabad, AP., India.

5 Anticipated results and actual achievements

The goal of Bhoochetana is to make a difference in the lives of farmers in all the

districts of Karnataka, increasing average crop productivity by 20% in four years. Themain objective was to identify and scale-up best bet options (soil, crop and water management), including: improved cultivars; training Department of Agriculture staff to perform stratified soil sampling, analyze micronutrientsand prepare GIS-based soil maps; improving skills of farmers and consortium partners in sustainable use of natural resources for enhancing crop productivity.

The micronutrients along with chemicals for seed treatment materials were directly supplied by RSKs to the farmers. The use of these two vital inputs has gradually increased and has reached to large number of farmers. It was learnt from few farmers that in future even if the RSK does not supply these inputs, they will manage to purchase them from outside and apply to their fields. By and large, farmers are happy about getting the seeds of their choice at a subsidised rate in RSK without any difficulty. The availability of inputs in time and in the required quantity has helped the farmers in a big way. Following are the main results achieved under the programme:

i) Increase in the yield of all the field crops to the extents of 25 to 30 % in the technology adopted areas. The increase in the yield is mainly attributed to seed replacement (Specially Tur-TS3R, groundnut GPBD-4 and a large number of maize varieties) and application of micronutrients and adoption of seed treatment with bio fertilizers and bio fungicide/pesticides. There are even instances of 50% yield increase as could be seen in the success stories enclosed to this report. Further, the importance of introduction of high yielding varieties in other major crops likeragi, paddy, maize, sorghum, etc., cannot be undermined in this rapid transformation of agriculture under Bhoochetana Programme.

ii) Acceptance of technology by large farmers.

iii) Quality of produce and byproducts has improved and the quality of grains, fruits and legumes was alsoenhanced considerably.

iv) Profitability has increased by way of low cost as well as increase in crop yield.

v) Introduction of new verities of crops also added to the increased yield and enhancement of farm income.

vi) Promotion of organic farming through large scale introduction of bio Agri gold and city compost.

5.1 Results anticipated

The anticipated results under the programme were as under:

i) Achieving 100 % adoption of micronutrients by continuing the present efforts.

ii) Popularisingthe use of vermicompostwithin farming community to the largest extent possible.

iii) Creation of seed and grain bank in every village through formation of seed village/seed bank groups.

iv) Conducting soil testing of all farmers field and getting them the soil health cards on time.

5.2 Results achieved on implementation

Established farmers' participatory research and development (PR&D) approach to evaluateproductivity enhancement technologies. Spatial distribution of nutrientsassessed using Geographic Information System (GIS)techniques. Production of soil nutrient status maps for thebenefit of policymakers as well as farmers resulting in them becoming eager partners in this mammoth project.Inputs consumption trends during four years weregradual and steady. There has been perceptible increase in consumption of recommended micronutrients viz., borax, ZnSO4 and gypsum in the state for rainfed crops. Howeverslightly low consumption of micronutrients was observed during 2009-10 and this was due to scanty rainfall situation that affected sowing operations in many districts. The data in Table 1 shows that large scope exists to enhance balanced nutrient consumption for achieving sustainable crop yields.

TABLE I

Distribution of Micronutrients to farmers in Bhoochetana programme during 2009-10 to 2012-13

Year/ Crop Season	Area (m.ha)	Quantity Consumed (tons)		
		ZnSO4	Gypsum	Borax
2009 Kharif	0.23	372	4309	53
2009-10 Rabi	0.06	-	-	-
2010 Kharif	1.27	2723	35376	389
2010-11 Rabi	0.37	362	5595	113
2011 Kharif	2.84	8775	96234	2781
2011-12 Rabi	0,66	1678	12475	432
2012 Kharif	3.57	6803	59935	3104
2012-13 Rabi	2.75	5109	36746	1494

(Source- Annual Report 2012-13)

6 Sustainability of the programme

The soil fertility management through application of micronutrients has successfully demonstrated a steady increase in yield levels of crops. The farmers are convinced about the application of organic matters like bio Agri gold, vermicompostand city compost which are available at affordable cost. The method of technology transfer and service provided have facilitated in infiltration of technology among the farming community. There are opinions among the farmers that they will continue the initiatives even without the Government subsidy. The importance of seed replacement is well realized and thus the farmers would find measures to produce and preserve quality seeds either on individual or on group basis. The advantages of seed treatment with bio agents has been well recognized and with the advantage of easy availability of seed treatment materials. As a result of this, farmers will continue to follow the practice of seed treatment.

During the last four years of implementation i.e. 2009-10 to 2012-13, there has been substantial growth in production and productivity of crop grown with the support and extension work taken up by DoA under the programme. The crop wise assessment of crop productivity of different crops during the rainy season and post rainy season 2011-12 was assessed based on crop cutting experiments. The results indicated that the programme is sustainable and could be a highly viable economic programme for the benefit of farmers.

6.1 Post-rainy Season 2011-12 Farmer Participatory Research (Rabi) –Crop wise Impact Trials

During the end of the season, crop cutting experiments were conducted with all prominent crops like chickpea, sorghum, sunflower and safflower.

Chickpea (Bengal gram)

The benefits of improved management were evident in enhanced chickpea productivity in all the districts A benefit of 30 to 55% rise in productivity was observed under the improved management.

Sorghum (Jowar)

During the post-rainy 2011-12, the benefit of improved management was seen in productivity improvement by 23 to 51% over the farmers practice.

Sunflower

Crop cutting experiments with sunflower crop in Bagalkote and Haveri districts. Improved crop management has resulted in the increased yields by 21 to 41 % substantially.

Safflower

Safflower is an important crop in Bagalkote and Haveri districts yielding healthy edible oil. The improved crop management had resulted in substantial yields of safflower and also proved to be an effective strategy recording an increase of 26 to 33% over the farmers practice.

6.2 Rainy Season2012 Farmer Participatory Research (Kharif)- Impact Trials

Maize

Maize is an important rainy season crop in many districts in Karnataka. The acreage under the crop is increasing year after year. Participatory trials were therefore conducted with maize in 18 districts during the rainy season 2012.. Improved management can significantly increase from 23 to 47% in grain yields

Groundnut

Across 13 districts in Karnataka, the benefit of improved management was seen in increased yields from. 17 to 45% higher yields over the farmers practice.

Pearl millet (Bajra)

Data on participatory trials data in 6 districts (Bagalkote, Bellary, Bijapur, Gulbarga, Koppal, Yadgir) in Karnataka showed that yields can be improved by 34 to 45%

Pigeon pea (Red gram/Tur)

Farmer participatory trials were conducted with pigeonpea crop during rainy 2012 season in 9 districts of Karnataka. Results showed productivity 23 to 37% increase over the farmers' practice in different districts.

Finger millet (Ragi)

Finger millet is an important crop in 12 districts. Participatory trials in these districts showed yields increase 20 to 38% over the farmers' practice.

Green gram

Farmer participatory trials were conducted with green gram crop which is an important short duration rainy season crop in Bidar, Gulbarga and Yadgir districts. an increase of 29 to 36% over the farmers practice.

Lab-lab (Avare/field beans)

Lab-lab is a major crop in Davanagere, Ramanagara, Hassan and Chickballapur districts inKarnataka. The improved management as such increased grain yield over the farmers' practice by 19 to 36%.

Paddy

Like all other crops, paddy yields under farmers' practice are also on lower side. Data from participatory trials in 13 districts showed from 17 to 46% through adoption of improved management practices.

Soybean

Soybean is an important crop in Bidar, Dharwad and Haveri districts (heavy textured soils). Improved management can increase soybean grain yield by 26 to 35% as compared with the farmers practice

Cotton

The benefits of improved management were evident due to enhanced yields froman increase of about 26 to 34% over the farmers' practice.

Sugarcane

Sugarcane is an important crop in Davanagere and Mandya districts. Like other crops inKarnataka, current crop yield of this cash crop is also low in spite of higher input use by the farmers. Results of crop cutting experiments during 2012 rainy season showed that improved management is a strategy that can increase current yields by 11%.

Sorghum

Participatory trials were done with sorghum in Bidar and Davanagere districts.The cropcutting data showed yields showing an increase of 26 to 35% over the farmers practice

6.3 Post-rainy Season 2012-13 Farmer Participatory Research (Rabi) - Impact Trials

Chickpea

During post-rainy 2012-13 season, farmer participatory trials were conducted with chickpeacrop in 7 districts (vertisols) inKarnataka. Increased productivity from about 22 to 41% over the farmers' practice.

Safflower

Safflower is a prominent crop in the districts of Gadag, Dharwad, Haveri, Bidar and Koppal (Vertisols). Participatorytrials were therefore conducted during post-rainy 2012-13 season to evaluate the effects of farmers' practice and improved management on safflower yield. Results showed relatively lower yields in Koppaldistrict as compared to those in Bidar district. However, the benefit of

improved management was realized in both the districts by 29 to 35% over the farmers' practice.

Rabi- Sorghum

Participatory trials in 7 districts in Karnataka showed rabisorghum productivity increase of about 21 to 40% over the farmers' practice.

Sunflower

Results of post-rainy 2012-13 trials in Bellary, Gulbarga, Haveri and Koppal districts showedhigher yields by 23 to 48% over the farmers' practice.

Wheat

In Bijapur and Koppal districts, improved management recorded an increase of 30 to 33% over the farmers' practice.

An economic analysis of whole Bhoochetana program in Karnataka was also done for 3years from 2009 to 2011. Methodology to work out additional benefits over the cost of inputs in actual area of Bhoochetana implementation was adopted. The results were very interesting. The cost of inputs for an area of 11751 ha was Rs.281 lakh during 2009, while value of additional produce due to improved management wasRs. 1429lakhs. During 2010, cost of inputs for an area of 183083 ha was Rs.2254 lakhs and value of additional produce wasRs.22735 lakhs. Similarly, during 2011, the cost of inputs for an area of 581582 ha was Rs.5308 lakhs, while the additional value of produce due to improved management was Rs.65253 lakhs.

During 2012, the cost of inputs for an area of 493101 ha was Rs.6580 lakhs, while the additional value of produce due to improved management was Rs.51765 lakhs. Thus the program led tonet benefits of Rs. 1149 lakhs during 2009, Rs. 20481 lakhs during the year 2010, Rs. 59945 lakhs during 2011 and Rs. 45185 during 2012 which totals to Rs. 126760 lakhs for the state of Karnataka as a whole for a 4 year period from 2009 to 2012.

7 Lessons learnt

Some of the lessons learnt under the programme were as under:

i. Awareness about Bhoochetana technologies has been created in all the districts and farmersadoption levels are increasing.

ii. Seed treatment under assured rainfall condition provides initial strength and vigor tothe crops. Many farmers are undertaking seed treatment voluntarily.

iii. Farmers are convinced that under assured rainfall conditions, supplementation of micronutrients such as zinc sulphate, boron and gypsum along with recommended dosage of fertilizers would certainly increase crop yields remarkably.

iv. Supplementing bio fertilizers and bio pesticides also contribute for yield increase and indirectly encourage eco-friendly farming.

v. Farmers have been convinced of the importance of micronutrients for productivityenhancement.

vi. Bhoochetana Campaigns - motivated the large number of farmers to adopt the seedtechniques and treatment.

vii. Promoted the use of bio-fertilizers, bio-pesticides and green manures which resulted inrevival of soil fertility.

viii. Based on experiences in the previous year monsoon conditions and difficulties in thedistribution of left over stocks in the previous year, officials took a conservative approach of partial stock positioning and accordingly indented for partial requirementof micronutrients, with a view to supply micronutrients as and when the demand arises.

ix. Initially, farmers refused to apply micronutrients. Therefore lead farmers were promoted to use inputs in their plots. The demonstration results weregood and next year these farmers came forward to apply micro nutrients in their field. Suchinnovative approaches have to be adopted in new operational areas.

x. Farmer to farmer communication gave better results.

xi. For achieving the desired impact in terms of increasing agricultural productivity ofdryland systems, small and marginal farmers need to be enabled through training,exposure, demonstrations, ensuring availability of necessary inputs and handholdingsupport.

xii. Timely availability of inputs as well as quality of the inputs are becoming bottlenecks forscaling-up the Bhoochetana in spite of good efforts from the DoA.

xiii. Regular review meetings conducted by DoA are good and showing its impact andDirector and Commissioner has put good efforts which have contributed largely for thesuccess as evident from the results during

Bhoochetana. Similarly regular video conferencing improved the adoption with increased clarity and accountability

xiv. Application of only NPK by way of fertilizer will not yield good results.

xv. Application of fertilizers alone will deteriorate the soil health and in due course the soil will become unproductive.

xvi. Practicing of in-situ soil and water conservation practices are observed as advantages to maintain soil fertility as well as soil structure.

xvii. Use of bio fertilizers like Rhizobium, Phospho bacterial cultures is highly advantageous as they contribute in increase of yield and reduction of cost.

8 Replicability

Bhoochetana initiatives adopted to promote the integrated nutrient management in the soil is a successful venture since the components like use of micronutrients and bio fertilizers have directly benefited the farmers. The per acre cost involved undernutrient management is reasonably low and affordable to the farmers. Thus, the project components are highly replicable. The initiatives are technically feasible, economically viable and socially acceptable and thus, it is highly replicable with certain modifications to suit the changed situations or the areas/locations.

As per the feedback received from the successful farmers interviewed, the improved technology recommended under the Bhoochetana programme is technically feasible and economically viable. The application of micro nutrients has resulted in increased yields. All the farmers contacted have opined positively that the Bhoochetana programme is very useful to the farmers and should be continued. They also indicated that they will continue the use of micro nutrients and improved farming practices to obtain higher yields. The methods and technologies advocated under the programme are simple, farmer friendly and economical. Hence, the programme is sustainable and can be replicated on mass scale for all categories of farmers throughout the State. Some of the areas of replicating the success of the programme are summarized as under:

i. Application of Zinc, Gypsum and Bio Agri gold regularly, is cheaper and helpful in doubling the yield and reduction in cost of cultivation.

ii. The integrated farm technology initiative under Bhoochetana programme adopted by the farmer is technically feasible, financially and economically viable and highly replicable.

iii. As the technology is simple and economical, it is accepted by most of the farmers and thus it is sustainable, at increased productivity level.

iv. The cheaper cropping pattern involving useful crop rotations resulting in better farming systems have immensely improved productivity in each season. Of course, the extent of increase depends upon rainfall conditions.

v. The technologies on soil and water management practices, high yielding varieties /hybrids of seeds, seed treatment, ecofriendly practices like, use of bio-fertilisers, bio-pesticides, predators, gypsum, lime , micronutrients etc. have not only benefited the farmers in increasing their crop yields but also have continuously preserved soil health and thus drastically reduced the cost of cultivation.

vi. Acute shortage of labour and drudgery reduction has been addressed by rapid farm mechanization at various stages of crop growth and thus it is highly replicable with necessary modifications to suit the different locations, changed situations or the areas.

vii. The profitable cultivation of paddy in coastal areas is seen as an exemplary attempt in reviving paddy cultivation, which was earlier seen as a fast diminishing crop being cultivated by farmers in Malnad area.

viii. Timely guidance, training and support from extension staff of the Department has drastically reduced the quantity and costs involved in per acre management of nutrients, pesticides etc. as such, have become affordable to the farmers for easy replication under the programme.

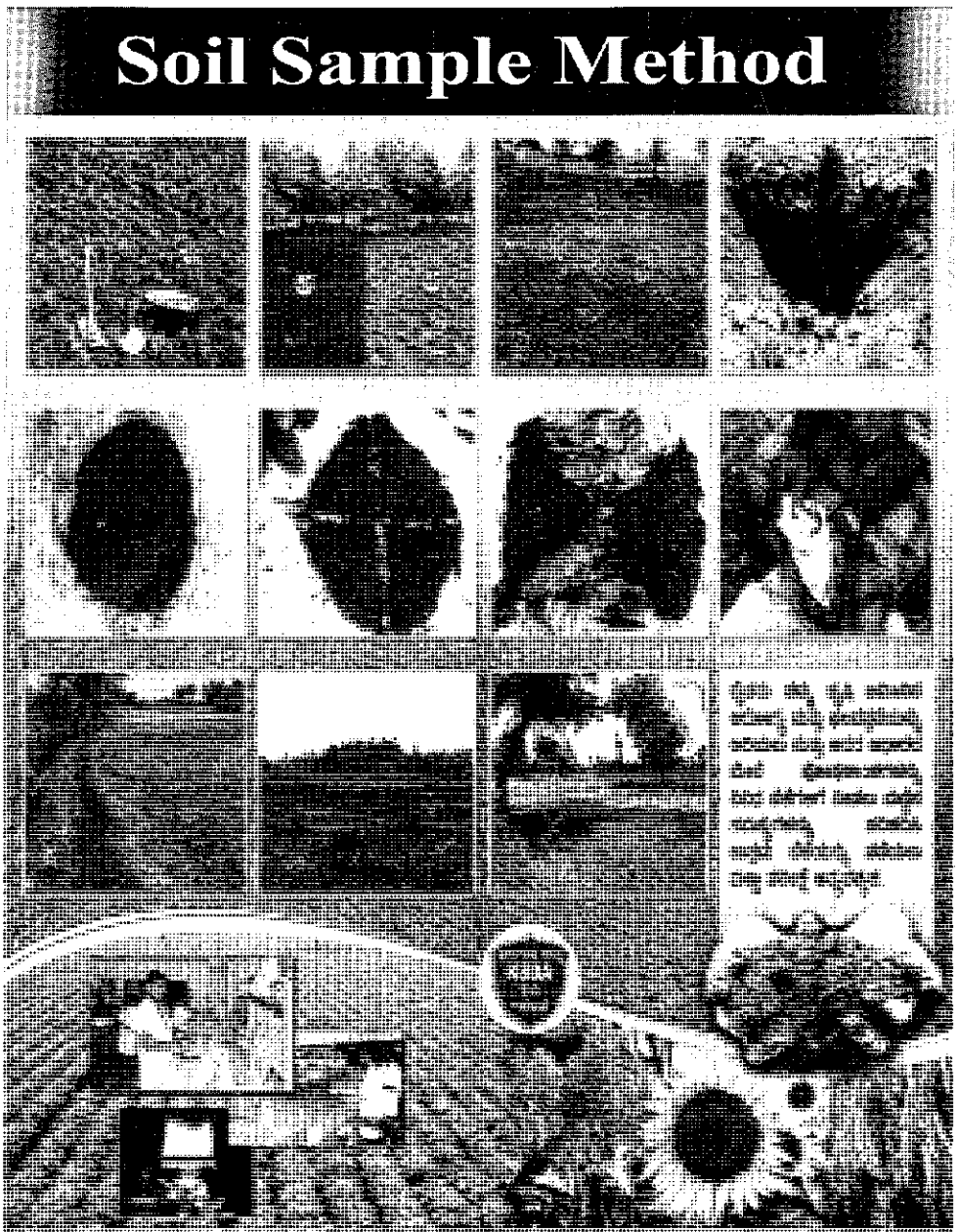
ix. The Bhoochetana technologies are eco -friendly and the implementation of this program is useful in preserving/ protecting the environment.

x. Bhoochetana planned for reviving hungry and thirsty soils is holistic to address all the problems of soils, crops, animals and farmer solely depending on the income from agriculture & agriculture dependent allied activities. It has also helped in promotion of agri business management.

xi. Systematic& scientific crop rotations and mixed cropping have increased cropping intensity under the programme. It is not only high income generating farm activity but also rejuvenating dormant agricultural systems and hence is highly replicable.

Annexure - Success Stories

The success storiesofeightfarmers interviewed during the course of the study across different agro climatic zones/regions of the State, who have adopted the practices advocated under Bhoochetana programme and benefitted by reaping higher yields and incomes are documented and given in the annexure.



BHOOCHETANA SUCCESS STORY - 1
"High Income with Low Cost"

1. Situation before introduction of Bhoochetana

Abdul Saleem, S/o Mahaboob Ali is a young and enthusiastic farmer belonging to Venkasambar village under the jurisdiction of Balichakra Raitha Sampark Kendra (RSK) in Yadgir taluk. He is having 15 acres of dry land and regularly cultivating Tur (Red Gram) in 6 acres and Castor in 6 acres in separate plots with crop rotation every year.Abdul Saleem says that his income was very meagre though he had 15 acres of land.The lack of access to scientific crop husbandry information and non-availability of quality inputs were deterrent factors to increase production and productivity in his land.

2. Challenges

The farmer was not having much access to information on the role of micronutrients in crop production. He had not even physically seen these micro-nutrients of Zinc, Gypsum and Boron as they are seen in the RSKs today. Moreover, these inputs were not available readily in the free market for purchase and there was no advice on its usage and importance in sustaining soil health and crop production. The availability of required quantity of good quality seed was also a problem to the farmers. Abdul Saleem remembers that there was no facility in the village level to guide the farmers on day to day problems faced by the poor and resource poor farmers.

3. Strategies adopted under Bhoochetana

Abdul Saleem came to know about Bhoochetana programme through an awareness programme conducted by Balichakra RSK staff in his village. The main strategies adopted by the farmer are as indicated below.

- Replacement of seed variety (Introduction of TS3R in place Gulyal and Tur crop).
- Participation in training programmes conducted by the Dept. of Agriculture.
- Application of micronutrients (Zinc @ 2.5 kg per acre costing `60/- Gypsum 50 kg per acre costing `100/-).
- Application of organic fertilizers (Bio-Agri Gold 100 kg per acre costing Rs 240/).
- Seed treatment with bio-fertilizers (200gfor every 10 kg seed)

Abdul Saleem consulted with RaithaAnugar of village Venkasambar, who told him about the advantages of using micro-nutrients and also about the supply of inputs in RSK Balichakra at subsidized cost under Bhoochetana. Abdul Saleem approached RSK Balichakra and purchased micronutrients, BioAgri gold and TSR3 variety of Turseeds etc. by availing the facility of subsidy on above mentioned inputs. During the year 2011-12, he applied all these inputs to the Tur and Castor fields.

He did not apply DAP or Urea this time since he had applied the above mentioned bio-fertilisers, the cost of which was `400/- per acre and for the entire 12 acres the cost worked out only to `4800/- as against expenditure of `12000/- to `14000/- in the traditional practice of using nitrogenous fertilisers of DAP and Urea. Thus, there was a cost reduction to the tune of 62 % on account of micro-nutrient application in Castor and Tur crop production.

(Sri Abdul Salim sharing his experience of the integrated approach of Bhoochetana that enabled him getting higher yield in Tur and castor crops at a low cost on 5-3-2014)

4. Results achieved

He used to apply 3 bags of Di Ammonium Phosphate (DAP) mixed with 20 kg of Urea to each of the Tur and Castor crops incurring an expenditure of `6000/- to 7000/-

for each crop (total of `12000/- to 14000/- for both crops in 12 acres per annum). He used to spend another `2000/- to `3000/-towards plant protection chemicals for both the crops. Thus the total expenditure incurred on fertilizer and plant protection measures was `14000/- to 17000/- in his farm. He used to get only 2 quintals of Castor andTur each with the cultivation practices followed.

The yield now obtained in Tur was 24 quintals and that of castor was 24 quintals as against 12 quintals each during previous years. The incremental yield by using micro-nutrients and Bio Agri gold was 50% more than the traditional DAP fertilizer application. Sri Abdul Saleem shared his experience on the results achieved and attributed the yield increase to the following initiatives taken up by him under Bhoochetana.

- Participation in all the training programmes of RSKs and as result receiving getting technical inputs on crop husbandry.
- Getting regular technical information from farm facilitators
- Replacement of seed of Tur crop with TS3R
- Application of micronutrients and Bio-fertilisers
- Cost of production has reduced and profitability has increased by way of low cost as well as increase in crop yield.

5. Results anticipated

Abdul Saleem has indicated that application of Gypsum in the soil of his farm would improve the soil structure as observed already. Farmer anticipates that there would be stability in yield of thecrops grown by him and the status of productivity will enhance by continuing the initiatives of Bhoochetana.The yield per acre of the Tur and Castor can be easily increased by another 20-25%.

6. Sustainability

Shri Abdul Saleemfeels that the techniques used by way soil application of micronutrients has strengthened the soil health and has demonstrated the increment in crop yield. There would be facilities for getting access to information through the officers of RSKs as well as through Farm Facilitators round the year. The initiatives are sustainable because of their economic viability and Technical feasibility.Integrated approach is also a factor for sustainability of the programme.

7. Lessons learnt

Farmer, Sri. Abdul Saleem has learnt a lesson that a steady increase in crop yield is possible only through integrated nutrient management by using micronutrients and by use of organic fertilizers.

8. Replicability

Sri Abdul Saleem is using Zinc and Gypsum since 2011-12 and has continued till 2013-14. He says that he will not stop this practice since application of Zinc, Gypsum and Bio Agri gold are cheaper and helpful in doubling the yield and reduction in cost of cultivation.

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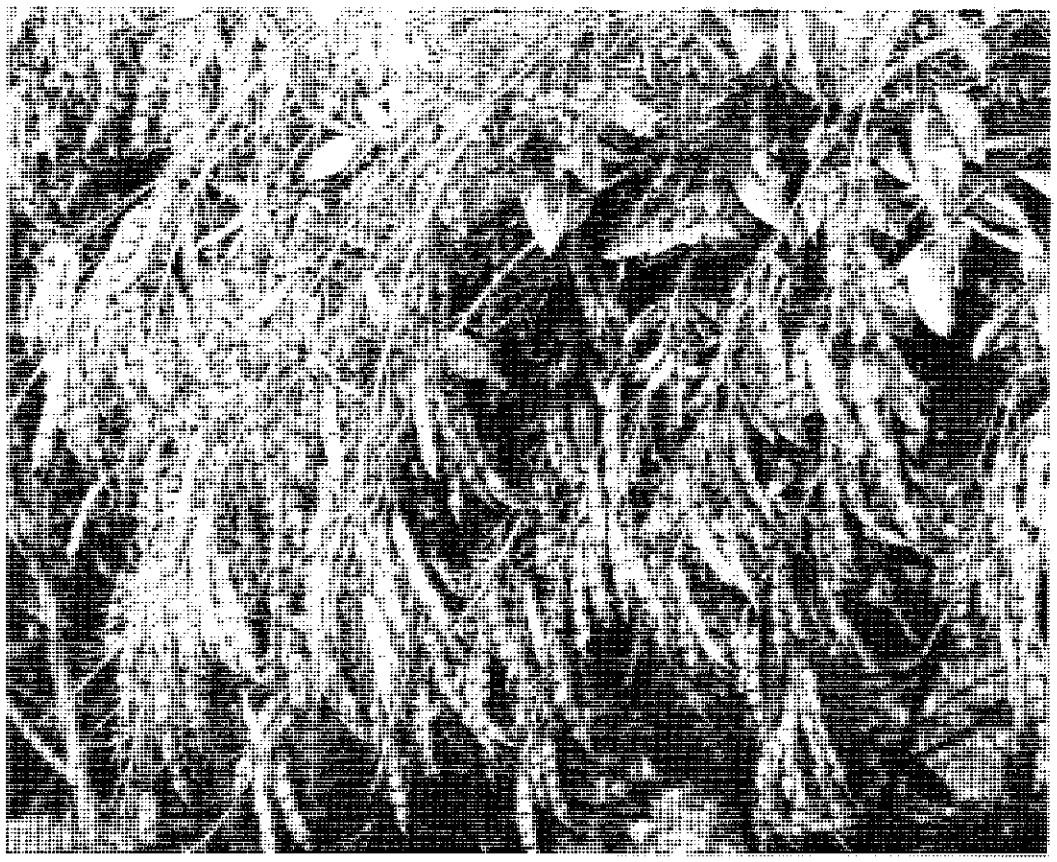

BHOOCHETANA SUCCESS STORY - 2

"Oil Content in Groundnut Increases with Application of Gypsum"

1.Situation before introduction of Bhoochetana

ShriChandrappaKumbar is a medium farmer belonging to Madhwar village under RSK Balichakra in YadgirTaluk. He has only 4 acres of land and every year he used to grow 1 acre of groundnut under irrigated condition (well irrigation) as summer crop. He had no information on latest cultivation practices on integrated nutrient management. He did not participate in training programmes as he was not aware about them. The yield of groundnut from his farm was only 15 bags of 35 kg each prior to adoption of improved practices under Bhoochetana.

2. Challenges

He faced the following challenges for adopting better cultivation practices for groundnut.

- Lack of awareness programmes.
- Non-availability of inputs through subsidized rates.
- Loss in yield due to insect and pests attack because of lack of knowledge on IPM.
- The fear of adverse effect on soil and crops by use of micronutrients.
- Non-affordability of benefits to small, marginal and socially disadvantage groups.
- Lack of knowledge on method, dosage and time of application of micronutrients.

3. Strategies adopted under Bhoochetana

About two years back, he came to know about the Bhoochetana programmeof RSK Balichakrain YadgirTalukand followed the strategies as under:

- Participation in training programme organised by the Dept. for Bhoochetana.
- Application of Gypsum 100 kg per acre as recommended by the officials of RSK.
- Application of organic fertilizers (Bio Agri gold 100 kg per acre).
- Seed treatment with bio-fertilizers.
- Taking the help of farm facilitator in soil and crop management.

4. Results achieved

Sri Chandrappa shared his experience of integrated efforts in cultivation of groundnut as indicated below.

- Obtained 20% increased yield of 18 bags of 40- 45 kg as against 15 bags of 30-35 kg.
- Increase in pod weight by 16% as a result of increase in oil content of the kernels (based previous and present groundnut bag weight).
- Improvement soil structure due to use of Gypsum.
- Knowledge up gradation in crop management.

5. Results anticipated

- Introduction of new vaerities of crops also added to the increased yield and enhancement of income.
- Promotion of organic forming through large scale introduction of bio Agri gold and city compost.
- Creation of seed bank in the village through formation of groups. Achieving 100% adoption of micronutrients by continuing the present efforts.

6. Sustainability

The soil fertility management through application of micronutrients has successfully demonstrated an increase in yield levels of Groundnut. The farmers is convinced about the application of organic matter like bio Agri gold and city compost, which is available at affordable cost. The method of technology transfer and service provided by RSK has facilitated in infiltration of technology among the farming community and thus the initiatives taken are sustainable.

7. Lessons learnt

- ❖ Realizing the importance of micronutrients and organic inputs in crop production.
- ❖ Realizing the importance of training programmes conducted by RSK and farm facilitator.
- ❖ Understanding the ill effects of chemical fertilizers on soil structure.

8. Replicability

The integrated technology under Bhoochetana programme adopted by the farmer is technically viable and economically feasible and the initiatives are highly replicable. The farmer said that he would continue the practice in future also.

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BHOOCHETANA SUCCESS STORY - 3
"Innovative Practice of Triple Cropping"

1. Situation before introduction of Bhoochetana

Shahapur Taluk of Yadgir district lies in the north eastern dry zone of Karnataka. Doranalli village and RSK are located in ShahapurTaluk at 15 km away from Shahapur. Bajra is a traditional crop before the area was brought under upper Krishna irrigation project and still farmers continue the cultivation of this crop under uncommand and other dry lands. The Department of Agriculture in the taluk had been motivating the farmers through different initiatives like demonstrations, training and other subsidy oriented incentive programmes prior to Bhoochetana programme. But there was lack of concentrated efforts to popularize the use of micronutrients, new farm machinery for use by large number of farmers. The farmers did not venture into new cropping pattern due lack of knowledge and confidence. Bajra is a Kharif crop sown during June and harvested during August-September in Doranalli and surrounding area. Likewise Groundnut is usually sown either in June- July as summer crop and harvested during January-February.

2. Challenges

- Non-availability of data on cultivation of triple crops in dry land.
- Discouragement by co-farmers to practice the non-traditional innovative practice.
- Lack of awareness programmes.
- Non-availability of inputs at subsidized rates.

3. Strategies adopted under Bhoochetana:

About two years back, he came to know about the Bhoochetana programme of RSK Balichakra and followed the strategies for farming as indicated below.

- Participation in training programme.
- Adoption of sprinkler irrigation for protective irrigation
- Taking the help of farm facilitatore.

(Summer Bajra crop in the same field followed by Bajra and groundnut in Kharif and Rabi respectively)

4.Results achieved

As a result of capacity building, some farmers of Doranahalli and surrounding villages have found out a system of 3 crops a year in the same field. The beneficiary farmer said that if early rains occur during May - June, he would sow Green gram and the crop will be harvested during last week of July. After cleaning Green gram fields, the farmer will go for Groundnut during July-August (not a season normally advocated for groundnut cultivation) and the Groundnut is harvested by January and after cleaning the fields he takes up Bajra during February and harvest the Bajra during April.

The farmer attributes 3 favorable situations for evolution the above practice in the area:

- Early rainfall during May - June, sufficient for sowing the crop.
- Application of micronutrients to replenish the soildeficiency caused by continuous cultivation of 3 crops in the same field. The micronutrients are available at subsidized rates in RSK throughout the year.

- Availability of sprinkler irrigation system at subsidized rate through RSK Doranahalli.

The advantages of the practices followed by the farmer are:-

- Getting 3 crops in the same field in the same year without deterioration of the soil fertility by application of FYM, Zinc, and Gypsum for the field.
- Increasing the income of the farmer.

5. Results anticipated

- Finding Groundnut varieties suitable for July-August sowing with the help of scientists.
- Coverage of more area under the initiative.
- Conducting operational research on the innovative practice.

6. Sustainability

Since technology adoption brings the farmer more income without causing any soil or land hazards the practice is found to be sustainable.

7. Lessons learnt

- Possibility of 3 crops in a year in the same field.
- Possibility of trying other dry land crop for multiple cropping.

8. Replicability

As the technology is simple and economical, it is accepted by the most of the farmers and thus it is sustainable.The farmers said that this type of cropping cycle will be followed next season depending upon the receipt of early rains during May.

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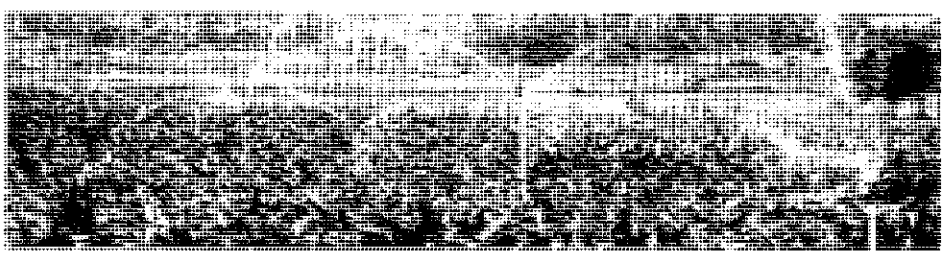

BHOOCHETANA SUCCESS STORY - 4
"All Smiles - Little Late Than Never"

The success story of Shri Krishnamurthy K.Ganadakatte, of Channagere taluk of Davangere Dist. has been documented in following paragraphs based on information collected from Shri Krishnamurthy and obtained confirmation from Department of Agriculture.

1. Situation before introduction of Bhoochetana:

The farming practicesfollowed or existed before the implementation of Bhoochetana were as under:

- He did not know much about soil and water conversation activities.
- He did not know much about good quality and high yielding variety of seeds.
- He did not know much about Integrated Nutrient Management (INM) (use of micro-nutrients)
- He did not know much about uses of Bio-fertilizers and bio-control agents.
- He did not know much about Seed treatment.
- He did not know much about need and Uses of Soiltest and Soil Test health card.
- He did not know much about the RaithaSampark Kendra (RSK) as there is acute shortage of staff and there was no concept of Farmer Facilitators to guide the farmers.
- Farmer was rarely visiting RSK before implementation of Bhoochetana Programme.
- He did not know much about the importance of Mixed Cropping or rotation of crops.
- Availability of inputs or attitude of Agriculture Department officials towards farmers was not good.
- He rarely attended any training programmes conducted by Dept. of Agriculture.
- The cost of cultivation is more due to use of DAP and Urea.
- Low Productivity and income before Bhoochetana.

2. Challenges Encountered

Farm Facilitators and Agricultural Officers, Agriculture Department are working as innovators for popularizing the Bhoochetana Programme. Farmers are not readily accepting the change in cultivation. Farm Facilitators and officers of Agriculture Department have to work hard to convince the farmers to adopt the Bhoochetana.

3. Strategies adopted

Shri Krishnamurthy is a progressive and open minded farmer and accept the new innovations to increase the productivity. The Strategy adopted by Shri Krishanamurthy for increasing the productivity and financial position are as under:

- Covered all 6 acres in Bhoochetana: ShriKrishnamurthyhas convinced that use of micronutrients under Bhoochetanawill bring not only increased productivity ranging from 10% to 30% depending upon the rain but also increased the quality of the crops. Therefore, he covered all 6 acres in Bhoochetana.
- Used improved and high yielding varieties of seeds.
- Adopted seed treatment.
- Used micronutrients and fertilizers as required by soil test.
- He has adopted mixed cropping and Change in cropping Pattern.
- He has attended all training programmes arranged by Farmers Facilitators and KrishiMela.

4. Results anticipated and achieved

Shri Krishnamurthy by following the above strategy achieved the following results:

4.1 Increased productivity and income

Farmer has grown Arecanut (5 acre) & vegetables (one acre) and applied the micronutrient. After using micronutrients, productivity of Arecanut and vegetables were increased by 25% and 22% respectively.

4.2 Reduction in cost of cultivation

After Bhoochetana, cost of cultivation has come down substantially as he has reduced the use of DAP, Urea and increased the use of micronutrients -Gypsum, Zinc Sulphate and Borax.

4.3 Increase in productivity

After Bhoochetana, percentage of increase in productivity stood at maize -20%, Ragi-20%.

4.4 Increase in Net Income

Total net income of the farmer which stood at Rs 130000 for the year ending 2009-10 has increased to Rs 167600 indicating growth of 29%. The net income from remaining 5 acres stood at Rs 150000.

4.5 Increase in Standard of Living

As the net total income of the farmers increased, financial status and standard of living of the farmers has also increased, after Bhoochetan

4.6 Increase in Awareness

After Bhoochetana, awareness of the farmer about the agriculture has increased due to various training and capacity building programmes conducted under Bhoochetana.

5. Sustainability

The soil fertility management through application of micronutrients has successfully demonstrated a steady increase in yield levels of crops. The farmers are convinced about the application of organic matter like bio Agri gold and city compost which is available at affordable cost. The method of technology transfer and services provided by the officials of department of agriculture, periodical trainings imparted by KrishiVigyanaKendras (University of Agricultural Sciences, Bangalore) created technical Supports like Soil Test Based fertilizer/nutrients recommendations and other training support from ICRISAT have facilitated infiltration of technology among the farming community. The importance of seed replacement is well realized and thus the farmers would find measures to produce and preserve quality seeds either on individual initiative or on group basis. The advantages of seed treatment with bio agents have been well recognized and with the advantages of easy availability seed treatment materials, farmers will continue the practice of seed treatment.

The increased productivity is therefore, reached under Bhoochetana is sustained or continued under normal conditions. Farmer further said that not only productivity sustained but he also observed increase in productivity every year. The extent of increase of course depend upon the timely receipt of rainfall. However, the deficiencies in rainfall did not marked by reduce the crop yields as there was improvements in moisture holding capacity of soils due to modified soil structure resultant improvements in moisture /water holding capacity (WHC) over cropping period.

6. Lessons learnt

Shri Krishnamurthy said that he has learned following lessons:

- He now knows about soil and water conservation activities.
- He now knows about good quality and variety of seeds.
- He now knows about Integrated nutrient management (use of micro-nutrients)
- He now knows about uses of Bio-fertilizers and bio-control agent
- He now knows about Seed treatment.
- He now knows about need and Uses of Soil test and Soil Test health card.
- He now knows about the RaithaSampark Kendra (RSK) and visits RSK regularly.
- He now knows about Farm Facilitators.
- He now knows about importance of Mixed Cropping and Changing crops
- He now knows how the cost of cultivation can be reduced.
- He now knows "Do's and Don'ts in cultivation" He now knows that application of fertilizers alone will deteriorate the soil health and the soil will become unproductive in future.
- He now knows that Practicing of in situ soil and water conservation practices are observed as advantages to maintain soil fertility as well as soil structure.
- He now knows that the use of bio fertilizers like Rhizobium, Azospirillum cultures are highly advantageous as they contribute in increase of yield and reduction of cost.
- Application of only NPK by way of fertilizer application will not yield good results.

7. Replicability

Dry lands are not only hungry but thirsty as well. Taking the lessons learned from "Sujala" an integrated participatory watershed development programme,

Bhoochetana Initiative adopted to promote development of forming systems involving development of location specific cropping systems deriving heavily on innovations in agriculture leading to useful remunerative new technologies. These

technologies included soil and water management practices, high yielding varieties /hybrids of seeds, seed treatment, ecofriendly practices, like employing bio-fertilisers, Bio-pesticides, predators, gypsum, lime , micronutrients etc. have not only benefited the farmers in increasing their crop yields without deteriorating soil health but also drastically reduced their cost of cultivation. The recent trend of migration of rural youths away from farming which resulted in acute shortage of manpower has also been addressed by rapid farm mechanization at various stages of crops growth. The initiatives are therefore, technically feasible, economically viable and socially acceptable and thus it is highly replicable with modification to suit the changed situations or the areas. Any new farmer therefore, can adopt the Bhoochetana and he can increase the productivity and he will get all benefits of Bhoochetana. Farmer said that around 50-60 % of his villages are still not covered under this scheme and suggest that 100% of farmers should be covered under this programme.

8. Conclusion

Shri Krishnamurthy exclaimed that if this programme was to come 10 years back, his situation would have been different altogether!

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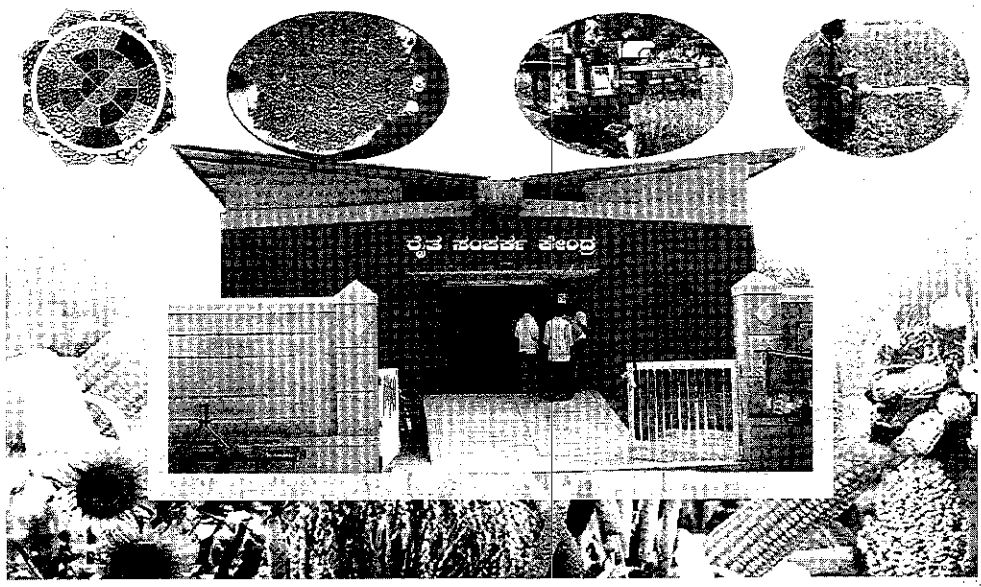


BHOOCHETANA SUCCESS STORY - 5
"Revival of Paddy –Malnad Shows the Way"

Annegowda s/o Subbegowda, from MugraHalli of Mudigeretaluk of Chickmagalur Dist.is a farmer with progressive thinking and attitude. Over a period he has brought a kind of revolution in paddy cultivation and his achievement is a replicable success story.

He has 25 years of experience in paddy cultivation. He is categorized as small farmer with 3 acre of paddy land and 1.34 guntas of coffee. He has shown time and again that paddy cultivation is profitable venture and farmers should continue to cultivate paddy, which is fast vanishing in Malnad area.

1. Situation before Bhoochetana

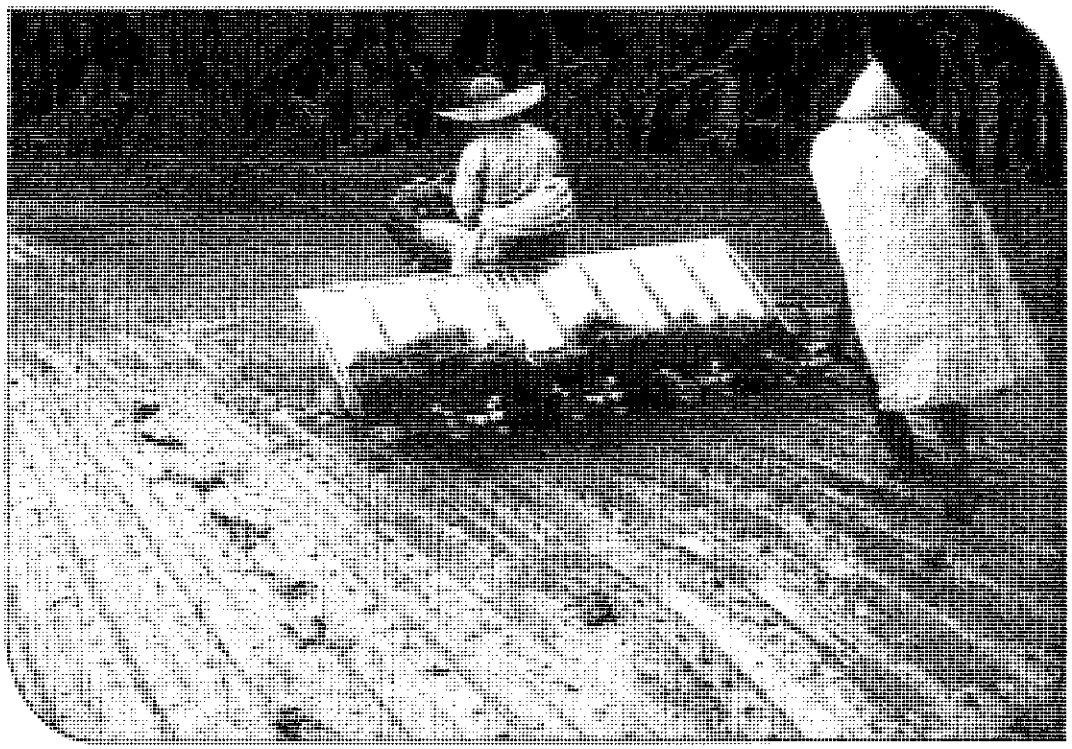
Annegowda was following traditional methods of paddy cultivation prior to 2009 using local variety of paddy known as 'Dappa Bhatta' and hardly was able to get 8-10 quintals of paddy per acre. Expenses were high due to manual operations of cultivation and increasing wage rates. This led to continuous losses. As a result Annegowda was a worried lot and decided to bring in certain changes in cultivation.

2. Challenges faced

Annegowda had two issues to be sorted out. One is increasing cost of cultivation and stagnant yield levels resulting in continuous losses from paddy cultivation. He then decided to adopt two pronged strategy.

3. Strategy Adopted

Annegowda's first concern was to increase the yield of paddy crop. For that he approached Agriculture Department for the first time in 2009 and got new variety of seed known as 'Thunga (IET13901) and got one ton of agri lime. ***The same year he decided to bring in usage of power tiller and transplanter.*** Again in 2012, the farmer used herbicides to avoid weed growth. When he found that labour shortage had become acute he introduced reaper for harvesting.Thus these changes/innovations adopted in paddy cultivation changed his destiny.



4. Innovations

Traditional Method	New Method Adopted
Ploughing by Bullocks	Ploughing by Tractor/Tiller
Local variety seed	Hybrid variety-IET Sanna/ Thunga(IET 13901)
Transplantation-manual method	Use of transplanter
Nursery bed(30-40 nursery bed)	Nursery bed BT Mat system
Farm yard manure after one month of transplantation	FYM spread within 8-10 days of transplantation
Weeding by manual labour-hand weeding	Use of herbicides-Butachlor (pre-emergent herbicide
Use of chemical fertilizers after months of first weeding	Use of chemical fertilizers after two two months of herbicide spray
Pesticide spray-infestation observed	Pest incidence almost 'nil'
Less number of tillers	Maximum number of tillers per plant
Manual harvesting	Use of reaper for harvesting
Tractor threshing	Tractor threshing
Manual winnowing	Winnowing by tillers using fans
Yield per acre-15 quintals	Yield per acre-25 quintals per acre

Annegowda further started judicious use of fertilizers. Earlier he put 3 bags of urea; 3bags of potash. Now he used 3 bags of complex; 3 bags of potash; and 30 kg urea for his 3 acre paddy land. His land is also very fertile with red loamy soils and he has laid proper bunding in his land. He is also blessed with natural fertility of soil; over

flowing water of HemavathyRiver during rainy season brings in fertile soil from upper reaches of the river.

5. Results anticipated and achieved

Introduction of agriculture machinery and judicious use of inputs by Annegowda helped him to overcome the challenges and made paddy cultivation a profitable agricultural avenue. The anticipated results wereachieved in terms of savings in cultivation.

The actual yield and productivity attained wasalmost at the level of doubling the average yield anticipated. Usage of high yield variety of seeds, timely operation and use of machinery, preventing wastages, judicious use of inputs were the main reasons for improving the productivity. In addition, it is also due to recommended seed rate, plant spacing, and optimum number of plant population and sprouting of maximum numbers of tillers.

6. Sustainability

Initially the neighboring farmers of Mr. Annegowda were critical of him for using agriculture machinery especially Transplanter and raising of seed bed by mat system. But when they found that his paddy field had come up like their own they were surprised. Further when he used herbicide for controlling growth of weeds, they were again critical of him. But when they saw no weeds in his field and they had to engage labourers repeatedly, it was a lesson for them. Now they have also started following him to find that his methods have earned profits for them.

7. Lessons learnt

- It is a clear demonstration that following proper package of practices, timely operations, judicial use of inputs, mechanization of farming results in profitable agriculture and proper spread of this message and demonstrations would save cultivation of paddy in Malnad areas.
- Usage of agricultural machinery and implements have proved to be a great boon, as enormous laboursaving device in terms of cost saving in cost of cultivation by half. In this case it is to the tune of Rs.27,875 for 3 acres.
- The farmer could use machinery on hire since they are all available in Mudigere which is nearby. Such facility should be made available in other places like Kalasa, and interior parts of Malnad areas to sustain paddy cultivation as profitable venture

- Increase in fodder availability ensures maintenance of dairy animals which is an encouraging factor and gives additional income to the farmer.

8. Replicability

- The profitable cultivation of paddy by Annegowda in Banakalhobli is seen as an exemplary attempt in reviving paddy cultivation in Malnad area which is fast vanishing.
- Annegowda is seen as a progressive farmer and is invited to various meetings to provide guidance to the farmers and others have followed.
- Replication of such practices is possible at a rapid pace when the department of agriculture pays specific attention in providing all types of inputs under Bhoochetana scheme to all farmers indulging in paddy cultivation including Mr. Annegowda.
- Provide sufficient irrigation facilities where possible to encourage farmers to continue paddy cultivation as a second crop since it is seen as a profitable occupation

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BHOOCHETANA SUCCESS STORY- 6
"Green Revolution Under Limited Moisture Conditions"

ShriVeerappa B Bannur of Rattihalliof Hirekarurtaluk of Haveri District has been implementing the Bhoochetana program successfully and has reaped good benefit. The success story of ShriVeerappa was documented based on the information gathered from him and the same was confirmed by the department of agriculture, Hirekarurtaluka. ShriVeerappawas covered under Bhoochetanafrom the year 2011-12. He has cultivatedmaize (CP 818) under rain fed farming. The best practices adoptedby him under program are summarised below:

1.Situation before Bhoochetana

Prior to Bhoochetana programme ShriVeerappa did not have any knowledge about soil and water conservation activities. There was low productivity and hence low income prior to Bhoochetana.

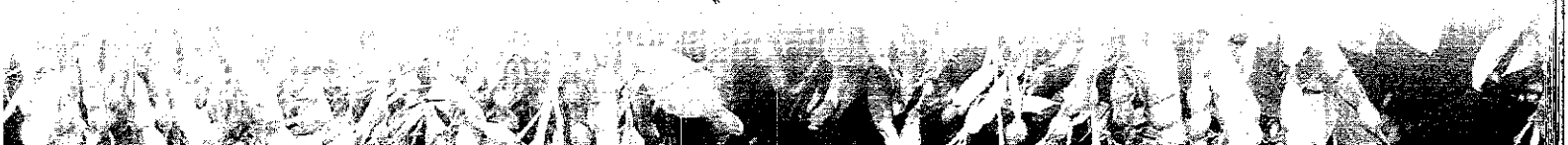
2. Encounters and challenges

Prior to implementation of the BhoochetanaShriVeerappa did not contact or had any support from the department. He did not have any knowledge of soil fertility, seed preservation and HYV/hybrid seeds, balanced usage of bio fertilisers/pesticides. Although initially, ShriVeerappa had resistance on the use of micro nutrients later on, was convinced about the uses of it for improving production and productivity. ShriVeerappa took active participation in Bhoochetanaprogrammes and had good support from Farm Facilitators and agricultural department working for the success of the programme.

3. Strategy adopted

ShriVeerappa is a progressive farmer and readily accepted the innovations in agriculture and adopts in crop cultivation in his farm. The strategies adopted by him are as follows:

- ❖ High yielding variety of improved crop viz. maize (CP818) as per recommended seed-rate was employed.
- ❖ Adopted mixed cropping with red gram
- ❖ Instead of applying only chemical fertilizers applied gypsum, zinc sulphate, borax and compost. Also used microbial cultures like



Trichoderma for seed treatment, PSB and Azospirillumfor soil application. Chloropyriphos and neem oil (a bio pesticide) were used for control of pests. treatment, PSB and Azospirillumfor soil application. Chloropyriphos and neem oil (a bio pesticide) were used for control of pests.

4. Results anticipated and achieved

The farmers generated improved production and income under the programme. Maize crop grown prior to Bhoochetana yielded only 23.5 quintals / acre while the Bhoochetana plot yield was 29 quintals / acre resulted in 23% increase in grain yield. At the prevailing price of Rs 10.50/ Kg, an additional income of Rs 8000/ acre was realized. Other achievements were as under:

4.1 Reduction in Cost of Cultivation

As there was usage of gypsum, micro nutrients, compost, bio fertilizers and bio pesticides usage of chemical fertilizers and pesticides was minimum. This brought down the cost of cultivation drastically.

4.2 Eco friendly Practices

The cost of cultivation was marginally increased but the practices followed were Eco friendly causing minimum damage to ground water as the use of chemicals as fertilizer and pesticides was lower.

4.3 Improvement in Standard of Living

Increase in total income has enabled farmer to have better schooling and health facilities to his family members and own power tiller which reduced drudgery during farm operations.

4.4 Improvement in Awareness Levels

His knowledge and skills improved remarkably due to trainings and capacity building exercises duringBhoochetana period. Now, he knows as to where the improved seeds of good varieties and other inputs could be procured.

4.5 New Initiatives

He has started composting his crop residues/ farm waste employing earth worms. Hence, he meets his requirements and also provides earthworms to neighboring farmers.

5. Replicability

The costs involved in per acre management of nutrients, pesticides etc. are drastically reduced and hence are affordable by the farmers. Further the program does not revolve on complicated technologies.The practices being propagated under the program are easily replicable.The technologies are Eco friendly and the acceptance of this program is useful in preserving/ protecting the environment from pollution.

6. Conclusion

ShriVeerappa finally advocates the large scale adoption of the Bhoochetana practices so as to usher in ever green revolution even under limited moisture conditions.

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BHOOCHETANA SUCCESS STORY - 7
"Holistic Approach to Revive Acidic Soil for Paddy Crop"

This is a success story of Shri TimmaTimmaNaik of Kolar village of Siddapur taluk of Uttar Kannada District, cultivating paddy crop. During interaction with him he indicated that he has been richly benefitted with improved financial position through increased productivity of paddy crop with support and benefits extended under Bhoochetana programme

1. Situation Prior to Bhoochetana

ShriNaik who is 58 years of old with 7 family members, is 58 years old and educated up to 4th standard, owns 3 acres of cultivable land. For implementing Bhoochetana the department has chosen his village during 2011-12 and Shri TimmaTimmaNaik was one among 300 farmers. The success story of Shri Naik is documented based on the information collected from the farmer and the department of agriculture. The practices before the implementation ofBhoochetana were as under:

- He does not know much about the land and water management practices , good qualities and high yielding verities of seeds, integrated nutrient management practices especially use of micro nutrients , use of bio fertilizers and bio control agents, seed treatments, use of soil test results , raithasamparkkendra, FFS.
- Loss of cultivation is higher due to use of heavy doses of urea for paddy.
- Low Productivity and income before Bhoochetana

2. Encounters and Challenges

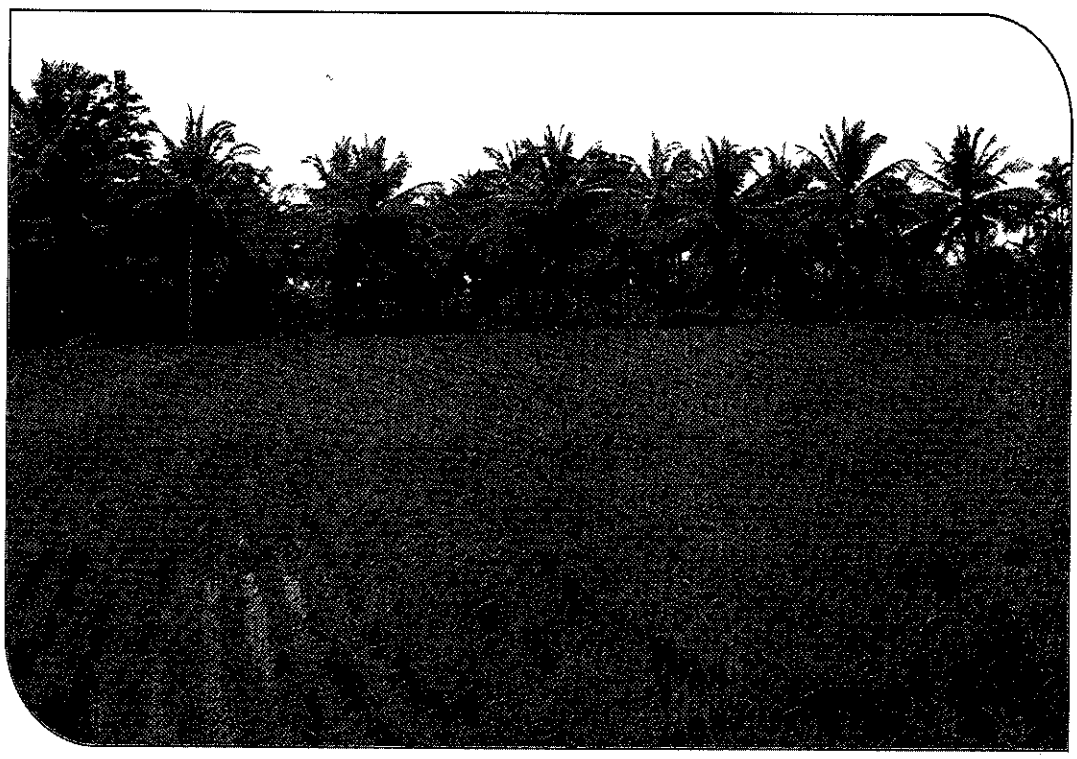
Farm facilitators and officials of agricultural department are working as an innovator for popularizing the scheme. However, farmers were not prepared to readily accepting the changes. Agricultural department and FFswere required to puthard work to convince the farmers on the positive aspects of Bhoochetana programme.

3. Strategy adopted

The Strategies adopted by ShriTimmaTimmaNaik to adopt new innovations are as follows:

- Covered all the 3 acres of his land under Bhoochetana.

- Employed improved seeds of high yielding variety of paddy.
- Live planting (Transplanting) of paddy seedlings.
- Use of lime for reclaiming soil acidity and zinc sulphate and borax to provide two critical micro nutrients.
- Employing power tiller for land preparation and other cultivation practices , weed cutter purchased is used for cutting weeds and using them in composting. Used cone weeder for the weeding hill paddy plax which reduced drudgery and to hide over problems of labour shortage.
- Participation in all the training programmesorganised by the department of agriculture.



4. Results Achieved

ShriTimmaTimmaNaik has achieved the following results after adhering to the strategies indicated above:

4.1 Increased productivity and their income

Total Agriculture Income prior to Bhoochetana: Rs.45672. Net agriculture income :Rs 45672- Rs18000 (Exp)= Rs.27672

Total Agriculture Income after Bhoochetana Rs.61320

Net Agriculture IncomeRs. 61320- Rs.19500 (Exp) = Rs41820

Net increase in Agriculture Income afterBhoochetana over conventional method: Rs. 41820-Rs. 27672= Rs. 14148

ShriTimmaNaik has earned net agriculture income of Rs 14,148 in his 1.2 acres of land from his paddy crop on account of improved farming practices under Bhoochetana.

4.2 Eco friendly practices

The cost of cultivation was marginally increased but the practices followed were eco-friendly causing mimimum damage to ground water as the use of chemicals as fertilizer and pesticides was lower.

4.3 Improvement in Standard of Living

Increase in total was income has enabled farmer to have better schooling and health facilities to his family members and also to own a power tiller which reduced drudgery during farm operations.

4.4 Improvement in awareness levels

His knowledge and skills improved remarkably due to trainings and capacity buildings exercises during Bhoochetana period. Now he knows as to where the improved seeds of good varieties and other inputs could be procured. He is now recognized as a progressive farmer in his village.

4.5 New initiatives

He has started composing his crop residues/ harm waste employing earth worms. Hence he meets his requirements and also provides earth worms to neighbouring farmers.

5. Sustainability

Benefits accrued under the Bhoochetana are highly sustainable as the usage of gypsum/ lime modified soil physical properties and application of zinc, borax and also organics to soil has left positive effects. Residual moisture, residual nutrients

after the harvest of paddy crop enabled farmers to take another short durations pulse crops. The modified soil conditions will also help in tiding over moisture stress over crop growing period.

6. Lessons Learnt

Now the ShriTimmaTimmaNaik knows about places from where good quantities of seeds, inputs are available, integrated nutrient managementincluding micronutrients, use of bio fertilizers, bio pesticides, bio control agents, seed treatments, soil test and based fertilizer application, RSKs, value of crop rotation in improving and sustaining crop yields.

7. Replicability

Bhoochetana planned for reviving hungry and thirsty soils is holistic. Address all the problems of soils, crops, animals and farmer depending on all these. Hence it is replicable as there are increased crop yields, grown on healthy soils, water management problems addressed.

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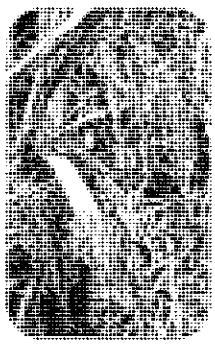

BHOOCHETANA SUCCESS STORY - 8
"Paddy Crop Through Soil Enriching and Decomposition"

Sri RamadasKannyaGowda of Tattimule village of Adukolahobli at Honnawartaluk of Uttara Kannada District, isa successful farmer who has implemented Bhoochetana programme and harvested rich benefits by cultivation of paddy crop. The programme has brought positive financial gains to him as it remarkably improved the crop productivity. He is a young dynamic and enthusiastic farmer of 39 years of age and supports six members of his family by cultivating paddy and horticulture crop in his 3 acre of land. The Bhoochetana programme is implemented by ShriRamadas from 2011-12 in the village and is reccognised as a progressive farmer of the village.

1. Situation before Bhoochetana

The situation of the farm level operations of Shri Ramadas, prior to the implementation of the Bhoochetana programme was as under:

He did not have adequate knowledge of :

- Soil and water conservation practices
- Good quality and high yielding varieties of seeds
- Integrated nutrient management (micronutrients)
- Use of bio control agents and bio fertilizers
- Seed treatment
- Employing soil test results based fertilizer recommendations
- Facilities available in RSKs, information from farm facilitators
- Low productivity and low income levels were the common

Prior to Bhoochetana programme the income level of Shri RamadaswasRs 19000/ acres from value of produce (grain + fodder). After Bhoochetana programme his income level rose to Rs. 34840 from the same piece of one acre land. In addition he got 15000 from dairying also. Thus he has reported income of 32000 also from off farm activities.

2. Encounters and Challengers

Officials of agriculture department with the assistance of farm facilitators are

working as innovators for propagating this useful scheme. But bearing the risk of dry land farming are not readily accepting the changes. It is heartening to note that the staff of agriculture department are making concerted efforts in convincing the farmers of their distinctive advantages of Bhoochetana programme in improving productivity of crops, soils and animals without causing deleterious effects on soils.

3. Strategy adopted

Shri Ramadas KannyaGowda is in lead in accepting the new and innovative farm practices. Strategy adopted by him are as follows:

- Of the 3 acre he owns 1 acre was covered cropped to paddy , under Bhoochetana.
- Sown high yielding variety of paddy.
- Line planting of seedlings
- Lime used for reclaiming the soil acidity. Zinc sulphate and borax to provide two critical micronutrients.
- Employed power tiller corn weeder and weed cutter for farm operations. This helped in reducing drudgery in farm operations and saving time. Problems of scarce labour were also circumvented with ease. Weeds / crop residues were used for composting with earthworms. Farm waste was managed and converted into useful/ enriched bio fertilizers.
- Participation in training programmes of agriculture department helped in knowing useful practices high yielding varieties of seeds, eco-friendly avocations etc.

4. Results Achieved

The results achieved by ShriRamadasKannyaGowdaafter availing the facilities from agriculture department and other departments of Government.

4.1 Increased productivity and income

Pre BhoochetanaIncome :Rs 19000/ acre, Net Income : Rs 19000- Rs 15000= 4000
Post Income :Bhoochetana : Rs 34840/ acre, Net Income : Rs 34840-Rs 14800= Rs 20040

There has been increase in income of Rs 16040 from one acre of land over a period of

5-6 months. The application of inputs have improved soil health and then increased recharge to ground water.

4.2 Reduction in cost of cultivation

Cost of cultivation was marginally reduced i.e. Rs 200. But the Bhoochetana practices have left a good amount of positive impact on the soils.

4.3 Diversification

Farmers' income increased and hence surplus was invested in dairying and off farm activities.

4.4 Improvement in awareness levels

Sri RamadasKannyaGowda now knows from where the seeds of high yielding varieties of seeds and other inputs are available. His knowledge and skills improved due to continued trainings and capacity building exercises imparted by the department of agriculture during Bhoochetana period.

4.5 New initiatives

As he has additional income started dairying and off farm activities which give him additional very high incomes.

4.6 Improved standard of living

His additional income enabled him to keep his children in hostels for higher education .At home his nutritional value of food improved as he could consume adequate quantities of milk. Off farm activities allowed him spend comfortably and lead life of improved standards.

4.7 Ecofriendly Practices

Bhoochetana program propagates eco-friendly practices through improvement in soil health from organic inputs like composts, bio fertilisers, bio pesticides, neem by products, FYM, lime etc.

5. Sustainability

Application of inputs like gypsum/ lime has modified soil structures , organics have improved the soil physical, chemical, biological and microbiological properties appreciably. This tends to improve moisture holding capacity of soil. Water availability over crop growing period increased. Micro climate around crop plant

roots modified and hence locally moist humid zone created will support plant growth for a longer period. Moist soil accentuated ion exchange capacity resulting in nutrient availability over a longer period of time . Moisture accentuates activities soil decomposers and hence residual soil nutrients will be released to plant available form / pool. All these positive changes enable soils to produce more and more crops on a sustainable. Hence, without any doubt Bhoochetana programme is sustainable over a period of time a long time to come .

6. Lessons Learnt

Now RamadasKannyaGowda is aware of the places from where inputs could be procured. Critical inputs like seeds micronutrients etc. are procured without losing much of his time. Improved seeds with critical inputs improve crop yield Gypsum / lime improves soil physical conditions which in turn improves the moisture capacity. Soil health is a critical factor for farmer and so also to nation.

7. Replicability

As explained in sustainability column, Bhoochetana programme is highly sustainable over a good period of time. The beneficial impacts / results are highly replicable. Aggraded soils are ready to host the cultivation of crops on a continuous basis with systematic crop rotations/ crop mixture / mixed farming. The programme therefore is highly replicable.

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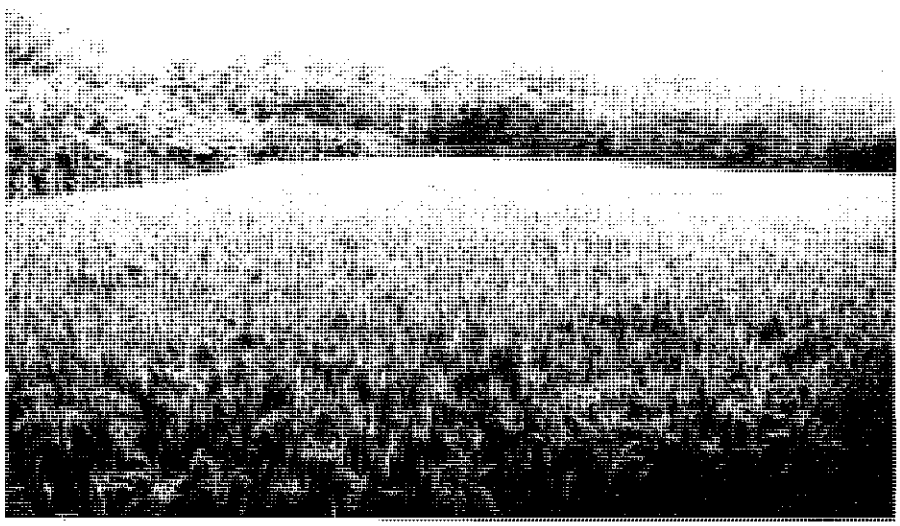



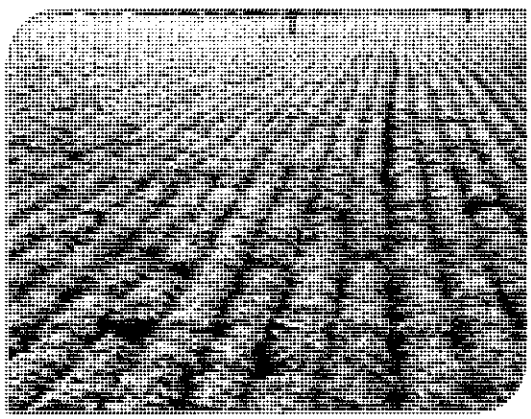
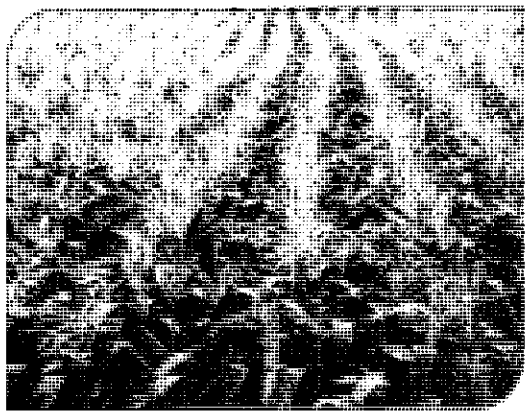

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