

Evaluation of Bhoochetana Programme (2009-10 to 2011-12)

Department of Agriculture

Executive Summary and Conclusions

Introduction

‘Bhoochetana’ means “reviving the soils”. The programme is intended to cover selected target group of small/marginal farmers who depend on agriculture & allied activities as their sole earning proposition. The overall goal of Bhoochetana programme is to increase average productivity of selected crops by 20 % in four years.

The mission mode programme is being implemented by the Dept. of Agriculture in association with Watershed Development Department, Universities of Agricultural Sciences (Bangalore, Raichur and Dharwad) and International Crops Research Institute for the Semi – Arid Tropics (ICRISAT) and community based organizations such as Raitha Samparka Kendras (RSKs) as Consortium partners.

As the project has been implemented for four years, viz. from 2009-10 to 2012-13, it was decided to have the project evaluated by a third party as per the requirements of GoK / GoI and in the bidding process, NABCONS was awarded the contract for conducting the evaluation study. This report presents the findings of the evaluation study by NABCONS.

Data collection and analysis

To meet the requirements of the terms of reference of the evaluation study, both secondary data and primary data were collected. All the data at aggregate level, whether the State or the district, on project implementation were collected for all the years of programme implementation i.e., from 2009-10, the first year to the year, 2012-13. The data from sample farmers were collected with 2011-12 as the reference year. Further, to assess the impact of the programme on production, the yield data of the crops grown by the farmers just one year prior to their induction into the programme was collected and compared with the yields of the reference year. The total number of sample farmers contacted was 8466. The sample farmers were post stratified based on the crop grown, category of farmers viz., marginal, small and others and based on location with reference to watershed area. In all, there were 3169 marginal farmers, 3713 small farmers and the remaining being other farmers. Crop wise, 2415 farmers cultivated ragi during 2011-12, 2316 farmers maize, 1766 farmers red gram, 349 farmers groundnut, 1341 farmers paddy and 1147 farmers jowar. Less than 1000 farmers had cultivated other recommended crops. Farmers falling within watershed areas numbered 2451 (29%). Simple / weighted averages and frequency distribution analysis were used

for generating the results.

Physical achievements

The physical achievements were analysed with respect to the following components:

- District wise targeted acreage
- Crop wise targeted acreage
- Distribution of micronutrients
- Appointment of farmers facilitators
- Institution of farmers field schools

District wise achievement of area targets

On the aggregate at the State level, the achievement was satisfactory during both the Kharif (120%) and Rabi (100%) seasons for the year 2009-10. The achievement was also satisfactory at 94 % and 90 % respectively during Kharif and Rabi 2010-11. There was reduction in achievement levels during Kharif (89%) and Rabi (82%) seasons during 2011-12. The achievement further declined to 75% during Kharif 2012-13 and to 68% during the Rabi 2012-13. More than 100% achievement during the year 2009-10 may be attributed to limited number of districts and limited area in the first year which enabled the DoA to register good progress during the first year itself despite some teething problems. The larger shortfall in achievements in 2012-13 may be attributed to drought prevailing in different parts of the state. Nevertheless the declining percentage of achievements reflects a kind of fatigue in implementation as there was no commensurate additions to the human resources in the department for implementing the programme.

It was observed that during Kharif 2011-12, the overall achievement for the State as a whole was 89%. The targets were achieved in full in 7 districts viz. Bangalore rural, Bangalore Urban, Belgaum, Bellary, Dakshina Kannada, Kodagu and Udupi. The targets were not achieved in respect of 23 districts. There was very low achievement in some districts viz. Bijapur (59%), Mandya (69%), Kolar (81 %), Tumkur (81%), Raichur (82%), Chitradurga (84%) and Gulbarga (88%). The reason for very low coverage in these districts was chronic drought conditions.

During Rabi 2011-12, the achievement in area coverage was 86 % for the State as a whole. The highest achievement was recorded in Belgaum district (105%) followed by Bellary district (95%). The lowest achievement of 54% was recorded in Haveri district. The achievement was less than the State average in respect of three districts viz. Haveri (54%), Koppal (59%) and Davanagere (73%).

During Kharif 2012-13, the achievement for the State as a whole was 75%. There were two districts which achieved 100% namely Dakshina Kannada and Kodagu. The lowest achievement was recorded by Bangalore Urban District (39%) followed by Tumkur and Mandya districts (47%) each. There were 13 districts where the achievement was lower than the State average viz. Bagalkot, Belgaum, Bangalore Urban, Bijapur, Chamrajnagar, Chithraduraga, Dharwad, Gadag, Koppal, Mandya, Raichur and Tumkur.

During Rabi 2012-13, the overall achievement for the State as a whole was 68%. While the highest achievement was recorded by Yadgir (98%) followed by Bidar (95%), the lowest achievement was recorded by Chamrajnagar, Chitraduraga, Davanagere, Mandya, Mysore and Shimoga districts where the achievement was nil. The achievement was not satisfactory in respect of two districts viz Tumkur (30%) and Hassan (47%).

Crop wise achievement of targets

During Kharif 2011-12, the overall achievement was 89 %. The achievement was extremely satisfactory in respect of soybean (130%) followed by cotton (108%), maize (103%) and paddy (100%). The lowest performance was recorded by black gram (60%) followed by field beans (63%).

During Kharif 2012-13, the overall achievement was 75%. The highest achievement was recorded by Soy Bean (99%) followed by Maize (91%). The lowest achievement was recorded by sun flower (35%). The achievement was also very low in respect of Green gram (38%) and ground nut (47%).

The overall achievement during Rabi 2011-12 for the State as a whole was 86%. While there was more than 100% achievement in respect of Groundnut (104%), the lowest achievement was recorded by sunflower (61%) followed by safflower (64%) and Wheat (65%).

During Rabi 2012-13 season, the overall achievement for the State as a whole was 68%. There was more than 100 % achievement in respect of 2 crops viz. Groundnut (120%) followed by Sugarcane (100%). The lowest achievement was recorded by Safflower (31%) followed by Sunflower (41%) and Bengal Gram (59%).

Achievement under micronutrient distribution

Based on the projected area targets under different crops and the recommended dosage of micronutrients, the requirements of micronutrients in any season is arrived at 50% of the recommendations and the Department procures these inputs and supplies through the RSKs. Data presented in the annual reports of the programme, revealed that there is deficiency in the supply of individual micronutrients as compared to the requirements as could be seen from the following facts:

- Only 15-34% of the requirement of gypsum was supplied during the kharif seasons of the years 2010-11 to 2012-13.
- While the supply percentage of Zinc was better in all the three kharif seasons ranging from 37% to 62% of the requirement, the same was mixed for Borax – 7% in Kharif 2010-11, 50% in Kharif 2011-12 and 27% in Kharif 2012-13.
- In general the Kharif 2011-12 supplies fared better than the other two kharif seasons in respect of all the three nutrients.
- The rabi season supplies in all the three years in respect of all the three micronutrients were substantially lower than the Kharif season supplies.

The overall Gypsum consumption per hectare was very low during the 4 year period commencing from 2009-10 to 2012-13. The highest consumption was recorded during Kharif 2011(37.90 Kg/ha) and the lowest consumption was recorded during Rabi 2012 (5.40 kg/ha) season. The recommended dosage was 200kg per ha. Similarly, in the case of Zinc sulphate, the highest consumption of 3.46 Kg/ha was recorded during 2011 and the lowest consumption was recorded during Rabi 2012 (0.58 kg/ha) season. The recommended dosage for zinc sulphate was 13-25 kg per ha. Highest consumption of borax was also recorded during Kharif 2011 and the lowest consumption was recorded during Kharif 2009 season and Rabi 2012 season. The recommended dosage for borax was 5 kg per ha.

Achievements under other activities

Appointment of Farmer Facilitators (FFs) and establishment of Farmer Field Schools (FFS) are the other two major activities for which physical targets were fixed under the programme. They were achieved in full.

Fund allocation to Bhoochetana

The funds required for Bhoochetana were sourced primarily from Central Sector Schemes (CSS) like RKVY, SEP, ISOPOM, NFSM, etc. It is a positive feature that the allocation for Bhoochetana programme has been progressively increasing over the years commensurate with the increasing physical targets. The allocation has increased from Rs. 1290.86 lakh during 2009-10 to Rs. 10700.72 lakh during the year 2012-13. The overall achievement in utilization of funds varied from 95.4 % in 2010-11 to 98.9 % in 2012-13.

The financial allocations were made for the following broad category of activities keeping in view the physical targets and per unit scale of finance to be made at the following rates for different activities:

- Input subsidy
- Honorarium for para extension workers
- Training to farmers including FFS
- Publicity through wall paintings / papers
- Rental for input storage
- Consultancy fee to ICRISAT

It was observed that while the overall financial targets were achieved, the progress was not uniform under each component and there were large scale variations. The rental for input storage has been underutilized in all the years. For example during the year 2012 –13, there was under-utilization of budget under Farmers Field School to the extent of 47.5 % and over utilization of funds under input subsidy to the extent of 274.9%.

On a per hectare basis, in the first year, the allocation was Rs 392 per ha while it stabilized around Rs 178 per ha during 2011-12 and 2012-13. The above funds were available for all activities envisaged under Bhoochetana. Besides, farmers were entitled to get 50% subsidy for seeds obtained from the RSKs under different state schemes.

Convergence of schemes

Over a period of time, the Department of Agriculture was implementing as many as 19 schemes for increasing agricultural production in the State. All these schemes were converged to channel the assistance under one umbrella i.e., Bhoochetana, a mission mode programme to benefit farmers in all the 30 districts of the state. Although, under Bhoochetana programme, various schemes which were in operation in the Department of Agriculture since many years were merged, these schemes continue to be operated as individual schemes for the purpose of extension of subsidy and other services at the field level. At State level, budgetary allocation for these schemes are made individually and later on merged under Bhoochetana programme.

The funds allocated to the individual activities are found to be adequate for the targeted programme. Therefore the existing sources of funds may continue to be utilized.

Processes followed at field level

The main activities undertaken under Bhoochetana are farmers registration, soil testing, trainings, awareness programmes, wall writings depicting soil fertility status and crop specific best management practices, Farmer Field Schools, selection of Farmer Facilitators (FF) and Lead Farmers (LF), hiring of godowns at cluster village for stocking of inputs and transportation of inputs from Raitha Samparka Kendras (RSKs) to cluster village, distribution of inputs at 50% subsidy, seed treatment and major crops selection. These activities were carried out in all the villages where the project was implemented. Based on the feedback received from the farmers, it can be concluded that the methods followed and practices adopted in popularizing the use of micro nutrients by farmers and other improved package of practices were found to be appropriate.

Processes followed at operational level

Apart from the above, the processes adopted by the DoA at the operational level were also found to be effective in obtaining the desired results. The following processes are followed at the operational level:

- I. Three tier System of Monitoring and coordination adopted by constituting taluk, district and State Level Coordination Committees (SLCC). The programme is being implemented in a Mission mode and coordination at different levels starting with cluster of villages in each Taluk, linking-up with Taluk level coordination committees (TCCs). TCCs are linked –up with

district level coordination committees (DCCs) and state level co-ordination committee (SLCC)

- II. Soil nutrient based recommendations was a key feature of the programme
 - III. Organizing Field Days and Field Visits by the DoA
 - IV. Weekly review meeting with input suppliers during Kharif season
 - V. Funds convergence: The funds for Bhoochetana were converged from all schemes of both central and state sectors like Integrated Scheme of Oilseeds, Pulses, Oil palm and Maize Development (ISOPOM), National Food Security Mission (NFSM), Accelerated Pulse Production Program (APPP), National Project on Management of Soil Health and Fertility (NPMSF), RKVY and State Sector schemes like Enrichment of Soil Fertility.
- Monthly program implementation calendar (MPIC) guidelines were
- VI developed for better monitoring of the program
 - VII. Review meetings were conducted regularly. Nodal officers meetings on Tuesday and video conferences on Wednesday were organised on a weekly basis. In these review meetings, other departmental programs were also reviewed.

Awareness about the programme

The most popular medium of awareness about the programme was the extension worker viz., the farmer facilitator, with a response rate of 90 % of the sample respondents. The other popular modes were wall writings (75%), posters (48%), hand outs and brochures (44%). The least popular mode was the TV (18%) and radio (9%) and the newspapers (23.5%). A view needs to be taken as regards the use of electronic media for popularising the programme keeping in view the budget required for the same.

Availability of nutrients

More than 90% of the farmers responded positively about the availability of seeds and micronutrients on time, in required quantity, quality and at subsidised rates. As regards bio fertilisers and bio pesticides, about 75% of the respondents responded positively.

Provision of soil health cards.

About 65% of the sample farmers have been provided with soil health cards with the percentage being the same across the different category of farmers.

Effectiveness of transfer of Technology through Farmer Facilitators at the Village Level

The concept of farm facilitators (FF) has been an excellent tool to bridge the yawning gap between farmer on one hand and the Department of Agriculture on the other. Farmer Facilitators are selected from among the practicing farmers themselves. Each FF is allocated an area of 500 ha, usually in and around his farmland (village). As of now 10000 farm facilitators have been enrolled for agriculture extension exclusively for Bhoochetana programme. Apart from disseminating information on Water conservation methods like collection and storage of water in the farm ponds, use of micronutrients, use of high yielding varieties/ Hybrid seeds, inter culturing, bund formation, seeds treatments with biofertilizers, seed treatment and shade drying to control seed borne diseases , use of seed drum for seed treatment summer ploughing, IPM and INM, crop rotation, etc., they were involved in capacity building of farmers through FFS, associated with crop cutting experiments, linking RSKs with farmers, ensuring input supply to farmers etc. In short, they have become very effective substitutes to regular extension workers in the Department of Agriculture.

Farmer facilitators hold the key to creating awareness about the programme. They undertake visits to farmer's fields during the crop season; about 60% of the respondents indicated that FFs visit their farms on a weekly basis with about 10% to 13 % each reporting daily, fortnightly and monthly visits. About 2% of the farmers also informed that the FFs never visited them. Nevertheless, the fact remains that the FFs being local farmers of the area could guide the farmers at higher frequencies than what the official extension agencies can do with their limited man power. More than 80% of the farmers indicated that FFs provided useful information about new crop varieties, seed treatment practices, plant protection measures apart from calendar of operations (77%), and use of machinery (68%). In short, FFs are 'backbone of agriculture department' as they form 'organic link' between the Department of Agriculture and farmers. Their services have been highly useful as compared to former Gram Sevaks. Actually, 'FFs are barefoot farm doctors' and they could be termed as 'extended arms of the Agriculture Department'.

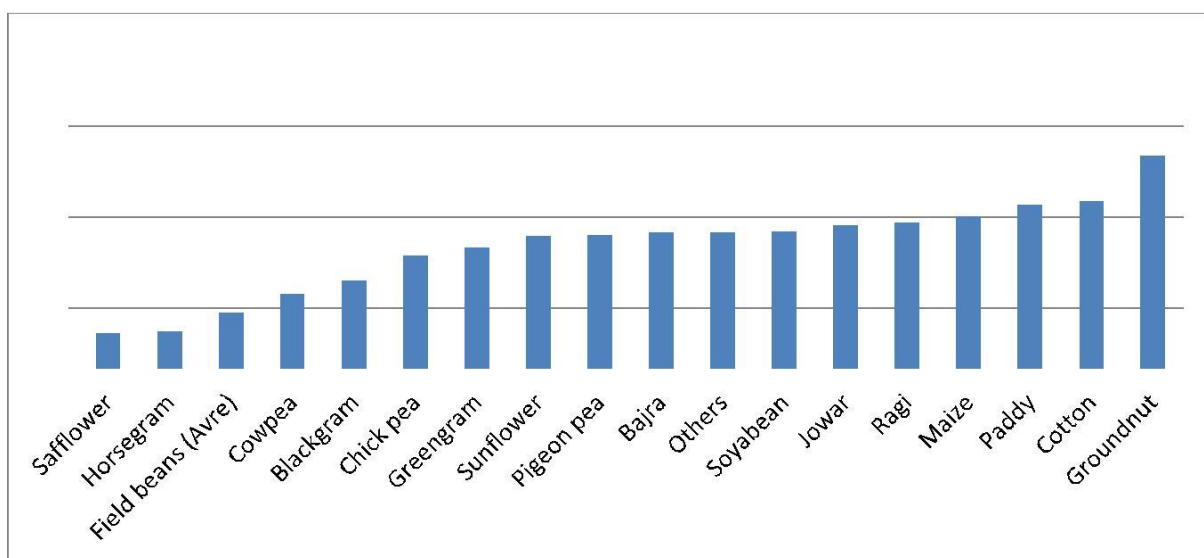
Adoption of technology

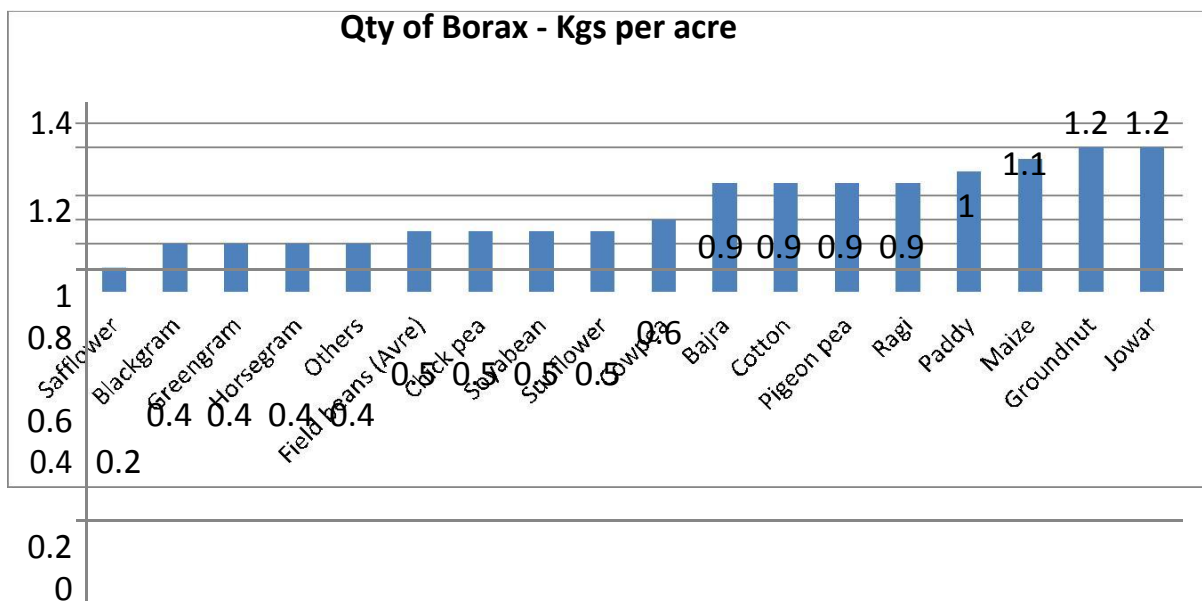
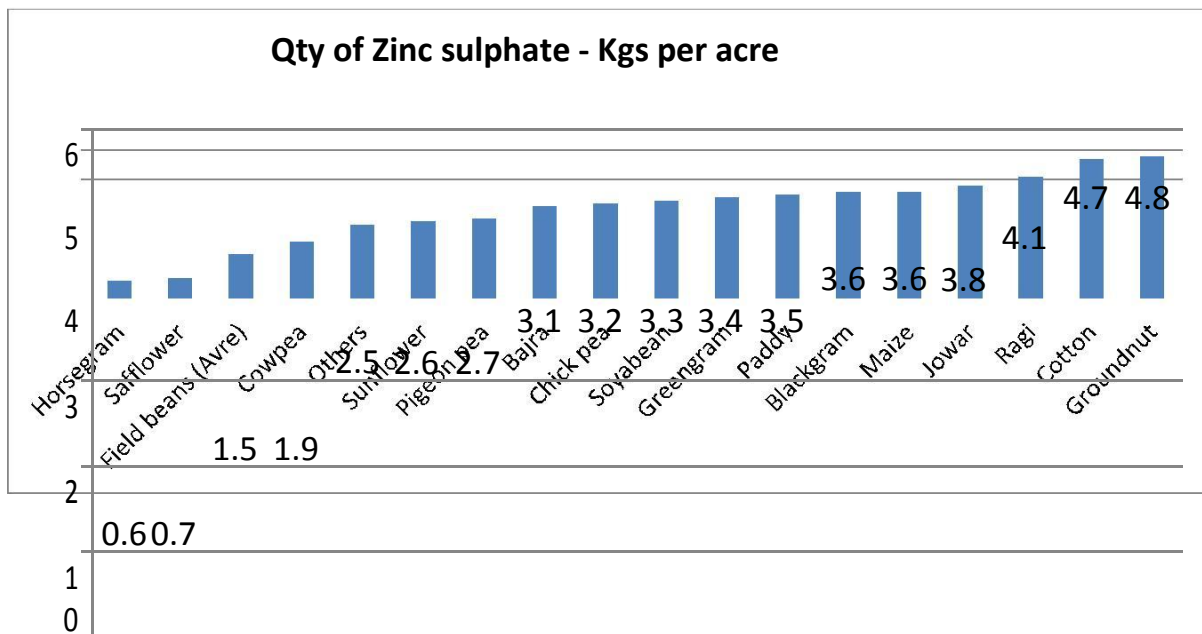
The essence of Bhoochetana is to disseminate information on adoption of improved variety of seeds, seed treatment, integrated nutrient management, integrated pest management and soil and water conservation practices so as to lead to an increase in the productivity levels. The sample farmers were interviewed on the above parameters. It was observed that a large majority of sample farmers had

adopted the recommended variety of seeds. The adoption levels of other practices varied.

It can be observed that more than 90% of the farmers had applied gypsum and micronutrients at least for one crop indicating a very high positive perception of the farmers on the benefits of the use of micronutrients. It may be noted that the sample farmers for the study were selected randomly from a list of farmers who had availed at least one micronutrient / gypsum from the RSK. Therefore the percentage of farmers adopting micronutrients is more than 90 %. However the average quantity applied was lower than the recommended quantity (80 kg / acre for gypsum, 5-10 kg of Zinc and 1 kg of Borax per acre) as the supply was lower than the requirement. The average quantity per acre applied by the sample farmers for individual crops is given in charts below:

Qty of Gypsum - Kgs per acre





While the use of farm yard manure was very high with 89% of the farmers adopting the same, the proportion of farmers using other forms of organic manure was lower, between 19 and 37%. Nitrogen based fertilizers have been used by about three-fourths of the farmers while use of MoP and complex fertilisers was less than 50%. It is also significant to note that 86% of the farmers have adopted seed treatment while 72% have used rhizobium. In all, the efforts of the extension agencies have resulted in adoption of many of the recommendations of integrated nutrient management, while some grey areas remain.

It could be seen that while only one percent of the farmers have adopted all the INM practices, about 46% have adopted 9 and above practices. Non availability of some inputs and lack of interest in certain techniques are reported to be the reasons for non adoption of some of the recommendations.

The adoption percentage of IPM practices by farmers was lower than the INM practices. Further promotional efforts are required to popularize the practices. About 53% of farmers reported adoption of recommended dosage of pesticides while 32% reported conservation of beneficial insects and 17%, use of bio agents. Additional promotional efforts are required to popularize the practices.

Construction of rain water harvesting structures and practicing in situ moisture conservation techniques are the two practices advocated for rain fed farming areas. As per filed survey, rain water harvesting structures have been constructed only by 21.8 % of the sample farmers with a larger percentage of other farmers constructed such structures.

Extension participation by the farmers

Participation in demonstrations, agricultural tours, field days, group discussions, agricultural exhibitions, Krishi Melas and farmers' field schools are the areas of extension participation of the farmers. About 65 to 70% of the farmers expressed that they had participated in demonstrations, field days, group discussions, agricultural exhibitions, Krishi Melas and farmers' field schools. Participation in Agricultural tours was lower at 45%.

Inputs storage and village seed banks

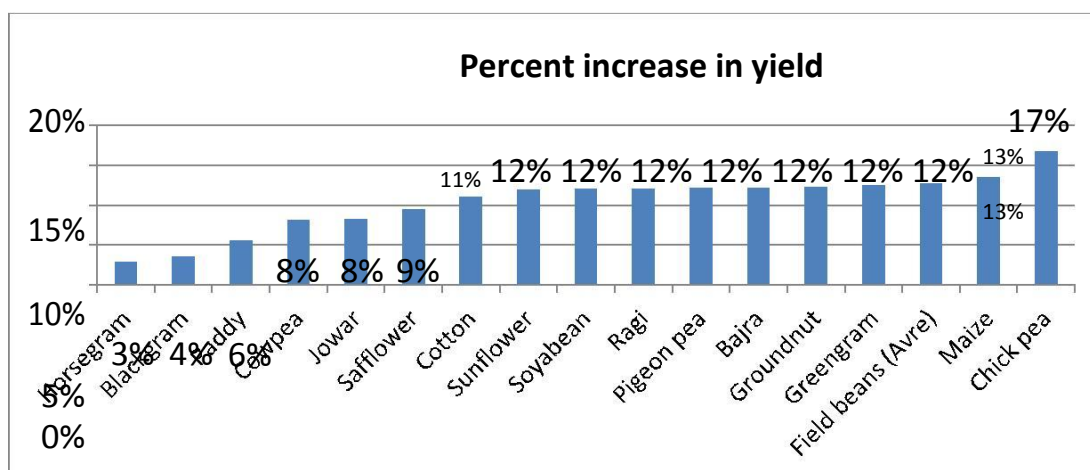
One of the important components of the programme is to have storage facilities for inputs at village / cluster village level so that the inputs are made available to the farmers nearer to their farms. A specific budget has been earmarked for this purpose in the financial programme. The opinion survey of farmers revealed that the inputs stores are available in 25% of the sample villages. The distance of the store from the village in other cases ranged from a minimum of 2 km to even more than 30 km.

The average distance to be travelled to purchase the inputs is about 9.78 km. About 25% of the farmers revealed that that they had to travel more than 20 km to purchase the inputs. There is a need to ensure availability of inputs at cluster villages. Village seed banks are another concept mooted under the Bhoochetana programme so that good quality seeds are made available to the farmers at the village itself. This concept has also not gathered momentum as

it was found that about 95% of the farmers feigned ignorance of the seed bank concept.

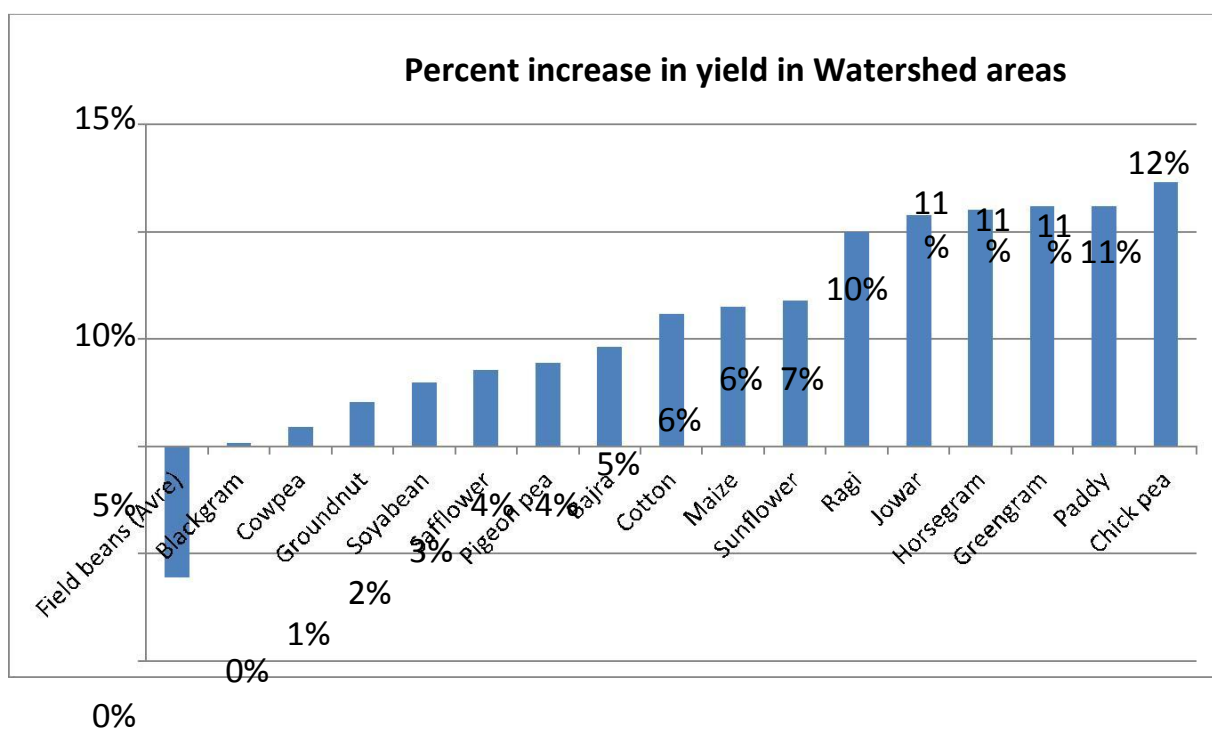
Impact of the programme on crop yields

At the start of the programme, it was envisaged that after four years of implementation, the productivity of the crops would increase by 20%. The reference year for the study was 2011-12. The productivity increases estimated through the sample survey in respect of different crops varied from a minimum of 2.93% in case of horse gram to 16.79 % in respect of chick pea. The chart below depicts the range in increase in productivity.



Impact of watershed activities on crop yields

The yield levels obtained by the farmers in the areas treated under watershed approach in the State looks to be better than the areas not treated during 2011-12. The crop wise increase in productivity estimated through sample survey of farmers within watershed area and outside watershed area is presented in Chart below.



-6%
-
10%

The incremental yields obtained in watershed areas vis-à-vis non - watershed areas was subdued in respect of several crops mainly due to the fact that many farmers in non-watershed areas also had adopted soil and water conservation measures as part of Bhoochetana programme and therefore the difference in yields between watershed treated areas and non-watershed treated areas was not more pronounced

Impact on Income

The net income per acre realised by the farmers in respect of food crops ranged from a low of Rs.2394/acre in case of ragi, jowar (Rs.2622/acre), bajra (Rs.2566/acre), and paddy (Rs.4788/acre).

In case of pulses the net income varied from a low of Rs.702/acre in respect of horse gram to a high of Rs.7076/acre for pigeon pea.

In respect of oil seeds the net income varied from Rs.3384/acre in case of safflower to a high of Rs.19550/acre in case of soybean.

In respect of maize the net income per acre was Rs.10130 and it was Rs.18057/acre in respect of cotton.

Category wise the net income in respect of marginal farmers was Rs.2504/acre, Rs.1954/acre for small farmers and Rs.2734/acre for other farmers for ragi.

For jowar net income varied from a low of Rs.786/acre in case of marginal farmers to a high of Rs.1765/acre for small farmers.

For bajra net income was varied from a low Rs.1203/acre to a high of other farmers to a high of Rs.2138/acre for marginal farmers.

In respect of paddy the net income varied from a low of Rs.3408/acre for marginal farmers to a high of Rs.5718/acre in respect of other farmers.

In respect of pulses, the net income varied from Rs.1044/acre for horse gram to high of Rs.9433/acre in case of black gram in respect of marginal farmers.

For small farmers, the net income varied a low of Rs.360/acre in case of horse gram to a high of Rs.7128/acre in case of pigeon pea.

For other farmers the net income varied from a low of Rs.131/acre in case of cow pea to a high of Rs.6360/acre in case of chick pea.

In case of oil seeds the net income varied from a low of Rs.4543/acre in case of safflower to a high of Rs.19692/acre for soy bean in respect of marginal farmers.

For small farmers the net income varied from a low of Rs.3554/acre in case of safflower to a high of Rs.19692/acre for soybean.

For other farmers the net income varied from a low of Rs.3180/acre for

safflower to a high of Rs.19406/acre in case of soy bean.

In case of cotton the net income varied from a low of Rs.13119/acre for marginal famers to a high of Rs.20268/acre for small farmers.

In respect of maize the net income varied from a low of Rs.8821/acre in respect of marginal farmers to a high of Rs.10823/acre for small farmers.

Appropriateness of crop cutting experiments

Under the Bhoochetana programme, the Department of Agriculture in consultation with ICRISAT and University has adopted a uniform crop sampling procedure across all districts for cutting crop samples to estimate yields. As per discussions with the ICRISAT and Department of Agriculture officials, it is observed that a total of 10 farmers / crop / taluk are selected for crop cutting experiments. These farmers are purposively selected in the sense that they have adopted the recommended package of practices and their fields act as demonstration plots for field schools of the farmers. A comparison of crop cutting experiments carried out under Bhoochetana with the procedure followed by DES revealed that the major difference in methodology relates to selection of sample farmers. The Bhoochetana sample is purposively selected based on level of adoption. To that extent the yield data would have an upward bias as these farmers are leaders and their adoption levels would be high. This type of approach to yield estimation is quite good when one has to estimate the impact of improved technology on crop yields. However, this would throw an upward bias if these sample yields are utilized to arrive at a macro picture of production as there may be a large of farmers who practice sub optimal adoption levels for various reasons. One can conclude that the methodology especially selecting the sample farmers for crop cutting experiments under Bhoochetana is appropriate for the limited purpose of demonstrating the yield potentials of different interventions.

Further there are 176 taluks in the state and at the rate of 10 farmers per taluk and three samples per farmer, the total samples collected for CCE under Bhoochetana would be 5280 per year; in comparison under the regular DES scheme of crop cutting experiments, a total of about 94000 samples are planned to be collected with Kharif season samples alone amounting to 58400. By design the CCE under Bhoochetana, has limited applicability for macro estimates.

Extension reforms

By and large, extension reforms were top on agenda for implementation of the Bhoochetana programme. Bottom up planning starting with Hobli level, decentralized and flexible implementation system, appointment of farmers facilitators, intensification of training to farmers, adoption of various extension methods like demonstrations, agricultural tours and exhibitions etc., had yielded good results in transferring technology to the farmers. Farmers

Field Schools were found to be another useful method but its effectiveness seems to be diluted in view of the stipulation of having one school per hobli irrespective of the number of farmers covered. The following four areas of extension reforms are yet to receive adequate attention:

- Group approach to extension
- Involvement of multiple agencies including private companies in extension efforts
- Absence of integrated farming systems approach
- Self sustainability of the extension programme as most farmers are unwilling to pay for extension services

Role of different institutions

All the consortium partners have discharged their responsibilities as laid down in the guidelines. However, based on field level feedback, it is felt that certain areas may need focused attention for achieving better results on the objectives of the programme. They are enumerated as under:

Inadequate staff in the Department of Agriculture, the nodal implementing Department would hamper the effective implementation of the programme; in fact there is absence of dedicated staff in the department to exclusively attend to Bhoochetana programme. All staff looks after all the programmes of the Department of Agriculture. Besides, it was learnt that there has been no staff augmentation in the department to implement the programme. A grass root level institutional vacuum in the medium term would affect the programme adversely; the farm facilitators are filling the vacuum but there is a need to institutionalize the farmers' facilitators to make them fully responsible and accountable. Staff augmentation at RSK level is crucial as the RSKs are to function as single extension point at Hobli level for departments of Agriculture, Horticulture, Watershed Development Department, Animal Husbandry & Veterinary Services, Sericulture, Fisheries, Agriculture Marketing, Social Forestry and other agri related departments. Currently one officer mans most of the RSKs and sometimes one officer manages more than one RSK.

Raitha Samparka Kendra (RSKs) comes into direct contact with the farmers. At present RSKs are having lot of problems viz. lack of proper buildings, storage facilities, office equipments and lack of staff. Hence, RSKs are required to be strengthened and better equipped to serve the farmers and to get the desired results.

Watershed development programmes to be fully integrated with Bhoochetana programme as the results clearly show a direct positive correlation with yields; yet only 2451 i.e. (29%) of sample farmers fall under watershed development areas. Discussions with the WDD revealed that the list of watersheds in which the department is implementing the IWMP is handed over to the Agriculture department for convergence of activities. No funds of WDD are earmarked for Bhoochetana programme. However, Bhoochetana being a programme to cover all the areas and all taluks, it is inevitable that a large number of

beneficiaries fall outside watershed areas. In the circumstances, unless there is a conscious decision to focus Bhoochetana activities, the IWMP and Bhoochetana programmes may run as parallel programmes without any convergence.

The role of ICRISAT: The role of ICRISAT was most critical among all other institutions in implementing Bhoochetana programme. While ICRISAT has done yeoman services in providing guidance and hand holding support at State level and influencing the policies of the DoA, it was observed during the field study that the presence of ICRISAT was not much felt at RSKs level and field level. There was also demand from farmers that ICRISAT staff should interact more frequently with farmers. It was also felt that ICRISAT should also have more technical staff (Agriculture graduates) instead of general category staff having general degrees qualifications like B.A, BSc or MSW.

Suggestions to Improve Effectiveness in Implementation and Enhance Impact of the Scheme

The scheme implementation has looked in to only supply side of the scheme. Input distribution was planned based on soil tests and efforts were made to disseminate knowledge through trainings and Farmer Facilitators. But the scheme should look into the demand side and match their requirements.

By now, there is sufficient awareness among the farming community about the utility of the micronutrients. In order to make the implementation more effective, farmer friendly, environment friendly, State Government may proceed in consolidate the benefits and make the scheme self sustainable. To achieve the above mentioned goals, the following suggestions are made.

Full Coverage of Farmers: The department should call for an indent from all the farmers RSK wise and based on such consolidated quantities, supply should be arranged in a panchayat or cluster. Suitable system needs to be evolved for supply of inputs to all these farmers in time.

Supply of Fresh Stock: All the stocks proposed to be supplied in a season to the farmers should be from fresh stock. Technically speaking all these inputs have moisture content and these inputs needs to be used before moisture is lost. These inputs if supplied from old stocks, it loses its utility. It has happened in case of Gypsum and the farmers had expressed their dissatisfaction. Department may ensure that such incident will not recur in future.

Maintaining Proper Accounts: There should be a pucca system of maintaining accounts of sale proceeds with proper receipts issued to the farmers for actually purchasing the inputs guaranteeing thereby that needy farmers are actually benefitted and it also leads to inputs not finding place in the open market.

Reaching the unreachable: Attempts need to be made to take the inputs at the doorsteps of the farmers who are not been able to reach the RSK. Many sample farmers during the field visits were citing the example of fertilizers companies supplying their products at the village level and distributing them among the farming community.

Strengthening Information Dissemination System: The government needs to put in a place a better system of dissemination system, so that information reaches all the farming community. For example, introduction of Reuters Market Link (RML) that has been successful in

districts like Gulbarga, Bidar & Bijapur to be extended to all the districts in the state. The video conferencing system that is being used to update the information to the department personnel should also be used to find the extent of coverage of farmers who are sold/ distributed with the micronutrients instead of simply trying to know whether stocks are disposed off or not.

Simplification of Procedures of Purchase at Purchase centres offering MSP: Many farmers are shying away to sell their produce at purchase centres which involves additional cost due to cumbersome procedures and many farmers especially marginal farmers are disposing off their produce to agents / business people coming to their doorsteps at a un remunerative prices. Some steps could be taken by the government for

the purchase of the output at minimum support price (MSP) which encourages farmers to go in for micronutrients in exchange of their produce.

Grievance Cell at Government level: As of now, there seems to be no system of hearing the grievance of farmers at the Department / Government level. It is felt highly essential to have such a cell at the Commissioner's office at State level and Joint Director of Agriculture at district level. At least it will give an insight in to the nature and magnitude of problems being faced by the farmers.

Training: The training system so far though looks efficient in the process of disseminating information / knowledge, it is not working as desired. The farmers who are trained in Raitha Kshetra Pathashala are seen not spreading the techniques / processes / information down below as learnt during the field visits. Another system of giving information in ' Gram Sabhas' now being convened once a quarter is also having limited effect . Farmers having political interest or influential farmers attend such meetings and ordinary farmers are still away from such efforts. Efforts may be made to ensure the training benefit reaches all the farmers in the area.

Alumni of Trained farmers: Record of Farmers trained under Farmer Field Schools should be maintained and they should be entrusted with certain responsibilities along with ensuring timely supply of inputs to the farmers.

Seed Bank: Facility of setting up seed banks should be ensured in each village panchayat or cluster villages and leave it to be maintained by the farmers themselves so that they do not depend on Raitha Samparka Kendra in the long-run except for introduction of new varieties and to guide the farmers in improved agricultural practices.

Storage Facilities: Farmers are in need of storage facilities and godowns, the same needs to be set up for inputs as well as output. Farmers need to be protected from distress sale and MSP for their output should be ensured. Some urgent steps may be initiated to create such facilities. The Banks operating in the cluster villages may be roped in to financing rural godowns under Grammeen Bhandaran Yojana Subsidy scheme of Govt. of India.

Contingency plan: In addition to preparing an action plan, the department needs to put in place a contingency plan in the event of occurrence of natural calamities to ensure successful distribution of

seeds, micro nutrients and such other facilities to reach the target group in time.

Soil Testing Laboratories: Farmers were feeling deprived of getting their soils tested due to lack of soil testing laboratories at the Taluk level as it was observed during field visits that many farmers who had been covered for soil testing were yet to receive soil test reports even after a year. Further in Malnad areas, where pH of the soils is low, felt that they need to test the soils each year for supply of suitable quantities of lime for maintaining normal pH levels of the soil. Therefore, it is suggested that Soil Testing laboratories may be set up in each Taluk.

Functioning of RSKs: At present, the RSKs lack adequate staff in the state. In order to disseminate the new technologies to the farmers effectively, RSKs may be strengthened by posting technical staff.

Farmers clubs: There are large number of Farmers Clubs/Raitha Shakti Groups established by NABARD and the Govt in the state. Efforts may be made to utilize their services in popularizing the scheme and also to serve the farmers.

Farmers' producer organizations (FPOs): FPOs are proving to be a better platform for small and marginal farmers to pool their produce and negotiate for better price for their produce and also get inputs at cheaper rate when it is procured in bulk quantity. Therefore, it is suggested to promote more and more number of crop specific FPOs in the state.

Farm mechanization: In the recent years, there is acute shortage of labour in the field of Agriculture. Therefore, useful farm implements and equipments may be made available to the farmers on hire/ purchase basis through Agro-Service Centres/ACABC centres.

Training: More number of trainings on rain water harvest, soil and water conservation techniques may be given to the farmers.

IPM& INM: Dissemination of knowledge on adoption of IPM and INM technologies may be given importance for effective use of nutrients / pesticides.

Tank silt application: There are more than 37000 irrigation/village tanks in the state covering a command area of 160267 ha. In such areas, farmers may be encouraged to apply tank silt to their fields as the tank silt is highly fertile. It serves two purposes viz, deepens the tank and hence restores tank capacity to its original, provides farmers fields with highly nutritive soil/ fertility. The Agriculture Department may therefore, encourage the application of tank silt as a group activity through Raitha Shakti Group (RSG) Farmers Club (FCs) Village watershed committees (VWC).

Karnataka with 19 million hectares of area and a population of 61.1 million is the 8th largest State in terms of geographical area and 9th most populous State in the country. With State GDP of Rs. 3.12 lakh crore (at constant 2004-05 prices) during the year 2013-14, economically it is one of the leading States in India. As against the annual growth rate of GDP at 3.8 % in Agriculture at all India level (2004-05 and 2013-14), the annual growth rate of GDP in Agriculture was 3.3 % in Karnataka. Further, during the same period agriculture sector's average

contribution to the State GDP was at 15.50% vis-a-vis the all India average of 15.76 %. Two-third of the geographical area of the State falls under arid and semi-arid regions. Eighteen out of the total 30 districts are drought-prone and farmers in such districts have been facing repeated drought like condition. During the period between 2000 and 2008, the growth rate in agriculture in Karnataka was very low and was hovering between 0.5 % and 2 % which was a major concern for the State Government.

Genesis of Bhoochetana

In the above backdrop, Government of Karnataka formulated 'Bhoochetana' programme on a mission mode for implementation in all the 30 districts over a period of four years from 2009-10 to 2012-13. The programme was formally launched by the Hon'ble Chief Minister in Haveri district on 23 May 2009. The goal of the programme was to bring in a positive change in the lives of farmers by increasing crop productivity of select crops by 20 % in four years. The programme was intended to cover select target group of small/marginal farmers who depended on agriculture & allied activities. The total area to be covered under the programme was 50 lakh hectares during the project period of four years.

Consortium Partners

The programme was implemented by the Department of Agriculture in association with Watershed Development Department, Universities of Agricultural Sciences (Bangalore, Raichur and Dharwad), Raitha Samparka Kendras (RSKs), and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

Evaluation of Bhoochetana Programme

After implementation of the programme, Government of Karnataka decided to evaluate the project by a third party and NABARD Consultancy Services (NABCONS) was awarded the contract for evaluating the programme.

Objectives of the study

The major objectives of the study were to assess the overall impact of the Bhoochetana programme in different areas like effectiveness of extension through farmer facilitators, knowledge enhancement of the farmers, impact on socio-economic status of the farmers, yield enhancement etc. and to identify the lapses in implementation and to make suitable recommendations for improving the impact of the scheme.

Sample framework of the study

The study was conducted in all the districts during the period between April 2013 and March 2014. As against the indicated sample size of 8,270 by the Dept. of Agriculture, 8466 samples were covered under the study. In all, there were 3,169 (37%) marginal farmers, 3,713 (44%) small farmers and 1,584 (19%) other farmers. Crop-wise, 2,415 farmers cultivated ragi, 2,316 farmers maize, 1,766 farmers red gram, 349 farmers groundnut, 1,341 farmers paddy and 1,147 farmers jowar. Further, about 1000 farmers were found cultivating crops other than the recommended crops. Farmers falling within watershed areas numbered 2,451 (29%). The reference year for the study was 2011-12.

Major findings of the study

1. Achievement in terms of Transfer of Technology, distribution of inputs etc.

- The use of modern machineries such as tractors, power tillers, harvesters,

sprayers and dusters has increased over the years in farm operations. In the absence of adequate bullocks and buffaloes for agricultural operations these machineries were used for undertaking land preparation, land levelling, sowing, transplanting, weeding, spraying and harvesting activities.

- A large majority of sample farmers had used the recommended variety of seeds. More than 90 % of the farmers had applied gypsum and micro nutrients at least for one crop, indicating a very high positive perception of the farmers on the benefits of the use of micronutrients. While one per cent of the farmers had adopted all the INM practices about 46% had adopted more than nine INM practices. The major reason for non-adoption of some of the recommendations were non availability of select inputs and lack of interest in certain techniques.
- Shortfall in the distribution of gypsum and micronutrients was observed. The shortfall was ranging from 38% to a maximum of 85% of the targets across the years. As a result the application of gypsum, zinc and borax was lower than the recommended dosages.
- The sample farmers for the study were selected randomly from a list of farmers who had availed at least one micronutrient / gypsum from the RSK. Therefore the percentage of farmers adopting micronutrients is more than 90 %. However, the average quantity applied was lower than the recommended quantity (80 kg / acre for gypsum, 5-10 kg of Zinc and 1 kg of Borax per acre) as the supply was lower than the requirement. About 86% of the farmers have adopted seed treatment while 72% have used rhizobium. In all, the efforts of the extension agencies have resulted in adoption of many of the recommendations of integrated nutrient management, while some grey areas remain.
- The selection of farmers under crop cutting experiment under the programme was as per the methodology devised for the same. However, as

most of the plots selected for the experiment are the demonstration plots owned by leaders/ progressive farmers the overall yield estimates based on these plots would throw an upward bias. Therefore by design it has limited applicability for macro estimates.

- Over a period of time, the Department of Agriculture was implementing as many as 19 schemes for increasing agricultural production in the State. All these schemes were converged to channel the assistance under this programme. Although, under Bhoochetana programme, various schemes which were in operation in the Department of Agriculture since many years were merged, these schemes continue to be operated as individual schemes for the purpose of extension of subsidy and other services at the field level. At State level, budgetary allocation for these schemes were made individually and later on the budget was merged under this programme. The funds allocated to the individual activities were found to be adequate for the targeted programme.
- The role played by 'Farm Facilitators' was found to be an excellent tool to bridge the gap between the farmer on one hand and the department of Agriculture on the other.

2. Physical and Financial achievements and the processes followed

- The overall achievement of coverage was 2009-10: Kharif season (120%) and Rabi season (100%), 2010-11: Kharif season (94%) and Rabi season (90%), 2011-12: Kharif season (89%) and Rabi season (82%) and 2012-13: Kharif season (75%) and Rabi season (68%).
- The allocation of fund for the 1st year was Rs. 392 per ha and it hovered around Rs. 178 per ha during 2011-12 and 2012-13. The amount spent on input subsidy/ha was Rs. 58 and Rs. 85 during 2011-12 and 2012-13 respectively.
- The main activities undertaken under Bhoochetana were farmers'

registration, soil testing, trainings, awareness programmes, wall writings depicting soil fertility status and crop specific best management practices, Farmer Field Schools, selection of Farmer Facilitators (FF) and Lead Farmers (LF), hiring of godowns at cluster village for stocking of inputs and transportation of inputs from Raitha Samparka Kendras (RSKs) to cluster village, distribution of inputs at 50% subsidy, seed treatment and major crops selection. These activities were carried out in all the villages where the project was implemented. The methods followed and practices adopted in popularizing the use of micro nutrients by farmers and other improved package of practices were found to be appropriate. Further, the processes adopted by the DoA at the operational level were also found to be effective in obtaining the desired results.

3. Impact of the programme

- By the year ending 2012-13, 40.52 lakh farmers, constituting 92.3% of the total 44 lakh farmers registered under the programme were benefitted.

- The crop yield increase during post Bhoochetana as compared to pre Bhoochetana was more than 10% in respect of all the major crops such as chickpea, maize, field beans, green gram, ground nut, bajra, pigeon pea, ragi, soy bean, sunflower and cotton. However, the minor crops like horse gram, safflower and black gram recorded less than 10% increase in yield levels. The lowest increase was recorded by horse gram (2.93%) and the highest increase by chick pea (16.79%). However, the crop yield was comparatively lower than the very objective of the programme, where the yield was expected to be more than 20%.

- The programme in watershed areas had resulted in an increase in the productivity of different crops as compared to non-watershed areas. Soil and Water conservation activity is also one of the key components of the programme and many farmers in the non-watershed areas have adopted such measures though may not be in systematic manner.
- The farmers in general have got the maximum benefit from the programme and their knowledge, skill and understanding of crop husbandry increased. They have started diversifying their cropping pattern based on market demand and supply. They are now in a position to make a right crop–input mix for increasing their crop yield and income.

4. Identification of the lapses in scheme implementation and recommendations

(i) Lapses

- The major reason for non-adoption of some of the recommendations were non availability of select inputs and lack of interest in certain techniques.
- It was observed that there was a shortfall in the distribution of Gypsum and other micro nutrients which ranged from 38% of the target to a maximum of 85% of the target across the years and nutrients.
- There was an observed shortfall in gypsum and micronutrient distribution with the shortfall ranging from minimum of 38% of the targets to a maximum of 85% across the years and the nutrients.
- Although ‘Farmers’ Field Schools’ were found to be a useful tool for effective translation in increasing crop yields, the stipulation of having one school per hobli, irrespective of the number of farmers covered, was one of the constraints limiting the effectiveness of the programme.
- On extension reforms, integrated farming system approach, involvement of multiple agencies in it and a group approach have not yet received required attention.

- Village Seed Bank is another concept mooted under the Bhoochetana programme and this concept has not gathered momentum as it was found that about 95% of the farmers were ignorant about the Seed Banks.

(ii) Recommendations

- The input supply has to be augmented through larger procurement programmes and has to be effectively distributed through cluster godowns in the villages.
- In order to avoid short supply of inputs both seeds and micro nutrients, village / cluster-wise indents as per the requirements of farmers may be obtained well in advance and procurement may be done accordingly.
- Institutionalize 'Farm Facilitators' to make them accountable for the responsibilities entrusted to them.
- The technical staff at the RSK level need to be augmented as the RSKs have been identified as one-stop input supply unit at the hobli level for implementing the programme. Further their infrastructure in terms of buildings, storage facilities, office equipment etc., has to be scaled up for effective delivery of different services, as envisaged from them.
- Infrastructure for setting up seed banks should be created in each village panchayat or cluster villages and it should be left for maintenance by the farmers themselves so that they do not depend on Raitha Samparka Kendra in the long-run except for introduction of new varieties and to guide the farmers in improved agricultural practices.
- The FPOs are found to be an excellent tool for improving the standard of living of the small and marginal farmers, therefore, more and more number

of crop specific FPOs may be formed in the State. This would not only help in farmer to farmer extension but also increase their bargaining power while marketing their produce.