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Human Capacity Development to Adopt Best Practices

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4.1 Introduction

The concept of capacity development, which emerged during the 1980s, gained prominence in the 1990s and currently has wide usage in community development (Eade, 1997; UNDP, 1998; Bolger, 2000). The term capacity development is usually discussed as an approach to development and cooperation. Capacity development encompasses human resource development as an essential part of development (FAO, 1998). It is a process by which individuals, groups, organizations and societies enhance their abilities to identify and meet development challenges in a sustainable manner (UNDP, 1998). It is human resource development, which is a process of equipping individuals with the understanding of access to information, knowledge, training and skills that enables them to perform effectively. There is a direct relationship between capacity building and agricultural education.

Human capacity development is an essential component in the agriculture sector as it involves human resources to spread scientific knowledge to the farming community. A systematic way of capacity development in the agriculture sector requires an understanding of how different socio-economic components or processes are interlinked and how these influence each other. Capacity development at the individual or organizational level may not be of much use if there

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are systematic impediments to performance, such as poor incentives or lack of access to resources. It is more than acquisition of skills by a particular individual, community organization or line department and includes a systematic dimension (UNDP, 1998).

This chapter highlights the processes and approaches of capacity development activities developed in a mission mode project implemented by the Government of Karnataka, India, from 2009 to boost productivity of rainfed agriculture in the state of Karnataka. Unique mechanisms have been developed to enhance the capacity of farmers, community and organizations.

4.2 Framework for Human Capacity Development

Human capacity development plays a key role in economic growth and development because human beings occupy the centre of the production, distribution and consumption chain. From a macroeconomics perspective, the improvement of human capital productivity facilitates technological innovations, increases returns to capital and makes economic growth more sustainable (Chimboza, 2012). Because of agriculture being a multidisciplinary subject, regular human capacity development assumes much more importance. In the current context of demographic pressure, climate change, economic and other considerations, capacity building in agriculture is the need of the hour. Indian agriculture needs to be rejuvenated with new scientific research/knowledge and a new extension system. With increasing risks and uncertainties, agricultural ventures must be attractive, profitable and sustainable to induce economic growth. These major attributes can be achieved through scientific research to develop quality inputs, improve agronomic practices and develop good management skills. Likewise, agricultural extension services ought to be upgraded to provide the education needed to modernize production practices and change past ways and perceptions of agriculture as a means of subsistence to a feasible business opportunity.

It is imperative to provide scientific research-based knowledge in order to enhance the capacity of not only programme implementers but also extension agents as well as farmers. The declining rate of extension personnel in the agriculture sector has contributed to low level adoption of science-led innovations thereby adversely affecting agricultural growth in the state (Government of Karnataka, 2006). Low technology in the agriculture sector has hindered the production of high-value products that generates employment and income (Government of Karnataka, 2011).

During 2009, the Government of Karnataka initiated implementation of an innovative agricultural development programme called 'Bhoochetana' with the aim to enhance agricultural productivity for

improving rural livelihoods in the rainfed system through a science-led integrated approach. This initiative provided an opportunity to train youths particularly in the agriculture sector to perform extension activities. The Government of Karnataka is collaborating with many international agricultural organizations/agencies and institutions to organize and conduct training programmes and awareness campaigns to develop young innovative/progressive farmers as extension experts for disseminating scientific knowledge.

This framework largely focuses on developing capacity at the bottom two levels – the organization and the individual/farmer – although consideration has been given to targeted initiatives (in a range of areas) at the other two levels (i.e. environmental and sectoral levels) (Fig. 4.1). For practical purposes, the framework focuses on building capacity of agricultural officers of the state, district, taluk/block and *Raithu Samparka Kendra* (RSK) as they are directly responsible for agricultural management in the state.

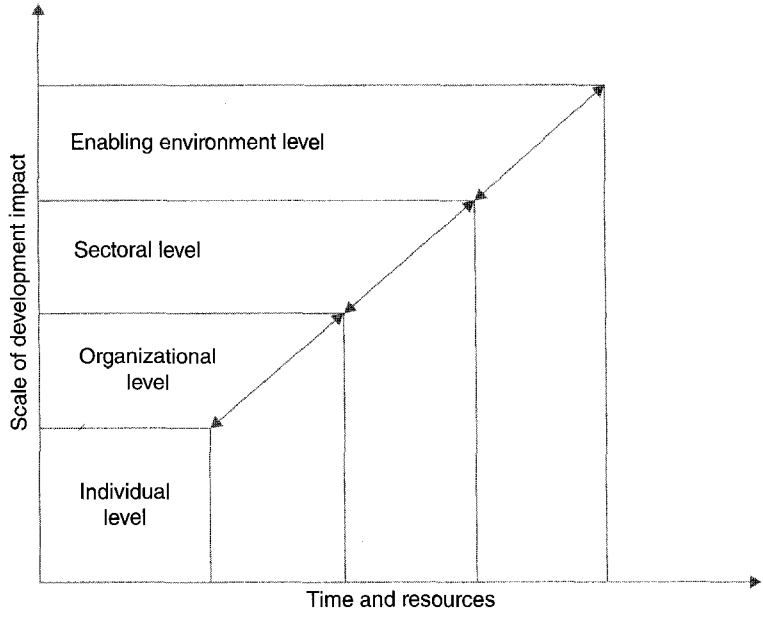


Fig. 4.1. Levels of capacity development.

4.3 Linking Knowledge to Action through Capacity Development

There is now emerging evidence that regenerative and resource-conserving technologies and practices can bring both environmental and economic benefits for farmers and communities (Wani *et al.*, 2003; Rockström *et al.*,

2007). The best evidence comes from countries of Asia and Africa where the concern is to increase food production in the areas where farming has been marginalized due to fragmentation and limited use of technologies (Rockström *et al.*, 2007). In these complex and remote lands, some farming communities adopting regenerative technologies have substantially improved agricultural yields (Wani *et al.*, 2003; Rockström *et al.*, 2007, 2010). The common element of these successes was that farmers have made use of resource-conserving technologies such as: (i) integrated pest management; (ii) soil and water conservation; (iii) integrated nutrient management; (iv) crop diversification; and (v) water harvesting (Wani *et al.*, 2003). Farmer groups/communities at the local level have become experts at managing farms as ecosystems and benefit from them. Moreover, there have been supportive and enabling external government and/or non-governmental organizations (NGOs), often working in new partnerships with new participatory approaches, which have reoriented their activities to focus on local needs (Wani *et al.*, 2012).

Bhoochetana is a science-led participatory approach, which emerged from the lessons learnt from long-term watershed-based research led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, and national partners (Wani *et al.*, 2003). This interdisciplinary research, over the years, has shaped up into an integrated genetic natural resource management approach within ICRISAT (Twomlow *et al.*, 2006). After realizing the importance and potential of combining disciplinary expertise in a complementary way, the idea of the consortium approach based on the multidisciplinary approach at the research station was adopted. The consortium is a convergence of agencies/actors/stakeholders that have a significant role to play in a watershed development project (Wani *et al.*, 2003). Facilitated by a leader/leading organization, member organizations prepare common plans and work towards achieving the agreed common objectives. This approach was first adopted during 1999. The Asian Development Bank came forward to support ICRISAT's idea of testing the consortium model in a watershed in Kothapally village of the Rangareddy district in Andhra Pradesh (now Telangana state) called the Adarsha watershed, to minimize the gap between research findings and on-farm development. The purpose was also to adopt the learning loop in planning of strategic research based on participatory research and development. The innovative integrated watershed management model has demonstrated that with proper management of natural resources the system's productivity can be enhanced and poverty can be reduced without causing further degradation of the natural resource base. The scaling up of these innovations has been attempted in countries such as India, Vietnam, Thailand and China.

The Bhoochetana mission project is a cost-share project with principles of convergence, consortium, capacity building and collective

action, inspired by the Sujala–ICRISAT initiative (Wani *et al.*, 2012). Farmers participate in the project on an individual basis and carry out land rejuvenation on their own land, while the Department of Agriculture (DoA) provides extension services, seeds and fertilizers (micronutrients) with 50% incentives. The idea behind Bhoochetana was to support the interest in soil conservation already present among farmers. The project idea was developed during the brainstorming session organized by the government in 2008. In 2009, ICRISAT formed a consortium with state agricultural universities (SAUs), line departments such as the DoA, Watershed Development Department (WDD), the Directorate of Economics and Statistics (DES), community-based organizations and farmers for the project. The consortium collectively took part in planning and promoting the project activities. The project activities were designed for six districts during the first year and during the second year upscaled to 16 districts (including the six districts). After realizing the success, during the third year the project activities were scaled up to the entire state. The project 'Bhoochetana' then became a mission project for the government and the consortium provided technical support.

The innovativeness of this project includes identification of soil nutrient deficiency status and taluk-wise nutrient recommendations based on nutrition status supported by making available the necessary inputs at 50% subsidy. The major focus of the project is on both dry-land and irrigated crops. For timely and easy availability of inputs, advance positioning of inputs was done at the cluster-village-level and RSKs at every *hobli* (group of villages). These inputs (seeds, seed treatment chemicals, gypsum, micronutrients and biofertilizers) have been supplied as a package. To operationalize the project, the services of farm facilitators (FFs) to take technologies to the farmer's doorstep were utilized. This was followed by 1 week of institutional training to all the FFs to update their knowledge about the technologies. Village meetings were held and there was wide publicity through mass media and wall writings in each of the selected villages. Above all, the convergence of all the existing schemes of the DoA channelled through Bhoochetana was the innovative strategy. The DoA is formally responsible for the project, while the consortium supervises daily activities at different levels. Timelines are defined clearly for covering productivity enhancements in 30 districts; soil sampling and nutrient analysis mapping and capacity building of stakeholders during the project period are shown in Table 4.1.

4.4 Consortium and Collective Action for Human Capacity Development

Capacity development, particularly in agriculture, is a challenging task which requires multidisciplinary experts to impart knowledge. This is,

Table 4.1. Timeline for execution of activities in Bhoochetana districts.

		Activity coverage (%)		
Activity	Year	Districts 1–6	Districts 7–16	Districts 17–30
Productivity enhancement	2009	25		
	2010	50	33	
	2011	75	66	50
	2012	100	100	100
Nutrient status mapping	2009	100		
	2010		100	
	2011			100
	2012			
Capacity building	2009	100		
	2010		100	
	2011			100

therefore, possible through a consortium approach. A consortium is a combination of organizations/institutions who organize the development, dissemination and delivery of new technologies, strategies and methods for achieving holistic development. In Bhoochetana, one of the objectives was to strengthen the partnership by bringing SAUs, *Krishi Vigyan Kendras* (KVKs), line departments along with the international agricultural research institute (ICRISAT) for bridging the knowledge gap existing among farmers, researchers and line departments so as to achieve productivity enhancement (Raju *et al.*, 2013). The Bhoochetana programme is a culmination of efforts by the policy makers, bureaucrats, scientists, extension agents, farmers and other stakeholders. This initiative has shown the way of partnering for strengthening the agricultural production system.

In Bhoochetana, a consortium of knowledge-generating institutions like the SAUs (Bengaluru, Dharwad and Raichur) and ICRISAT along with knowledge-disseminating line departments, such as the DoA, WDD and KVKs, was formed with the aim to impart knowledge, skills and technologies to the farming community (Fig. 4.2). The role of the consortium partners was to enhance the awareness of stakeholders to adopt improved technologies to achieve sustainable crop production. Each consortium partner has a specific responsibility for enhancing the capacity of different stakeholders in the project. The Bhoochetana consortium has assigned specific roles and responsibilities to respective partners so as to avoid duplication and delay in implementation as well as delivering the outputs.

4.4.1 Department of Agriculture (DoA)

As a nodal agency, the DoA is responsible for overall coordination of the programme for smooth implementation. The DoA issues timely guidelines

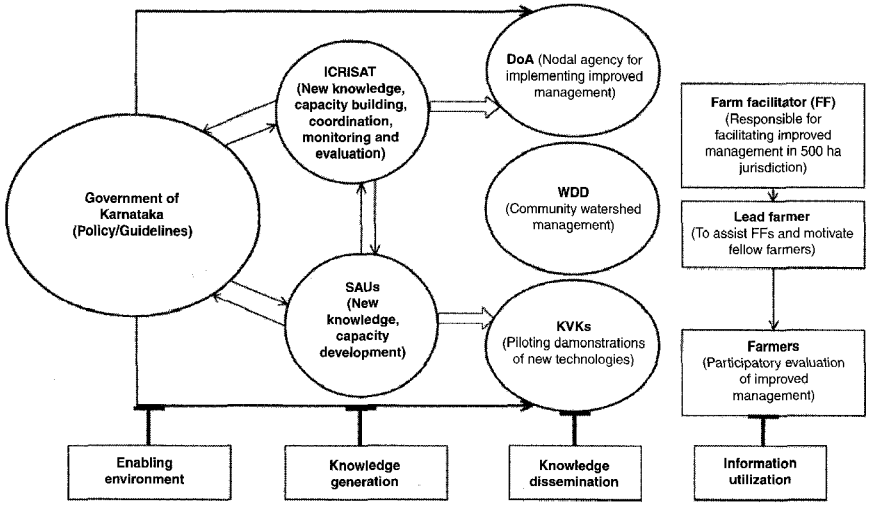


Fig. 4.2. Consortium of partners in the Bhoochetana programme in Karnataka. DoA, Department of Agriculture; FF, farm facilitators; KVKs, *Krishi Vigyan Kendras*; SAUs, state agricultural universities; WDD, Watershed Development Department.

and circulars with new information to enable field personnel to effectively implement the programme. In addition, it organizes the training of trainers with experts from ICRISAT, SAUs, lead NGOs and line department staff for internalizing nuances of various interventions to be undertaken in the respective districts.

4.4.2 State agricultural universities (SAUs)

In an effort to bridge the gap between research organizations and the farming community, the SAUs (Bengaluru, Dharwad and Raichur) were included in the consortium and shared the responsibilities of capacity development of various actors involved in the implementation of the Bhoochetana programme in the form of master trainers. The concept of master trainers was introduced with the main objective of periodically disseminating new knowledge uniformly across actors at various levels. The master trainers were trained through training of trainers by expert scientists of ICRISAT and partner organizations, covering various issues of agricultural operations. The purpose of training of master trainers on the same wavelength was to convey the same messages down the line in simple language. However, this process was not as effective as expected. Alternatively, KVKs volunteered to impart training and conduct field demonstrations. This initiative is considered to be a strength of the consortium approach which generally complements the strengths and weaknesses of partners.

4.4.3 *Krishi Vigyan Kendras* (KVKs)

The KVKs were visualized as a technical support agency to strengthen agriculture and they have contributed to awareness building, training programmes and sharing of new technologies with the farming community. The KVKs have enhanced the capacity of FFs through organizing training programmes on integrated nutrient management, integrated pest management, improved varieties and good agricultural practices, etc. In terms of sharing scientific knowledge, they have conducted field demonstrations. However, KVKs have constraints in terms of human resources to effectively address the problems as well as organizing training programmes and demonstrations. It was observed during the discussion with KVK staff that capacity building is essential even for KVK scientists and subject matter specialists on new technologies, strategies and methods (Wani *et al.*, 2013).

4.4.4 ICRISAT

Along with the DoA as the nodal agency, ICRISAT has a big role in facilitating and handholding for smooth implementation of the initiative. As a technical support provider, ICRISAT ensures new knowledge generation, sharing of knowledge and capacity development of various stakeholders, including policy makers, researchers, line departments, farmers and others. As a facilitator, ICRISAT is responsible for regular monitoring and evaluation, generation of reports and feedback on improvements in the initiative.

4.5 Building Human Capacity at Different Levels

Effective communication among partners is a key aspect, and dialogues and deliberations provide opportunities for partners and stakeholders to share ideas, values and knowledge to have real-time capacity building. Failure of previous projects is often attributed to lack of ability of the leading organization to engage in meaningful participatory capacity building processes. In a science-led participatory approach as adopted in Bhoochetana, effective participation of all stakeholders and willingness to share responsibility is the first and foremost requirement. In this context, building human capacity at various levels received the highest priority.

4.5.1 Team-building workshops at the state level

Team-building measures help in developing stronger partnerships and internalization of operating guidelines (Shambu Prasad *et al.*, 2006).

These are strong measures that bring partners together and build a trust among the consortium partners as there is a mechanism for sharing inputs, common communication and conflict resolution.

The messages from the top have a strong bearing down the line. Therefore, the human capacity building initiatives in the Bhoochetana programme were started from the top at state level. Team-building workshops were organized for the team members of the Bhoochetana project with the objective of establishing good coordination among team members from the newly scaled-up districts and discussing the technology implementation strategies in a team spirit. The participants in the team-building workshop usually included state-level policy makers, Joint Directors of Agriculture (JDAs), Assistant Directors of Agriculture (ADAs), nodal officers of different districts from the DoA, scientists from the SAUs (Bengaluru, Dharwad and Raichur) and scientists and scientific officers from ICRISAT (Fig. 4.3). Capacity building of partners, participating farmers and sensitization of policy makers helped in building partnerships and reducing transaction costs as the programme reaped greater benefits during the first year than expected.

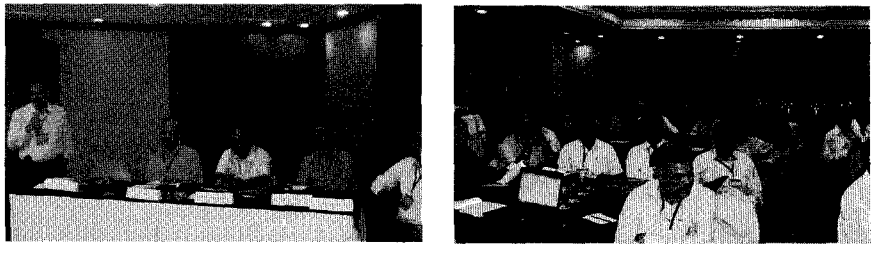


Fig. 4.3. Participants at the brainstorming workshop on soil-test-based nutrient management including boron and other micronutrients.

4.5.2 Regular review and planning workshops

Regular review and planning workshops were organized at the end of the crop season to obtain first-hand information on programme implementation, benefits accrued and other experiences. Based on the learnings, planning would be carried out for the following season well in advance. The review and planning workshops were held at ICRISAT for the obvious reasons that the partners (policy makers, line department staff, university scientists, FFs, farmers and private sector partners) would be exposed to the new working environment and work culture as well as to the team culture. These workshops acted as a catalyst to bring about periodic changes in the planning process, implementation and monitoring of different interventions. The intensive review and planning workshops were aimed at instilling new thinking into the minds of all actors as almost all stakeholders had the opportunity to put forward

their ideas in the open forum. This also provided an opportunity for all the stakeholders to learn innovative ideas and approaches so that they could implement the programme more meaningfully in their respective work areas. There was also an opportunity for private sector partners to get to know the requirements of the farming community, bureaucrats and policy makers as their presence would be seen as a blessing in disguise. Thus, the review and planning workshops were good learning opportunities for different actors to prepare evolved work plans.

The workshops were platforms for the senior officers to take bold decisions in consensus with their subordinates and partners. Innovative decisions were taken during these workshops on: (i) expanding the area coverage; (ii) input procurement, storage and distribution; and (iii) regular monitoring of progress. The expert guidance and advice from senior-level officials and scientists on finding solutions to various problems were very well valued by the partners.

4.5.3 District-level training

Capacity development programmes at the district level were targeted for heads of departments mainly from the DoA, the WDD and their team leaders managing different schemes at district level and representative officers at taluk/block level. During these training sessions, the participants were oriented to be on the same wavelength to understand implementation of the programme, input procurement, and storage, soil nutrient status in each taluk, etc. The module of the training sessions generally included lectures on specific topics by master trainers and interactive sessions for thorough understanding about implementation of the initiative. A summary of district-level training programmes conducted under Bhoochetana during the period 2009/10 to 2012/13 is given in Table 4.2. There was not only a gradual increase in the adoption of Bhoochetana activities in various districts of Karnataka but also increased participation of key decision makers at the district level (see Table 4.1). This is an indication of the high quality and relevance of the training programmes in their work.

Table 4.2. District-level training programmes organized under Bhoochetana during 2009–2013 in Karnataka.

Year	No. of districts	No. of training programmes	No. of participants
2009/10	6	19	1128
2010/11	15	38	3707
2011/12	30	77	4791
2012/13	30	46	5751

4.5.4 Taluk/block-level training

Trained taluk/block-level senior officials of the DoA, namely ADAs, organized training programmes for their line staff and implementing NGOs on: (i) soil nutrient recommendations; (ii) suitable high-yielding varieties; (iii) integrated pest management and disease management; (iv) livelihood options for the rural landless poor; and (v) best-bet management options for enhancing the productivity of the agricultural system. Under the Bhoochetana initiative, in each taluk/block, an average of ten taluk/block-level training programmes were organized annually, based on the need and convenience of participants (Table 4.3). Along with the required lectures and interactive sessions, the main focus was on hands-on training for implementing the interventions in the field. In these training sessions, leaflets/reference materials with recommendations for implementation in the field were provided for the participants.

Table 4.3. Taluk/block- and cluster-village-level training programmes organized under Bhoochetana during 2009–2013 in Karnataka, India.

		Taluk-level training		Cluster-village-level training	
Year	No. of districts	No. of programmes	No. of participants	No. of programmes	No. of participants
2009/10	6	68	930	1,806	33,996
2010/11	15	–	–	–	–
2011/12	30	318	23,446	3,873	63,912
2012/13	30	271	14,647	8,800	275,561

4.5.5 Institutional training for farm facilitators (FFs)

Appointment of educated or progressive FFs to guide fellow farmers in improved management was an innovative decision to fill in the gap in the extension system. Being from among the community, the FFs proved very effective in disseminating new technology as and when required. However, this could become feasible because of extensive initial institutional training of FFs. The critical focus of institutional training was to enhance the skill and knowledge of FFs through regular orientation programmes. Institutional training programmes were organized by the Deputy Director of the District Agricultural Training Centre (DATC) in every district. The training programmes usually ran for 5 days soon after the finalization of the district-level action plan for every season. The newly recruited FFs were given opportunities to learn the programme's implementation strategies, farmers' registration and other scientific innovations. In terms of science-led innovations, FFs would be trained on methods of soil, water and nutrient management, crop-wise nutrient recommendations, new

seed varieties and seed production, integrated pest and disease management, farmer field schools, information on various schemes/programmes of the DoA and WDD, scientific crop-cutting experiments, etc. During the course of the mission project, institutional training has become an effective way of building capacity of FFs.

4.5.6 Cluster-village-level training

Cluster-village-level training was targeted at farmers to improve their knowledge and skills for impact on the ground. The DoA line staff, FFs and lead farmers served as guides to other fellow farmers in implementation of the locally required interventions. In village-level training, the demonstrations on lead farmers' fields were used for hands-on training on targeted interventions. The technologies, which were mainly focused in Bhoochetana, and in which most of the farmers were trained, included: (i) stratified soil sampling; (ii) participatory varietal selection; (iii) seed treatment; (iv) balanced nutrition; (v) vermicomposting; (vi) integrated nutrient management; (vii) landform management; and (viii) nursery raising. These training sessions were conducted with enthusiastic participation of farmers (see Table 4.3), which led to the success of the initiative and indicated that farmers are willing to practise new technologies. However, the issue is: how do we reach them and provide holistic solutions?

4.5.7 Farmer field schools

Farmer field schools are defined as 'schools without walls', which stemmed from adult education principles and evolved to become a distinct approach that builds on the process of group learning and community action. This participatory extension method recognizes the need to involve farmers in technology development and transfer. Participating farmers are encouraged to share their knowledge with other farmers, and are sometimes trained to teach the courses themselves, thus reducing the need for external support.

In Bhoochetana, the FFs took the lead in organizing planning meetings and conducting farmer field school sessions in a selected village with 20–30 farmers. Crop-specific information was imparted through short studies and long-term experiments. Capacity building and demonstrations in all aspects of crop cultivation were imparted to the participating farmers. Almost 20 weekly sessions were held to analyse the abiotic and biotic stresses on the plant. The observations recorded in the field were pooled and farmers arrived at the subsequent conclusions themselves.

Through farmer field schools, farmers were able to take the right crop management decisions at every stage of the crop and farmers developed

the habit of visiting their fields regularly and monitoring crop pests and diseases. This extension system was found effective in imparting the required knowledge and skill of crop cultivation as there is frequent contact between farmers and FFs. Group dynamics, participatory group presentation and discussion were part of farmer field schools and as a result, a sense of cooperation and team coordination developed among farmers which were helpful in spreading and sharing the technologies with each other. The method capitalizes on existing local social networks, based on the belief that experienced and skilled farmers are the people best suited to train other farmers. The trainees familiarize themselves with the technology since they get practical training in the field where they have the opportunity to see and carry out the activities, learn from mistakes and receive advice. This approach proved a common and important vehicle for diffusing technology under Bhoochetana.

4.5.8 Field days

Field days are effective ways of information dissemination where interested farmers are invited to a particular field or plot and specific information about the technology is demonstrated and discussed. The session takes about 4–6 h and ranges from a structured presentation to an informal event where participants walk through the field plot at their own pace to view the demonstrations (Braun and Duveskog, 2008). During these field days farmers interact with FFs as well as with other farmers and exchange ideas and experiences. In Bhoochetana, field days were organized with the full support and participation of the DoA district-level staff during all seasons and for all important crops of the district. The average participants in each field day ranged between 50 and 75 farmers with high participation of men (Table 4.4). However, nearly 30% of participants were women farmers (i.e. the average number of women participants per field day ranged from 14 to 22). This indicates the increasing gender participation (equity) in agricultural development.

Table 4.4. Field days organized under Bhoochetana during 2010–2013 in Karnataka, India.

		No. of participants	
Year	No. of field days	Men	Women
2010/11	203	10,939	4,554
2011/12	596	30,543	9,980
2012/13	4,353	159,239	61,800

4.5.9 Awareness campaigns in the villages

There are various types of awareness methods used for effective dissemination of knowledge to farmers and to create awareness about new technologies, practices and methods of cultivation. These methods include wall writings, soil health cards, brochures and handouts, cycle *jathas* (a long march, usually aimed at spreading a message), street plays and *Bhoochetana rath* (Bhoochetana awareness vehicle). Until 2012–2013, nearly 60,000 wall writings were written on the walls of public properties such as bus stops and panchayat buildings, covering about 26,000 villages across 30 districts.

4.6 Tools to Create Awareness and Skill Development

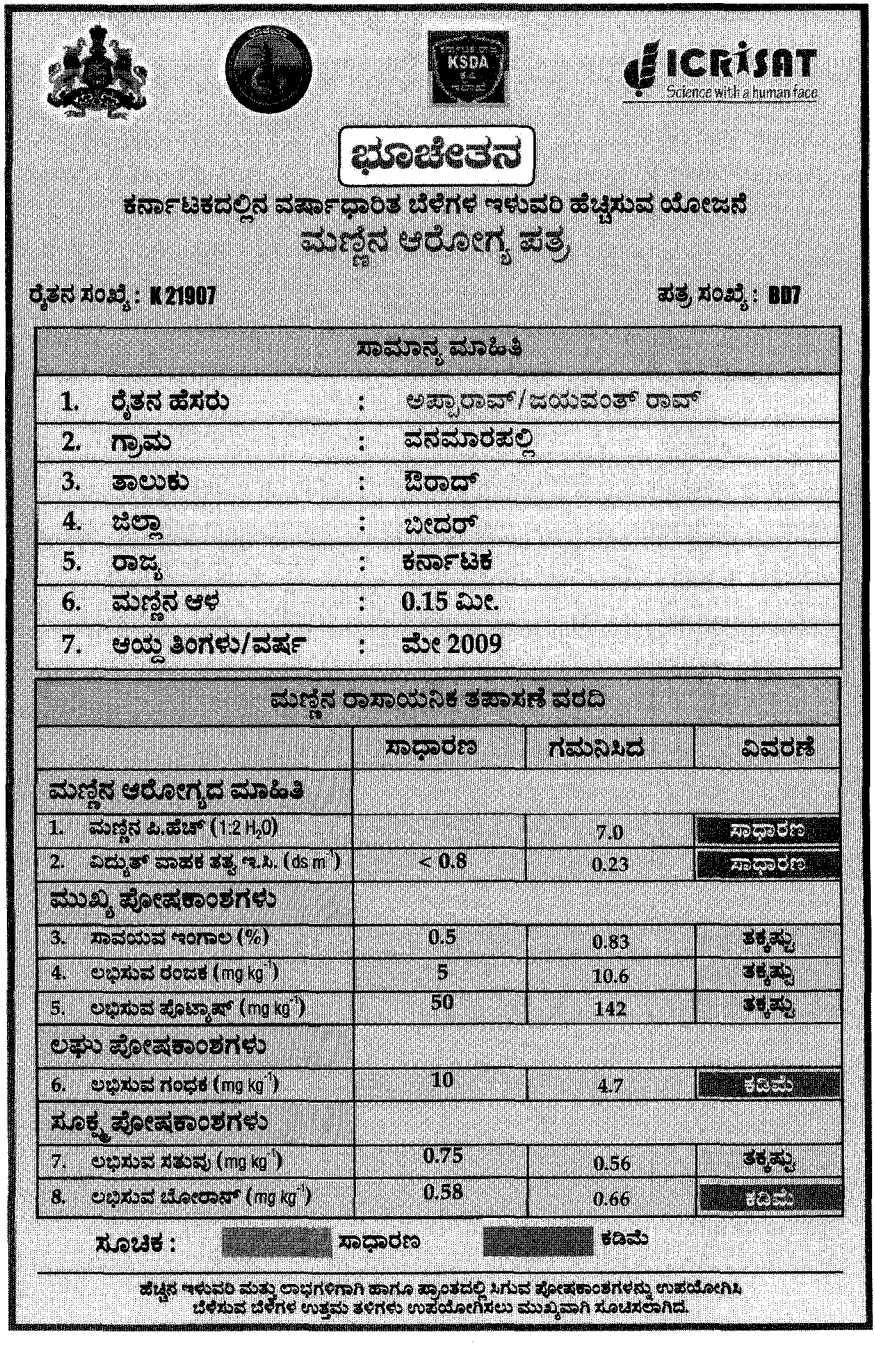
4.6.1 Soil health cards

A total of 92,904 soil health cards were provided to individual farmers whose fields were sampled. The card was printed on both sides in the local language (Kannada) giving basic information about the farmer's field with details of individual nutrient status and critical limits of the field (Fig. 4.4). Also, the recommended dose of nutrients for each crop was included as well as the quantity of nutrients available in commercially marketed fertilizers.

4.6.2 Wall writings and media

Under the Bhoochetana initiative wall writings were done in each and every village to create awareness among the farmers. Wall writings were quite conspicuous with details of, for example, the soil health status, input quantities per hectare supplied to the farmer and components of inputs (i.e. micronutrients). Wall writings are an effective communication channel in rural areas which gained momentum in Bhoochetana on a large scale, helping farmers to understand their soil and agricultural practices, the objective of the programme and areas to be covered by the programme (Fig. 4.5). Additionally, thousands of brochures and handouts were published and distributed in each district on improved management practices, information on nutrient status, and nutrients recommended taluk-wise; brochures were widely distributed in all 30 districts (Fig. 4.6).

Print media news coverage was extensive to introduce the Bhoochetana programme to farmers and also provide information on activities during the season in all districts and contacts of FFs and lead farmers with individual farmers in selected villages.



ICRISAT
Science with a human face

ಭೂಚೇತನ

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4. ಲಭಿಸುವ ರಂಜಕ (mg kg^{-1})	5	10.6	ತಕ್ಕಷ್ಟು
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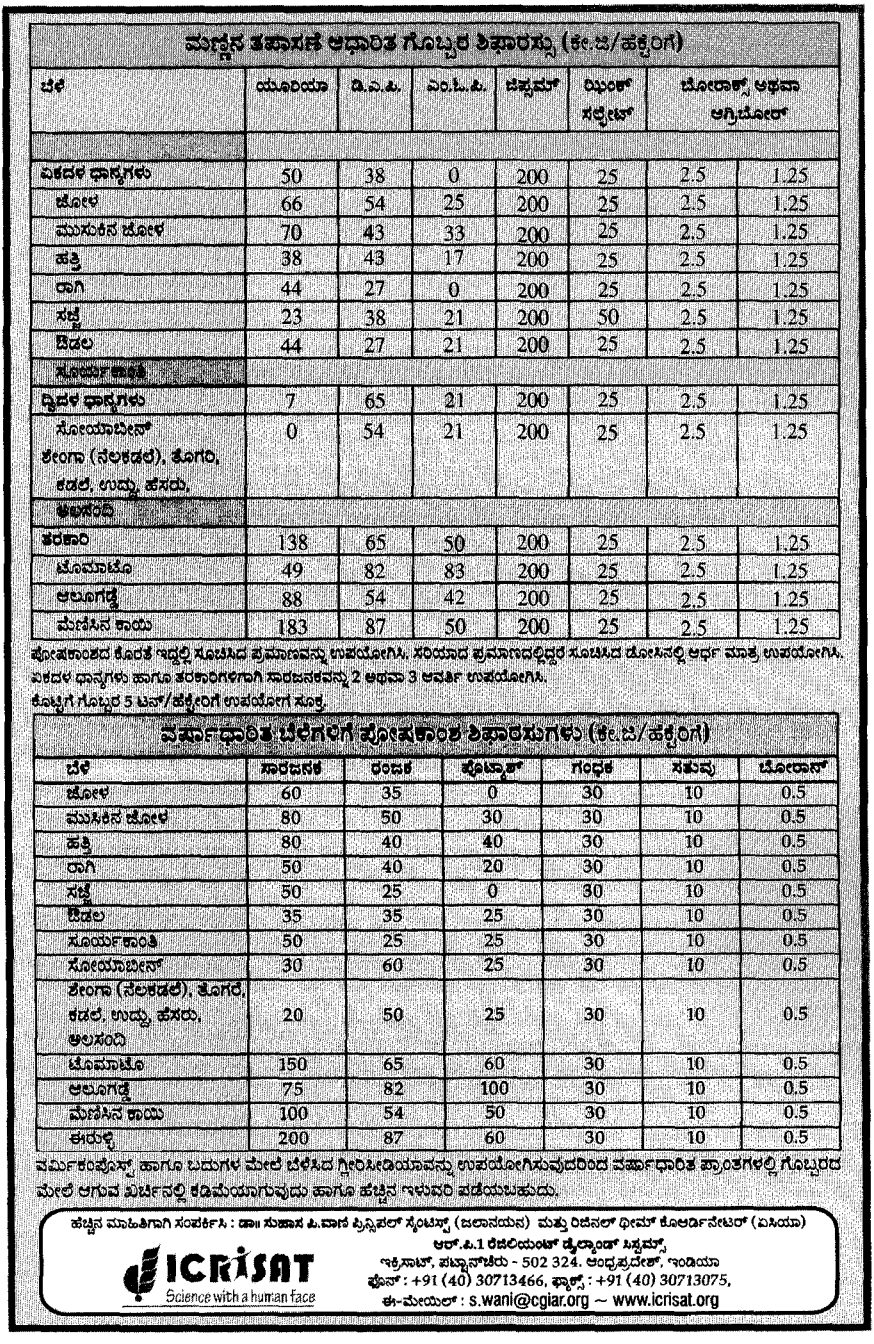
6. ಲಭಿಸುವ ಗಂಧಕ (mg kg^{-1})	10	4.7	ಕಡಿಮೆ
ಸೂಕ್ಷ್ಮ ಪೋಷಕಾಂಶಗಳು			
7. ಲಭಿಸುವ ಸತುವು (mg kg^{-1})	0.75	0.56	ತಕ್ಕಷ್ಟು
8. ಲಭಿಸುವ ಬೋರಾನ್ (mg kg^{-1})	0.58	0.66	ಕಡಿಮೆ

ಸೂಚಕ : ಸಾಧಾರಣ ಕಡಿಮೆ

ಹೆಚ್ಚಿನ ಇಳುವರಿ ಮತ್ತು ಲಾಭಗಳಿಗಾಗಿ ಹಾಗೂ ಪ್ರಾಂತದಲ್ಲಿ ಸಿಗುವ ಪೋಷಕಾಂಶಗಳನ್ನು ಉಪಯೋಗಿಸಿ ಬೆಳೆಸುವ ಬೆಳೆಗಳ ಉತ್ತಮ ತಳಗಳು ಉಪಯೋಗಿಸಲು ಮುಖ್ಯವಾಗಿ ಸೂಚಸಲಾಗಿದ.

Fig. 4.4. Soil health cards with details printed in Kannada on both sides of the sheet.



ಮಣ್ಣಿನ ತಪಾಸಣೆ ಆಧಾರಿತ ಗೊಬ್ಬರ ಶಿಫಾರಸ್ಸು (ಕೇ.ಜಿ/ಹೆಕ್ಟೆರಿಗೆ)

ಬೆಳೆ	ಯೂರಿಯಾ	ಡಿ.ಎ.ಪಿ.	ಎಂ.ಓ.ಪಿ.	ಜಿಪ್ಸಮ್	ಝಿಂಕ್ ಸಲ್ಫೇಟ್	ಬೋರಾಕ್ಸ್ ಅಥವಾ ಅಗ್ರಿಬೋರ್	
ಏಕದಳ ಧಾನ್ಯಗಳು	50	38	0	200	25	2.5	1.25
ಜೋಳ	66	54	25	200	25	2.5	1.25
ಮುಸುಕಿನ ಜೋಳ	70	43	33	200	25	2.5	1.25
ಹತ್ತಿ	38	43	17	200	25	2.5	1.25
ರಾಗಿ	44	27	0	200	25	2.5	1.25
ಸಜ್ಜೆ	23	38	21	200	50	2.5	1.25
ಬಿಡಲ	44	27	21	200	25	2.5	1.25
ಸೂರ್ಯಕಾಂತಿ							
ದ್ವಿದಳ ಧಾನ್ಯಗಳು	7	65	21	200	25	2.5	1.25
ಸೋಯಾಬೀನ್ ಶೇಂಗಾ (ನೆಲಕಡಲೆ), ತೊಗರಿ, ಕಡಲೆ, ಉದ್ದು, ಹೆಸರು,	0	54	21	200	25	2.5	1.25
ಅಲಸಂದಿ							
ತರಕಾರಿ	138	65	50	200	25	2.5	1.25
ಟೊಮಾಟೊ	49	82	83	200	25	2.5	1.25
ಆಲೂಗಡ್ಡೆ	88	54	42	200	25	2.5	1.25
ಮೆಣಸಿನ ಕಾಯಿ	183	87	50	200	25	2.5	1.25

ಪೋಷಕಾಂಶದ ಕೊರತೆ ಇದ್ದಲ್ಲಿ ಸೂಚಿಸಿದ ಪ್ರಮಾಣವನ್ನು ಉಪಯೋಗಿಸಿ. ಸರಿಯಾದ ಪ್ರಮಾಣದಲ್ಲಿದ್ದರೆ ಸೂಚಿಸಿದ ಡೋಸಿನಲ್ಲಿ ಅರ್ಧ ಮಾತ್ರ ಉಪಯೋಗಿಸಿ.
ಏಕದಳ ಧಾನ್ಯಗಳು ಹಾಗೂ ತರಕಾರಿಗಳಿಗಾಗಿ ಸಾರಜನಕವನ್ನು 2 ಅಥವಾ 3 ಅವರ್ತಿ ಉಪಯೋಗಿಸಿ.
ಕೊಟ್ಟಿಗೆ ಗೊಬ್ಬರ 5 ಟನ್/ಹೆಕ್ಟೇರಿಗೆ ಉಪಯೋಗ ಸೂಕ್ತ.

ವರ್ಷಾಧಾರಿತ ಬೆಳೆಗಳಿಗೆ ಪೋಷಕಾಂಶ ಶಿಫಾರಸುಗಳು (ಕೇ.ಜಿ/ಹೆಕ್ಟೆರಿಗೆ)

ಬೆಳೆ	ಸಾರಜನಕ	ರಂಜಕ	ಪೊಟ್ಯಾಶ್	ಗಂಧಕ	ಸತುವು	ಬೋರಾನ್
ಜೋಳ	60	35	0	30	10	0.5
ಮುಸಿಕಿನ ಜೋಳ	80	50	30	30	10	0.5
ಹತ್ತಿ	80	40	40	30	10	0.5
ರಾಗಿ	50	40	20	30	10	0.5
ಸಜ್ಜೆ	50	25	0	30	10	0.5
ಬಿಡಲ	35	35	25	30	10	0.5
ಸೂರ್ಯಕಾಂತಿ	50	25	25	30	10	0.5
ಸೋಯಾಬೀನ್	30	60	25	30	10	0.5
ಶೇಂಗಾ (ನೆಲಕಡಲೆ), ತೊಗರಿ, ಕಡಲೆ, ಉದ್ದು, ಹೆಸರು, ಅಲಸಂದಿ	20	50	25	30	10	0.5
ಟೊಮಾಟೊ	150	65	60	30	10	0.5
ಆಲೂಗಡ್ಡೆ	75	82	100	30	10	0.5
ಮೆಣಸಿನ ಕಾಯಿ	100	54	50	30	10	0.5
ಈರುಳ್ಳಿ	200	87	60	30	10	0.5

ವರ್ಮಿಕಂಪೋಸ್ಟ್ ಹಾಗೂ ಬದುಗಳ ಮೇಲೆ ಬೆಳೆಸಿದ ಗ್ಲಿರಿಸೀಡಿಯಾವನ್ನು ಉಪಯೋಗಿಸುವುದರಿಂದ ವರ್ಷಾಧಾರಿತ ಪ್ರಾಂತಗಳಲ್ಲಿ ಗೊಬ್ಬರದ ಮೇಲೆ ಆಗುವ ಖರ್ಚನ್ನಲ್ಲಿ ಕಡಿಮೆಯಾಗುವುದು ಹಾಗೂ ಹೆಚ್ಚಿನ ಇಳುವರಿ ಪಡೆಯಬಹುದು.

ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ ಸಂಪರ್ಕಿಸಿ : ಡಾ॥ ಸುಹಾಸ ಪಿ.ವಾಣಿ ಪ್ರಿನ್ಸಿಪಲ್ ಸೈಂಟಿಸ್ಟ್ (ಜಲಾನಯನ) ಮತ್ತು ರಿಜನಲ್ ಥೀಮ್ ಕೋಆರ್ಡಿನೇಟರ್ (ಏಸಿಯಾ)

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ಆರ್.ಪಿ.1 ರಿಜಿಸ್ಟರಿಯಂಟ್ ಹೈದ್ರಾಂಡ್ ಸಮ್ಸ್,
ಇಕ್ರಿಸಾಟ್, ಪಟ್ಟಾನ್‌ಚೆರು - 502 324. ಆಂಧ್ರಪ್ರದೇಶ್, ಇಂಡಿಯಾ
ಫೋನ್ : +91 (40) 30713466, ಫ್ಯಾಕ್ಸ್ : +91 (40) 30713075,
ಈ-ಮೇಯಿಲ್ : s.wani@cgiar.org ~ www.icrisat.org

Fig. 4.4. Continued.

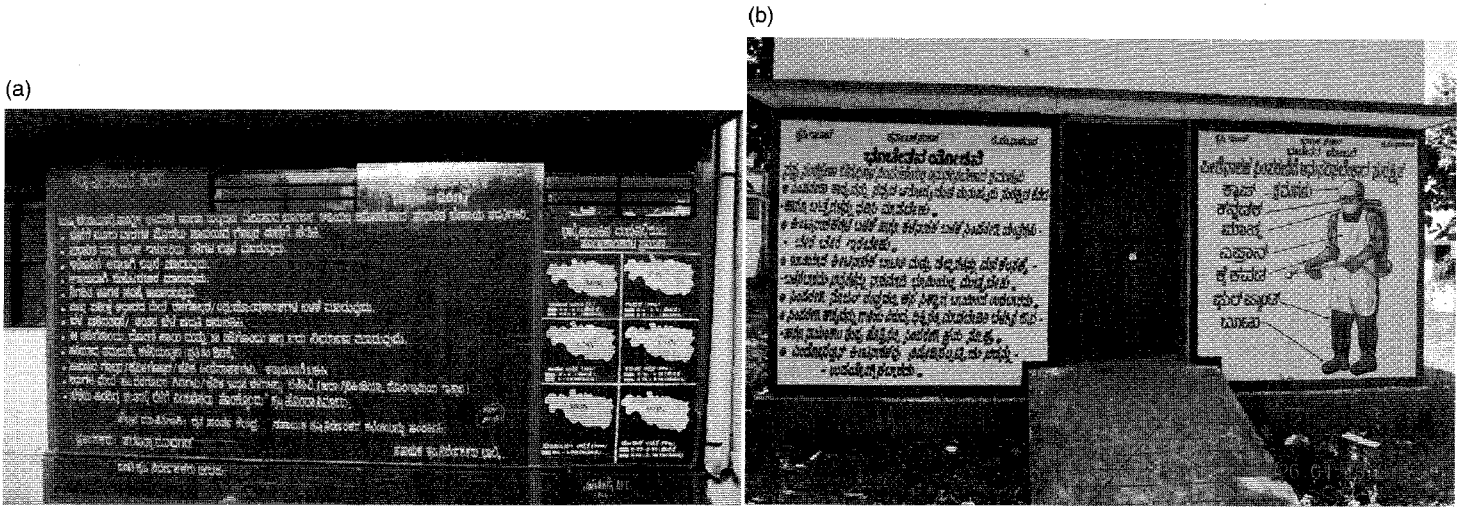

Fig. 4.5. Wall writings on Bhoochetana in Karnataka written in Kannada on: (a) Bhoochetana activities in Bidar district; and (b) integrated-pest-management technologies and their use in farmers' fields for enhancing productivity in Dharwad district.

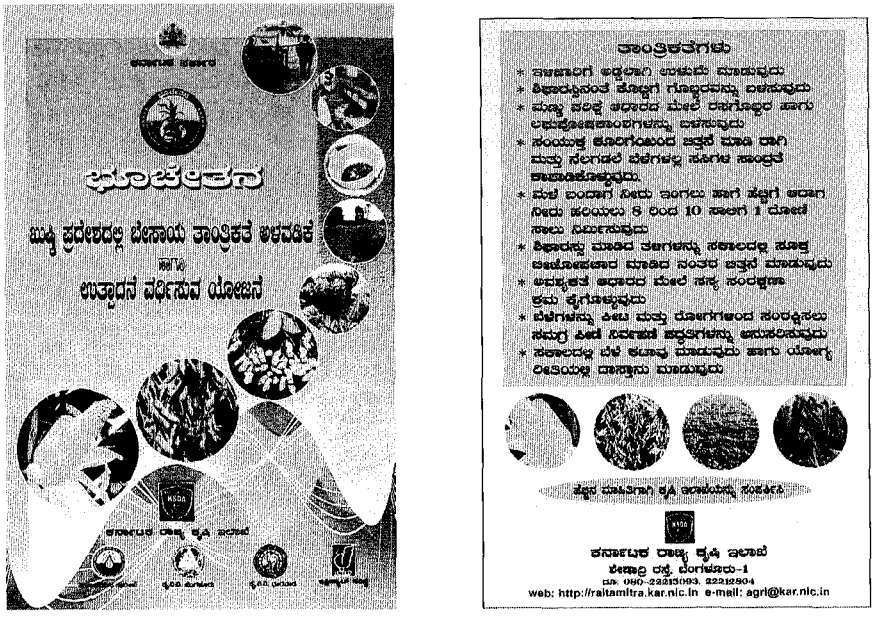

Fig. 4.6. Information brochures and leaflets on Bhoochetana in Kannada.

4.6.3 Internet

Considering the expanding reach of the Internet, information on Bhoochetana was extensively circulated on the Internet. Detailed objectives and the framework of the initiative, along with technical information on soil health mapping, recommendations and other best practices, were made available to various stakeholders.

4.6.4 Tablet-based knowledge sharing

Use of e-tablets is an innovative step towards improving the extension system under the Bhoochetana initiative; e-tablets have proved very effective to pass on real-time information on managing various issues as well as being useful for two-way interactions (see Chapter 5 of this book).

4.6.5 Farmer-to-farmer videos for sharing success stories

Considering the fact that farmers quickly follow the success of fellow farmers, video recording of success stories of various interventions

were recorded and shared with other fellow farmers through Pico projectors. This technology proved to be very effective as it does not have any big requirements but rather few farmers can sit in small groups anywhere and watch the video and learn the way to success (more details are in Chapter 5 of this book). More than 50 short videos were recorded from four districts and are uploaded onto YouTube for wider dissemination. The topics covered include: (i) seed treatment; (ii) benefits of RSKs; (iii) soil testing; (iv) the importance of micronutrients; and (v) a seed germination test.

4.7 Summary

The new strategy for human capacity development in the Bhoochetana initiative, as explained above, has had a large impact on agricultural development in the state of Karnataka. The new strategies for reviving traditional capacity development methods paid rich dividends to the state as a whole. It is believed that if science-led research is to achieve a real impact on farm productivity and livelihoods, new methodologies for human capacity development have to be adapted along with a new extension system. The innovative approaches such as master trainers, institutional training for FFs and video conferences have a strong bearing on improving the knowledge flow, skill improvement as well as decision-making processes. Through regular capacity development programmes, a large number of stakeholders have benefited in improving their skills, knowledge and understanding about the programme in general and agriculture in particular.

For further improvement of these strategies some suggestions include:

- It is essential for the SAUs to be proactively involved in capacity development activities as well as in conducting demonstrations to disseminate field-based knowledge.
- The KVKs should be recognized and provided with responsibilities for demonstrations, capacity development and information/knowledge dissemination.
- Regular capacity development programmes at different levels should be organized for different stakeholders to enhance their understanding, knowledge and skills regarding agricultural development.

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