

Knowledge of Field Staff and Their Constraints in Transfer of Technologies in Watershed Programmes

N. Loganandhan¹ and Bankey Bihari²

ABSTRACT

Watershed development programme is the well known approach for rural development. But, field level staffs of NGO and State department are unable to utilize this approach to its maximum capacity due to some constraints. It is imperative to assess those constraints, which prevent them in transfer of technologies. It is equally important to study their knowledge level with regard to those technologies and their opinion on the most suitable extension methods for their transfer. With these objectives a research project was run at Bellary district of Karnataka. The results showed that the knowledge level of field staff ranged between 40 to 70 percent. In which state department staff bettered the NGO staff. Group meetings (91.67%) and study tours (90.28%) were considered as the most effective methods for transferring soil and water conservation technologies in watershed programmes. Irregular release of fund, insufficient staff, changes in guidelines and difficulty in convincing farmers were the predominantly quoted constraints by the majority of the field staff.

Watershed development is increasingly seen as the lynchpin of rural development in dry land areas – one that integrates sectors and provides the foundation for subsequent development (Joy *et al*, 2006). It is considered as one of the time tested approaches to the progress of rainfed areas by various government and non-government organizations. The Karnataka state government runs a separate commission for watershed development and almost all the NGOs in the state involve themselves in various projects.

The role of field level staff of NGOs and state department is very crucial in any watershed development programme. In order to make watershed development projects participatory and sustainable, it is suggested that bottom-up planning by involving reputed local NGOs must be encouraged from the beginning of the project (Sudan, 2002). It is equally important to ensure that the knowledge base of those staff is strong enough to carry out such a quality and process-intensive programme.

In the tracts of arid and semi-arid regions, the knowledge base is not sufficient or at any rate not

systematically documented in an accessible form. The extent of interaction between field level agencies and the research system and between different NGOs active in this arena to exchange experiences, identify field level problems that need further study and get researchers to provide feedback on solutions must increase. A systematic and sustained effort to collate and update the knowledge from research stations and field experience, identify gaps needing further research, keep updated and promote closer interactions between the agencies involved is therefore essential to make watershed programmes more effective (Vaidyanathan, 2006). So, it is essential to identify the resource centres from which these staffs access their technologies and the level of their knowledge with regard to those technologies.

In spite of having a rich knowledge, gained from the research stations and field experience, there may be some constraints, which prevent these staffs in transferring those technologies. So, it is also important to identify and analyze those constraints, which are refraining them in executing their work. Being a research organization on Natural Resource Management, the Central Soil and

¹Scientist, Senior Scale (Ag. Extension), CSWCRTI, Research Centre, Bellary- 583104.

² Senior Scientist (Ag. Extension), CSWCRTI, Deharadun- 248195.

Water Conservation Research and Training Institute (CSWCRTI), Dehradun, sought to find out these information. Hence, a research project was initiated by considering the issues given below to get an overall vision of the reasons behind this problem.

1. What are all the resource centres available for developing transferable technologies for the watershed development programmes in a given region?
2. What are all the technologies developed by those resource centres?
3. To what extent the functionaries working in the field are aware or known of those technologies?
4. What is the opinion of those functionaries regarding the best suited extension approaches for transferring those technologies?
5. What are all the constraints faced by them in dealing with those technologies in the watershed development projects?

This project was started in the year 2005 and simultaneously run in all the eight regional centres of CSWCRTI, Dehradun. This paper deals with the results obtained from the study conducted at the regional centre in Bellary, Karnataka, a semi-arid region of India.

METHODOLOGY

Two watersheds, namely, Upparahalla (sub watershed-IV) and Kalvi-I, Bellary, were selected for carrying out the study. The Upparahalla watershed was under KAWAD (Karnataka Watershed Development) project, governed by the NGO, MYRADA at Hosahalli from 1999-2004. The Kalvi watershed was under Desert Development Project (DDP-VI) maintained by the NGO, SNEARDS, at Hadagalli, from 2001-2005.

The possible resource centres of technologies available for developing these watersheds were identified. Subsequently, those technologies were collected and compiled into a coherent document. The technologies were categorized into different classes based on their nature such as agronomical, mechanical, and vegetative, or on the basis of their usage such as individual-oriented, group-oriented or organization-oriented. Further, the details of those technologies were shown to and scrutinized by the experts of the concerned fields, in order to bring out a logical set.

Later, a questionnaire was developed by incorporating this scrutinized logical set of technologies

for the purpose of interviewing the field staff. Further, field level functionaries (staff of both the NGOs and State Government) were identified and interviewed using this questionnaire. Major focus of these interviews was to know the level of their knowledge with regard to these technologies. They were also asked to give their opinion on the most suitable approaches to transfer soil and water conservation (SWC) technologies in watersheds and the constraints faced by them in this regard.

RESULTS AND DISCUSSION

Following are the identified resource centres which were considered to have accessibility to NGOs and State Government organizations located in this region, i.e., Bellary district of Karnataka, for likely transfer of technologies to their fields.

1. Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Research Centre, Bellary.
2. Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad.
3. University of Agricultural Sciences (UAS), Dharwad.
4. All India Coordinated Research Project for Dryland Agriculture (AICRPDA), Bangalore.
5. Operational Research Project (ORP-Watershed), Bangalore.
6. All India Coordinated Research Project for Dryland Agriculture (AICRPDA), Bijapur.
7. Karnataka State Department Training Centre for Soil and Water Conservation (KSDTCSWC), Bijapur.

The technologies were classified as shown in the Table 1.

It is known from the Table 1, that agronomical technologies are mostly individual oriented (94%), rather than that of group or organization. The fact that agronomical measures form the basis of crop production, which was followed by the farmers from time immemorial, naturally they were of predominantly individual oriented. Whereas, majority of the mechanical measures, by the nature of high cost involved in them, could possibly be implemented by a group or an organization. So, the results depict the fact that they were mostly of group or organization oriented (58.5%). In case of vegetative technologies also, an individual can go for

Table 1. Classification of soil and water conservation technologies

Type of technology	Orientation of Usage				Total f
	Individual f (%)	Individual/Group f (%)	Group/Organization f (%)	Individual/Group/Organization f (%)	
Agronomical	47 (94)	1 (2)	0	2 (4)	50
Mechanical	14 (29)	0	28 (58.5)	6 (12.5)	48
Vegetative	22 (82)	0	3 (11)	2 (7)	27
				Grand total	125

without much need for any group action or help from any organization. So, maximum technologies (82 %) were individual oriented.

The knowledge exposure of field level extensionaries regarding the above stated technologies was assessed and presented in Table 2. In total 24 numbers of respondents were studied (10-NGO staff, 14-State department staff).

The level of knowledge of NGO staff was almost equal in all the three types of technologies i.e. agronomical (40.4 %), mechanical (43.3 %) and vegetative (42.6 %). This might be due to the reason that the NGOs had their staff equally distributed in all the above mentioned specialized areas. Though their level of knowledge was comparatively lower (less than 50 %) than the state department staff (more than 50 %), they apparently had equal level of knowledge in all the three fields.

In case of State department staff, their knowledge level was more with regard to agronomical measures (77.9

Table 2. Knowledge level of watershed staff (NGO and State department) with regard to SWC technologies

Particulars	Agronomical Technologies (50 No.)		Mechanical Technologies (48 No.)		Vegetative Technologies (27 No.)	
	NGO	State Dept.	NGO	State Dept.	NGO	State Dept.
Technologies known by the staff (Mean)	20.2	38.9	20.8	33.7	11.5	13.7
Percentage	40.4	77.9	43.3	70.2	42.6	50.8

%) followed by mechanical (70.2 %) and vegetative measures (50.8 %). This shows that similar to farmers, the state department staffs also possess more knowledge with regard to agronomical measures as they are mostly of production oriented activities and their interaction with the farmers was predominantly on the issues of crops and cropping system.

Further, despite the reason that mechanical technologies were mostly of protection oriented, their knowledge was almost closer (70.2 %) to that of agronomical measures. This could be due to the reason that they might have undergone specialized training programmes on these aspects, unlike farmers.

In case of vegetative technologies, their level of knowledge was comparatively low (50.8 %). This shows that their intervention in the field with regard to vegetative measures was much low. Role of vegetation to stabilize the engineering structures was mentioned as very vital in many studies. In the new approach and technology, the ultimate aim is to establish vegetation and a series of filtering and flexible structure-gabions, loose boulder structures are installed to promote the growth of vegetation for sustainable conservation of the natural resources (Joshi, 2005). As improvement in the vegetation is one of the main concerns of any watershed development programme, this result proves that the importance given to this aspect was comparatively less.

With regard to the opinion of watershed staff on suitable extension methods (27 in numbers) for transfer of SWC technologies, analysis was carried out using effectiveness index and rank ordering method and the results are given in the Table 3 and 4.

Table 3. Opinion of watershed staff regarding the most suitable extension methods for transfer of SWC technologies

No.	Methods	Total Score	Effectiveness Index (%)*	Rank
1.	Group Meeting	66	91.67	1
2.	Study Tour	65	90.28	2
3.	Formation of Groups (SHGs & UGs)	60	83.33	3
4.	Farm and Home visit	59	81.94	4
5.	Result demonstration	58	80.56	5

Table 4. Opinion of watershed staff^{ff} regarding the least suitable extension methods for transfer of SWC technologies

No.	Methods	Total Score	Effectiveness Index (%)*	Rank
6	Farm publication	44	61.11	16
7	Campaign	44	61.11	16
8	Radio	43	59.72	17
9	Signing of MoU	43	59.72	17
10	Personal letter	42	58.33	18

Total score given to a particular method X 100

$$\text{*Effectiveness Index} = \frac{\text{Total score given to a particular method} \times 100}{\text{Total number of respondents (24)} \times \text{Maximum possible score (3)}}$$

The results show that Group Meeting (91.67%) ranks first among all the extension methods suitable for transferring SWC technologies to the farmers, followed by Study tour (90.28%), Formation of groups like SHGs and UGs (83.33%), Farm and Home visit (81.94%) and Result demonstration (80.56%). These results once again proved the significance of time tested methods like group meeting and study tour in imparting awareness and knowledge to the farmers. As per the famous quote "Seeing is believing", it is ensured from the results that methods like study tour and result demonstration were considered as most suitable approaches especially for programmes of watershed development. Similarly, personal interactions are also equally important in these activities, as it is revealed that formation of SHGs and UGs and farm and home visits were considered as two of the most suitable approaches.

On the other side, methods like personal letter and farm publication were not considered by them as much suitable for transfer of SWC technologies. The reason might be the demand of literacy knowledge among the stake holders in order to exercise this method, which is still a distant dream in many parts of rural Karnataka. The transfer of information through Radio has also lost its significance, owing to the probable reason that less interest among the farmers in listening to Radio. The campaign and signing of MoU were also not considered favorable by many of the staffs. This might be due to the reason that the former one was not much suitable, by its

very nature, for programmes like watershed development projects and the latter one was recently introduced in watershed programmes by few organizations like NABARD, and thus might not be known by much of the field staffs.

Further, the watershed staffs were also asked about the constraints faced by them in transfer of

Table 5: Major constraints faced by watershed staff

I. NGO	
1	Irregular release of fund
2	Insufficient staff
3	Making changes in guidelines affecting the process
4	Resistance from farmers for adopting new technologies
5	Caste and political dominance related issues
6	Cost involved for implementation of certain technologies in black soil is comparatively more than the normally prescribed
II. State department	
1	Irregular release of fund
2	Difficulty in convincing farmers to adopt new technologies
3	Difficulty in implementation through PRIs (Panchayat Raj Institutions)
4	Insufficient staff
5	Lack of adequate training
6	Encroachment of hills and nalas by farmers

technologies to the farmers. The results are presented in Table 5. Following are the recommended solutions with reference to above mentioned constraints.

Irregular release of fund

This is a policy related issue. The rules governing the watershed management fund generally prescribes the release of fund for any given year, only after the fund allotted for the previous year got spent. As both central and state governments are involved in these programmes, there were lots of complications built up in release of fund on time. A practical and transparent system of fund management shall be considered at the higher level in order to solve this problem.

Insufficient staff

This is again a policy related issue, as the authority to appoint qualified staffs in watershed departments, where there was always much demand for field work, lies entirely in the hands of concerned state governments. At present, the staffs are being deputed from Agriculture department to watershed department. In future, if the staffs were selected exclusively for watershed department, this constraint might get resolved.

Encroachment of hills and talas by farmers

This is also an issue concerning legal applications. So, the responsibility of solving this problem rests in the hands of state government.

Making changes in guidelines / Implementation through PRIs

The political dominance was mentioned as one of the main constraints hindering watershed development by many studies. NGO staffs suffer from improper selection of beneficiaries, lack of cooperation among fellow beneficiaries, and political intervention (Reddy *et al.*, 2001). This constraint became more severe once the amendments favorable to PRIs were introduced in the latest watershed guidelines. The recent amendment in Kariyali guidelines entrusted more power to the members of PRIs like gram panchayat president and secretary. This led to some unwanted complications like caste and political dominance of ruling party members in the activities of watershed development. The concepts of establishing Watershed Committees (WCs) and Watershed Associations (WAs), comprising the local villagers, were nowadays slowly waning away especially in the state government run watersheds. The NGOs and DWDO (District Watershed Development Officer) have so much say in this matter, especially with regard to monetary and decision making rights, which are almost vested with the members of PRIs. The Parthasarathy Committee suggests restoring the key role of WCs, by positioning them as one of the committees of the gram panchayat (Shah, 2006). If this suggestion were implemented, then this problem raised by the staff might get solved in future.

Resistance from farmers / Difficulty in convincing farmers to adopt new technologies

This is a common constraint mentioned by many staff quoting the reasons like high cost involved in implementation SWC technologies, lost of space in their

adoption etc. However, this constraint can be restricted to some extent by following some means as given below:

1. Arranging for more number of field visits and study tours for the farmers to the places where there are visible evidences of success stories. These trips might motivate them to go for SWC practices, though they are comparatively costlier.
2. Recommendation to adopt new technologies on a group mode by forming user groups or farmer field schools etc., would possibly reduce the burden borne by individual farmer and augment the confidence in their minds, which is normally absent when an individual adopt a new technology alone.

Cost involved for implementation

As the black soil in this region possess more clay content, naturally it poses some difficulty in implementing certain technologies like farm pond, trenches etc. So, cost involved in implementing these technologies in this region is more when compared to other regions. It is suggested to increase the prescribed cost parameters at least for these specific technologies, as the constraint is due to a natural phenomenon.

Lack of adequate training

The state department staffs are sent to their own training centres at Bijapur (for Northern Karnataka) or Mysore (for Southern Karnataka). This might result in learning of same technologies, which were taught to the staffs for long years. Rather, they should be encouraged to attend training programmes on recently developed, field tested and location specific technologies, which are adequately conducted in the research centres that are mentioned in this article. This does not mean that the state department training centres are not giving trainings on latest technologies. Instead it can be interpreted that exposure to new centres would certainly bring in some fresh approaches and methods in the thoughts and actions of the staff.

CONCLUSION

The study revealed about the accessible resource centres and their technologies for transferring to the fields in the selected watershed regions. It was also brought to notice that the watershed staffs were predominantly dependent on their own state government run resource centres rather than other national level centres. The knowledge of the staff was also found to be in the range of 40-70 percent. But this might not be taken as a factual

conclusion, as the real figures about their knowledge level with regard to implementation of those technologies could be obtained only by in depth study on the subject, which was not possible by the author due to various project oriented constraints. However, the results brought out a broad idea about the knowledge exposure of watershed staff to those technologies.

In case of opinion about the extension methods, they voted for visual oriented approaches like field visits, study tour, result demonstration and rapport building approaches like formation of groups and arranging meeting among those groups. Though these approaches are widely used in other development projects also, they could play a significant role in WSD programmes as warranted by the staff. On the other hand, approaches like farm publication and campaign could be reconsidered before recommending for transferring technologies in watershed projects, especially in this region of the country.

With regard to constraints faced by the watershed staff in transferring the technologies, some possible solutions are given in the previous section itself. As we have seen, solutions for some constraints rest purely in the hands of state government. But, many other can be solved at the field level itself or with the help of research centres located in that region. However, solutions like bringing farmer friendly amendments in the watershed guidelines are entirely rely on high level policy makers. So, it was hoped that the results obtained from this study would possibly give some clues to those policy makers for bringing out some practical oriented farmers centred decisions at the field level.

ACKNOWLEDGEMENT

The authors acknowledge Dr.P.K.Mishra, Head and all the scientists and technical staff of CSWCRTI,

Research Centre, Bellary, for their help and contribution in preparing the study questionnaire comprising the logical set of technologies. Acknowledgements are also due to all the scientists and staff of various research centres from which the technologies were collected and compiled.

REFERENCES

- Joshi, M.M. (2005). Technology refinement and adoption process in national watershed management project, In: *Watershed Management Challenges: Improving Productivity, Resources and Livelihoods*, Edited by Bharat R. Sharma, J.S. Samra, C.A. Scott and Suhas P. Wani, Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, Krishi Bhavan, New Delhi 110 001, India, pp:295.
- Joy K.J., Shah, Amita., Paranjape, Suhas., Badiger, Shrinivas., Lele, Sharachchandra. (2006). Issues in restructuring, *Economic and Political Weekly*, July 8-15, 2006, pp: 2994.
- Reddy, T.S.P., Daivadeenam, P., and Reddy, D.R. (2001). Governmental and non-governmental organizations' participation in watershed development programme - a constraint analysis, *Journal of Research*, ANGRAU, Hyderabad, 2001, 29: 2-3, pp:94-97.
- Shah, Mihir (2006). Towards reforms, overhauling watershed Programme, *Economic and Political Weekly*, July 8-15, 2006, pp: 2983.
- Sudan, F.K. (2002). NGO-government collaboration in Jammu and Kashmir: some preliminary observations, *Indian Journal of Social Development*, 2(2): 268-282.
- Vaidyanathan, A. (2006). Restructuring watershed development programmes, *Economic and Political Weekly*, July 8-15, 2006, pp: 2985.