Participatory Technology Development in Soil and Water Conservation for Watershed Development

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INTRODUCTION

Participatory Technology Development (PTD) in soil and water conservation for watershed development is a strategy or approach in which soil and water conservation technology can be developed with farmers on their farm, which are suitable to their particular watershed situation. The skill of local farmers is oriented to develop a SWC technology in their watershed catchment area with the help and under the guidance of outside subject matter specialists or extension personnel. PTD approach involves farmers' views from the beginning. The approach helps the farmers to help themselves for solving their problems in their watershed and increasing agricultural production. PTD approach helps to develop more cooperation and coordination among farmers, researchers and extension personnel.

Advantages

1. PTD helps the farmers to help themselves.
2. PTD develops trust among farmers, scientists and extension personnel.
3. It orients the farmers to solve their problems in their own way.
4. Other neighbouring farmers can easily adopt the technologies developed by PTD approach.
5. Farmers may have more faith and trust on the soil and water conservation technologies developed through PTD.

Disadvantages

1. Regularly and timely visits by the researchers and extension personnel for checking and guidance to farmers.
2. PTD takes long time to develop a technology.

STRATEGY FOR PARTICIPATORY TECHNOLOGY DEVELOPMENT

1. Information of watershed

The extension personnel should collect all the basic information about the adopted watershed. For this, the Participatory Rural Appraisal (PRA) technique can be used. The social and economic data of the watershed should also be collected. Different resources available and social status of the watershed farmers are the main assets for watershed development through PTD. A good soil and water conservation programme planning for watershed development depends on the collection of adequate and useful information. The extension worker and subject matter specialists must have information about availability of farm power *viz.*, implements, machines etc. in the watershed, which are helpful in soil and water conservation works. Through PRA technique, the extension personnel can obtain all possible information regarding population, number of families, number of farm families, transport facilities, resources, irrigation and drinking water facilities, implements and machinery in the watershed area. Extension personnel must also assess the attitude of the local people towards soil and water conservation for watershed

development. The favourable attitude will help in getting the people's participation in the planning, implementation and evaluation of soil and water conservation technology development through participatory approach for watershed development.

Action by: Extension personnel and farmers

2. Meetings with farmers of watershed

Several discussion meetings should be organized in between the extension personnel and the farmers in the watershed area to develop trust and relationship among them. In the meetings, more importance should be given to the target group farmers, whose fields are degraded and more affected by soil erosion in the watershed. The female farmers should also be motivated to take equal part in discussion meetings, so that their desires can also be addressed in the watershed development through PTD. It should also be taken care that all different categories of farmers living in the watershed area must participate in the meeting and have a healthy discussion about planning of PTD of soil and water conservation for sustainable agricultural production.

It is usually found that the young and middle age groups take up their parental occupation, and as a result, farming is taken over from the hands of old people. Old farmers being physically slow and weak may not be able to carry out different hard agricultural operations in the fields. Old farmers should preferably play a supporting role by imparting counseling based on their experiences. Hence, the middle and young age, male as well as female farmers should be given priority in such soil and water conservation programmes for watershed management. Young farmers should be contacted frequently to motivate them to participate in planning and execution of soil and water conservation works on their own land and on the land owned by their community. The young generation has the enthusiasm and modern approach to adopt new technologies, whereas the old generation farmers adhere to traditional practices.

It is also noted that the Sarpanchs or the Talatis of the villages give more concern to those government-sponsored programmes where free inputs and financial assistance is provided to the farmers. Their intention is to provide the free inputs to their acquaintances and relatives rather than the equal distribution of government aid among village people. Therefore, the PIA should directly contact or have meetings with farmers for development of all the farmers on watershed basis. The Sarpanchs or Talatis of the villages are not much interested to develop the poor people but they want to develop themselves by getting more and more free inputs and subsidies from the government.

It is understood that the farmers are not having much knowledge about soil and water conservation technologies for watershed development. In the group discussion meetings the awareness of local farmers about soil and water conservation technologies for watershed development should be increased. The increase in the knowledge of farmers regarding SWC technologies results in more positive attitude about watershed development programme, which leads to easy adoption of SWC technologies by the farmers for watershed development.

Action by: Extension personnel and farmers

3. Identification and prioritization of problems

Farmers as well as extension personnel would know the several problems prevailing in the watershed area after discussion in meetings. The problems prevailing in the watershed area should be listed out. Some problems seem to be more severe and some less, according to the watershed condition. Extension scientists with farmers' participation should do the prioritization of the problems and most severe problems of the farmers in the watershed area should be taken first for

watershed development through participatory technology development.

Action by: Extension personnel and farmers

4. Seeking solutions to problems

The most severe problems of the watershed should be discussed with farmers at watershed level as well as with investigating scientists at the research institute level by the extension personnel and solutions for these problems should be identified. If the research institute is already having solutions for the problems, then the problems should be eliminated with the available technologies by organizing the farmers' resources with required inputs from institute as assistance. It would help in testing the feasibility of the developed technology in the watershed farmers' situation. In case, the research institute is not having any technology to solve the existing problem in the watershed, the scientists in collaboration with farmers should plan a participatory research study for the watershed development. In the participatory technology development strategy farmers are involved at all the research stages at farmers' field in the adopted watershed.

Action by: Extension personnel, farmers and subject matter specialists

5. Planning participatory research

Bottom-up approach should be adopted in planning of PTD for soil and water conservation on watershed basis. It means that the soil and water conservation programme should be developed by the farmers, for the farmers and of the farmers. The PTD programme for SWC for watershed development should be need-based programme. The basic needs of the rural farmers' *viz.*, fuel, fodder and food should be taken care of through the planning of the SWC programme. It encourages favourable attitude of local farmers towards the SWC programme. People of villages should be motivated for participation in the SWC programme. They may be encouraged to contribute their own labour, money, implements and materials in construction of soil and water conservation structures during implementation stage of PTD programme.

Farmers have tendency to be more dependent on the government or project-implementing agency. Therefore, they should be taught to become self-reliant. They may receive guidance and technical assistance from government and project implementing agencies. The available resources with farmers should be contributed by the farmers in the PTD for their watershed development. It would be important to note that the PTD institute should supply those inputs required in the participatory technology development research study, which are not available with the beneficiary farmers for the development of adopted watershed by the institute. Emphasis should be given to develop participatory SWC technologies which require low cost or no cost to the farmers for watershed development, because most of the engineering SWC technologies require initial high cost for adoption and poor farmers are unable to adopt the costly technologies.

Action by: Extension personnel, farmers, subject matter specialists and Institute as aid of required inputs.

6. Plan of research

Prepare a plan of activities to be carried out regarding participatory technology development of SWC for watershed development. It is an important task that all the activities of the research study should be listed out on a paper and well explained in advance to the farmers, who would carry out the activities of the research studies in their fields on watershed basis. The plan of work should also indicate the time, date and work to be done by the farmers as well as extension personnel or researchers (subject matter specialists). It should be systematic and in easy format so that it can be easily understood by illiterate farmers.

Action by: Extension personnel, farmers and subject matter specialists

7. Implementation of participatory research

The success of any development project depends on its proper implementation. First of all, arrangements may be done to acquire all the required inputs such as equipments, machine, resources, etc. in time to implement the participatory research study for the watershed development. All steps to be carried out in the soil and water conservation technology development programme should be discussed with the farmers and their consent should be obtained at start of the development programme. It is important to explain to the farmers, through the subject matter specialists, all the steps of soil and water conservation research study for their proper execution. It will help the farmers to understand and carry out properly the implementation of soil and water conservation technology development process. At this stage, cooperation and coordination among farmers of the watershed and scientists of the research institute is very important for proper and timely implementation according to the plan of participatory research study. If required, a skill-oriented training may be imparted to male and female farmers at village level in advance to carry out or implement the research activities at farmers' fields in the watershed. Such activities will ensure the proper implementation of PTD research study.

Action by: Extension personnel, farmers and subject matter specialists

8. Monitoring of participatory research

In the implementation of PTD for SWC, monitoring at all the steps by the extension

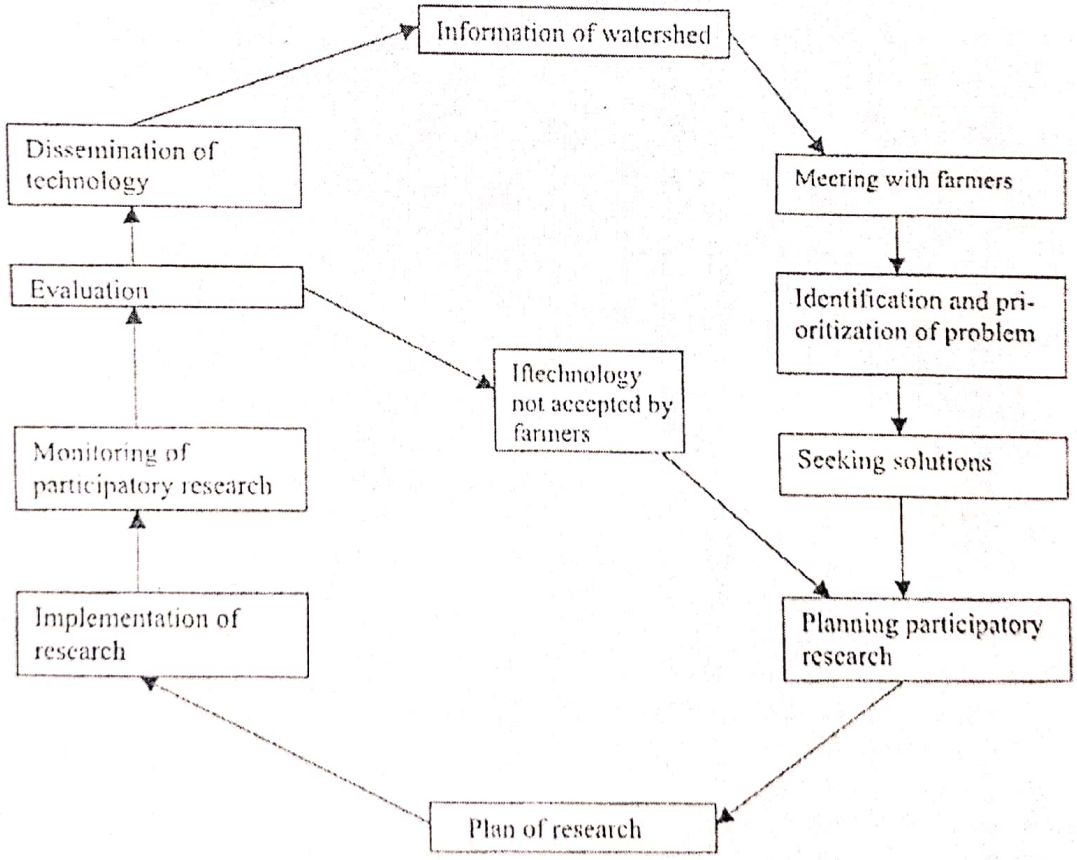

Fig. 1. Model of ten-point strategy of PTD

personnel and the subject matter specialists is imperative. The monitoring by the scientists is required to conduct the research in systematic way and according to plan till the new SWC technology is developed. The systematic and scientific implementation of SWC technology development at farmers' field would develop the faith of farmers in the actual results. It would also be helpful in easy dissemination of the developed technology from farmers to other farmers.

Action by: Extension personnel, farmers and subject matter specialists

9. Evaluation

The participatory technology developed should be evaluated by the subject matter specialists and extension scientists with the local farmers of the watershed to assess the usefulness and suitability of the technology for watershed development. The evaluation recommendations would be helpful in planning of future SWC participatory technology development for watershed development. Evaluation process is also an important step in comparing results of the SWC technology developed at research station and the SWC technology developed through PTD approach at farmers' fields in the watershed. If the results of the technology developed by PTD approach are not up to satisfaction of the farmers and outsiders, then the planning of participatory research in the watershed should be taken again with modifications after inclusion of evaluation recommendations. If the findings are good and up to the satisfaction of farmers and outsiders, then it should be adopted in the watershed for sustainable agricultural production.

Action by: Extension personnel, farmers and subject matter specialists

10. Dissemination of technology

The participatory technology, if developed with good results at farmers' fields in the watershed and accepted by the farmers as well as scientists, should be disseminated to the farmers in neighbouring areas. A result demonstration can be organized by the extension personnel to show and disseminate the participatory developed technology to other farmers.

Action by: Extension personnel and farmers