Inception Report on:
Validating Community-Based Water Resources Management Approaches for Hill and Mountain Ecosystems

Submitted to*:*

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1. **Project Background:** The project on **Validating Community-Based Water Resources Management Approaches for Hill and Mountain Ecosystems** is extension of the Pilot and Demonstration Activity on "Testing and Demonstration of Community-Based Water Resources Management Approaches for Hill and Mountain Ecosystems in Nepal" in Rasuwa and Nuwakot Districts of Nepal since 2009. The lessons learned from the first phase of project implementation clearly indicate that the demonstrations of IWRM approaches were found useful to poor and small farmers. These IWRM approaches are being proposed to implement in adjoining areas under a different irrigation system and different sub-watershed in phase second.
2. **Objective:** The broad objective of the PDA program is to enable demonstration and dissemination of proven ideas and innovative development approaches that are highly replicable and can strengthen ADB's core operations, including policy dialogue with government, reform agenda formulation, country programming, and project preparation and implementation. Thus, this is a project targeted for poverty reduction through better management of available water resources. The specific objective of this PDA is to:
    - demonstrate and disseminate various appropriate technologies to make the life easier and beneficial to the participating farmers (focus on demonstrating different techniques especially bioengineering along with small scale civil works for the slope stabilization of irrigation channels, test techniques and demonstration for soil conservation and improvement of soil fertility with reference to rational utilization of water and application of organic fertilizers and develop extension materials of verified technologies in the form of audio-visuals, books and booklets to be utilized in other areas of the country).
3. **Scope and Location of Work:** ECARDS-Nepal (Environment, Culture, Agriculture, Research and Development Society, Nepal) is a national NGO working in the field of research and development. It was founded in 1991 to foster sustainable community development through people's organizations and leadership. ECARDS-Nepal strives to serve as a vital link in the dynamic process of environmental management that helps to enhance and sustain agricultural productivity and natural resource management. It has a long experience on different fields of development, especially in social mobilization, agriculture, natural resource management and community development through skills development and their application for the beneficiaries of different parts of the country.

    In Nepal, majority of the Nepalese people are dependent upon natural resources for their livelihoods. Agriculture and forest are the integral part of farming systems. Rainfall is the main source of water in hill and mountain regions of Nepal and more than 80% of rainfall occurs in four months (June-Sept.) of monsoon season. Water scarcity is therefore a problem in most parts of hill and mountain regions of Nepal. Water is used for both productive and domestic purposes as well as meeting the need for biomass and contributes to rural livelihoods. Therefore, access to water for domestic and productive purposes is prerequisite for improving the livelihood of small scale farmers.

    Agriculture is the main source of livelihood of majority of people living in the hill and mid-hill regions of Nepal. Water is the main livelihood asset of these people and water scarcity is one of the main factors that limit their agricultural production, productivity, and

profitability. Soil erosion, soil degradation and declining soil fertility are also regarded as major problems in Nepal, threatening the sustainable use of sloping agriculture in the hills and mountains.

Gravity irrigation systems for surface irrigation are the predominant form of irrigation systems developed in the hills and mountains of Nepal. The irrigation systems developed are found less effective in ensuring the right to secure access to water for the poor, raising water productivity and supporting livelihood of all poor and deprived people. The ADB Project Completion Report of the Second Irrigation Sector Project (SISP) has pointed out that soil erosion and declining fertility were major problems, the project faced during implementation. Same technologies have been used to construct the irrigation systems in the plain and hill/mountain areas and the irrigation systems developed in the hill and mountain areas suffer more soil and water related problems.

The International Centre for Integrated Mountain Development's (ICIMOD), Godavari Demonstration Site and other organizations involving to address these issues have developed a number of technologies and practices that are useful for water management, soil erosion and landslides control as well as increasing soil fertility and water retention capacity and income generation activities.

The ADB funded Community Managed Irrigated Agriculture Sector Project (CMIASP), the successor project of the SISP implements farmer managed irrigation system improvements and micro irrigation. ADB supported PDA project entitled "Developing and Demonstrating Community-Based Water Resources Management Approaches for Hill and Mountain Ecosystems in Nepal" in the area of CMAISP (one Nuwakot, a hill district and the other Rasuwa, a mountain district) complimenting the irrigation with activities to improve sloping agriculture, watershed management, Multi Use Water System (MUWS) and soil stabilizing activities along the channel alignment has been completed.

Demonstration and dissemination of such techniques are very important as the soil and water resources in the mountainous and hill regions of the country are facing acute problem of landslides (slope stabilization) and the cultivated lands in these areas are prone to soil erosion, the fertility is depleting day by day. There is also high demand for the extension materials for dissemination among the water users community among the rural community. In this background, such activities will be incorporated in this proposal to be implemented in priority during Phase-II of the Project.

4. **Implementation Approach:** The project will be implemented jointly with Water Users' Association (WUAs) of selected irrigation systems from Rasuwa and Nuwakot districts. Efforts will be made to mobilize the WUAs for effective implementation of project activities. The project will be focused on demonstration and dissemination of approaches specific and appropriate to socio-economic and natural setting related to selected irrigation systems. Specific users' groups of the participating farmers will be formed and mobilized as per the need. Activity planning will be carried out in a participatory way. The planning activities will be performed at the field level. The members of the project team, expert's representative from DOI, DADO and other local institutions, members of WUAs and the beneficiaries will participate in the planning workshop.
5. **Activities / Actions to be implemented:** The following are the main activities to be launched for the successful implementation of this project using the most common participatory group formation and mobilization methods.

5.1 Organization of Inception Meeting: The project has been initiated from Jan. 2010 and started to implement after an inception meeting with Ms. Cindy Malvicini, Water Resources Management Specialist of ADB, Er. Naveen Man Joshi, Project Director of CMIASP, DOI, GoN, Dr. Jamshed Tirmizi, Team Leader of Community Irrigation Project ADB TA 7229 – Nep and Er. Jill Browning, Irrigation Engineer of Community Irrigation Project ADB TA 7229 – Nep in 04 Feb 2010 in ECARDs–Nepal Office, Kathmandu. All the suggestions and guidance made by the meeting are incorporated in the schedule for the implementation in phase second.

5.2 Social Mobilization Activities for IWRM: The project activities are being implemented jointly with Water Users'' Association (WUAs) of the selected irrigation systems. Efforts will be continued to mobilize the WUAs for effective implementation of project activities. It is focusing on demonstration and dissemination of approaches specific and appropriate to socio-economic and natural setting related to selected irrigation systems IWRM approaches having different socio-cultural and natural settings from the first phase. Activity specific users' groups of the participating farmers will be formed and mobilized as per the need. Two projects from Rasuwa and Nuwakot districts are identified. Project Orientation Meeting with district line agencies has been completed. Project Orientation Meeting with WUAs along with group formation and mobilization process is on-going.

5.3 Participatory Planning of Field Activities: Activity planning will be carried out in a participatory way. The planning activities will be performed at the field level. The members of the project team, experts, and representatives from DOI, DADO and other local institutions, members of WUAs and the beneficiaries will participate in the planning workshop. Field survey of the recommended/ selected channels (at least three channel systems) will be carried out starting from the source of water through the whole length of primary and secondary channels to the irrigation field. Both bird’s eye view techniques and walk over survey (transect walk) will be used for this purpose. It is required to make a sketch of the slopes affected by landslides and draw the main rock and soil type as well as the instability features. The features include location, extent of landslide debris, surface water drainage, topographical features like irregularities in topography, old landslides, hummocky slope and other signs of instability, all these observations are noted down with an appropriate number.

5.4 Conservation Activities: Natural resources conservation related demonstration and dissemination are very important for soil and water resources in the targeted districts. Following conservation activities will be implemented focusing on the acute problem of landslides (slope stabilization) and the cultivated lands in these areas are prone to soil erosion, the fertility is depleting day by day. Cost-benefit analysis on each technique to be tested will be completed with community, and strengths, weaknesses, opportunity and threats of different tested approaches will also be analysed from community using format attached in Table 2 and 3 respectively. Based on this periodic reports will be prepared drawing conclusions and making recommendations for scaling up techniques under different scenarios.

5.4.1 Slope stabilization of irrigation channels: Most of the irrigation systems in hills are not reliable due mainly to landslides along the channel alignment. They severely suffer from channel failures due to landslides and seepage. The problem of landslides and seepage will further aggravate the situation if proper investigation and timely and appropriate repair and maintenance techniques are not enforced. The seepage along the channels is also becoming a major landslide triggering agent in many areas. So, adequate knowledge and skills will be provided and the sense of environmental awareness created among the stakeholders of irrigation systems, especially the water users' groups, the life of channel as well as the environment along and around the channel could certainly be improved. Following main concerns will be discussed during the mobilization of WUAs**:**

- The vegetative cover hills along the channel length are destroyed because of the unavoidable hill cuttings along the inner bank and deposition of loose soil along the outer bank.
- The gentle slope along the outer bank of a channel provides better alternative for the people and their pets in steep hills. Thus, increased access accelerates the rate of denudation of vegetative cover around and along the channel length.
- Stability of hills along the channel length is altered during construction activities, which include excavation, blasting and felling trees.

5.4.2 Water Source Protection: The sources of drinking and productive water are generally small and degraded due to which the natural springs are getting drying and the watershed management activities will be continued in the targeted sites to protect their water sources and the new watershed management demonstration will be implemented as per the need.

5.4.3 Landslide treatment for irrigation channel: Channel stabilization in these regions has been severely affected by landslides and requires more resources for maintenance. The measure to be tested must be economic that can be affordable by the farmers with provision of utilization of local materials. Therefore, the low technology approach will be applied in this project. First, each existing slope failures along and around the irrigation channel will categorized whether it is in the form of rills and gullies from a unprotected surface, established gully, debris slide, shear failure or slumping, debris fall (collapse) and debris flow. Then appropriate technique to be applied will be selected in consultation with the landslide management expert. It might be small-scale civil construction work, bio-engineering or combination of both as per the need. The same techniques will be applied for the treatment of slope failure of similar type. Each of the techniques mentioned above will be considered as treatments and the number of sites applied with same techniques will be considered as the replication in testing such techniques.

5.4.4 Bio-engineering Initiative for Landslide Management (brush wood, gabion wall, dry stone wall, plantation.)**:** Bio-engineering alone and in combination with small

scale civil construction works is important both for prevention and rehabilitation of landslides. This technique is very economic for slope stabilization especially the scars, which are made during channel construction activities, and for the rehabilitation of landslides after the failure. Because the materials are locally available in the areas and skills can easily be transferred to the local people, especially to the members of water users' groups. There are different techniques of bio-engineering to be used depending upon the purpose such as catching, armouring, drainage, limiting, improvement accordingly plant species to be used to meet the purpose. An appropriate technique and plant species will be selected and implemented, accordingly.

5.4.5 Soil Conservation and Improvement of Soil Fertility: The high relief with slopes of different degree and the intense precipitation during monsoon season are responsible for excessive erosion in the project area. The specific sites for the application of mitigation measures will be identified (community plantation, pasture management, regeneration management) and then decisions will be taken which measures have to be applied, case by case.

5.4.6 On-farm Soil Conservation Practices in Sloping Land: Depletion of plant nutrients due to high surface erosion and soil degradation in sloping agriculture is the common problem in the hill and mountain regions of Nepal. On-farm soil conservation practices will be initiated to improve soil nutrient management practices, there by the productivity of agricultural land.

5.5 Training and Capacity Development: Following training events will be organized in order to capacitate the target beneficiaries of the project during the implementation period:

On-the-job bioengineering training: One of the main activities will be to conduct a non-formal, on-the-job training to farmers in landslide control using bioengineering and small-scale engineering techniques. For this purpose, about 20 participants will be selected and the training will be conducted in seven days. An important outcome of such a training and demonstration will be to make the participants able to identify various types of mass movements (instabilities) and their causes (i.e., land use, geology, soil type, water, weathering, jointing etc) as well as mechanisms (slide, flow, topple, fall, glide etc). Similarly, they will also learn to implement appropriate instability control measures. The training will help them to prepare cost-benefit analysis on each technique tested, and analyze the strengths and weaknesses of different tested approaches. The first two days will be devoted to the identification and study of typical instability problems (such as soil slides, rock slides, gully erosion, soil erosion, debris flow, mud flow etc) encountered on the slopes of project area. These two days will be required for giving the participants the theoretical basis of bioengineering and small-scale civil engineering. The remaining five days will be spent in on-the-job training to participants by implementing bioengineering and small-scale civil engineering structures on some specified sites along the canal alignment.

The training experts will also investigate in detail the instabilities on canal alignment and propose appropriate control measures. In this process, a few instabilities (or part of them) will be selected especially for training purpose where the participants will learn to implement bioengineering and small-scale civil engineering structures in the field during the remaining five days of on-the-job training. For the training purpose it will be required to prepare handouts by the training experts before the

implementation of the course. As the participants are not specialists as well as most of them can hardly read or write, the handouts will be prepared in three-dimensional block diagrams and explained thoroughly by the experts and discussed with the participants in the field.

During the preparation of the on-the-job training course, the training experts will select and investigate some typical examples (demonstration sites) of instabilities on nearby slopes (not necessarily the canal alignment). Based on the observations, they will prepare handouts necessary for the first two days of training course. Similarly, the training experts will also develop the methodological handouts for the remaining five-day long implementation training. All the capacity building bioengineering activities will be managed under the guidance of Prof. Dr. M. R. Dhital from Mountain Risk Engineering Department of TU.

5.5.1 Community Level Training: To enhance the capacity of the target beneficiaries, different training programmes will be organized at the community level. The duration and subject matter coverage of the training will vary based on the actual need of the beneficiaries. The major topics of the training will cover but not limited to the following group based training:

- Community Planning Training
- Social Mobilization Training
- Record Keeping and Group Management Training
- Community level review workshop once per three month per WUAs: Sharing workshop in concerned community level will be organized once per three months in order to share the findings of the project among them. Progress status of PDA, best practices, case studies, up scaling modalities will be shared in the community level.

5.5.2 Exposure Visit: A three day exposure visit will be organized to the management team of WUAs in order to observe and learn from the achievement of first phase.

5.5.3 Establishment of Nurseries: Apart from the aforementioned training, it will also be required to assess the stability of entire canal alignment and implement appropriate control measures. *A good nursery will be required to make available the necessary plants for implementing the training as well as canal stabilisation activities*. The nurseries will be established in each project sites to directly support the propagation of species used for the landslide control techniques above. Local genotypes will be selected from the local plants, best performing in the area. Scions of newly selected varieties will be obtained from District Soil Conservation Office. The nurseries will be sized as per demand of the area, but quality of the planting materials will have to be ensured as they are the base of the project.

5.5.4 National Level Sharing Workshop: A sharing workshop will be organized before finalization of the report. Since the intent of this PDA is to show how these techniques can be used in large-scale projects, the workshop will be organized with government and non-government stakeholders working in irrigation to discuss the findings and agree on how best to use them. The main purpose of the workshop is sharing the findings of the project among all stakeholders (Department of Irrigation, Soil Conservation, Roads and the Mountain Risk Engineering Unit of Tribhvuan University, Civil society and supporting agency) working in the sectors and further scaling up / extension of proven practices. Background paper including findings of

PDA, best practices, case studies, up scaling modalities will be shared in the workshop.

5.5.5 Activities for Documentation and Technology Dissemination of Proven Approaches: There is lack of appropriate materials useful for the soil and water conservation activities in the country. So, emphasis will be given to prepare following materials that will be useful not only in extension and technology transfer in the present project but also in similar situations in the country. The major activities will include:

- IEC Material Preparation and dissemination on IWRM technology
- Preparation and display of Audio-Visuals such as documentaries, photos
- Preparation and dissemination of pamphlets, posters
- Manuals and booklets on the proven technology of the project : A special bioengineering handbook **Information dissemination (Handbook)** for canal stabilisation will be prepared in Nepali based on this training course as well as the material available at the Department of Irrigation, Soil Conservation, Roads and the Mountain Risk Engineering Unit of Tribhvuan University. The experience gained from the success or failure of this activity can also be included in the handbook.

6. Implementation Schedule and Institutional Management Arrangements: ECARDS-Nepal will be responsible for overall implementation of the assignment. It will prepare the implementation directives for the assignment. Under direct supervision of the Executive Committee of ECARDS- Nepal, the Project Manager will be responsible for the actualization of the activities at all levels Strong coordination and linkage developed with ICIMOD, CMIASP and DOI in Phase 1 will be continued. In particular, coordination with ICIMOD is crucial in ensuring that the PDA will continue to benefit from ICIMOD's successfully established IWRM approaches in its Demonstration Farm in Godavari in the Kathmandu Valley. The activities implemented in these demonstration sites will be documented and can be scaled up, in similar areas under other projects. This project has been proposed for a total period of 12 months. The detailed implementation schedule is given in Chart 1.

Chart 1: Implementation Schedule

S.N.	Activity / Action	Unit	Quantity	Months of the year 2010											
				J	F	M	A	*M*	J	J	A	S	O	N	D
I	**Social Mobilization Activities for IWRM**														
1.1	Project identification and site selection	Event	2												
1.2	Project Orientation meeting with district line agencies	Time	1												
1.3	Project Orientation meeting WUAs	Time	2												
1.4	Users group formation and mobilization	No	10												

II	**Participatory Planning of Field Activities**															
2.1	Inception meeting with support and partner agency	No	1													
2.2	Planning meeting with district line agency	No	2													
2.3	Transect walk of channel	No	2													
2.4	Community discussion	No	2													
2.5	Action Plan preparation	No	2													
III	**Project Activities**															
3.1	Slope stabilization of irrigation channels	No	2													
3.2	Water Source Protection	No	2													
3.3	Landslide treatment for irrigation channel	Event	2													
3.4	Bio engineering Initiative for landslide management (brush wood, gabion wall, dry stone wall, plantation.)	Event	4													
3.5	Soil conservation and improvement activities(community plantation, pasture management, regeneration management)	Event	5													
3.6	On-farm soil conservation practices in sloping land (SALT)	Event	4													
VI	**Training and Capacity Development**															
4.1	On-the-job bioengineering training for WUAs	Event	2													
	Community Level Training															
	Community Planning Training	Event	10													
	Social Mobilization Training	Event	10													
	Record Keeping and Group Management Training	Event	10													
4.2	Community level review workshop once per three month per WUAs	Event	8													
4.3	Exposure Visit	Event	1													

4.4	Establishment of Nurseries	No	1												
4.5	National Level Sharing Workshop	Time	1												
	Documentation														
	IEC Material preparation and dissemination on IWRM technology	LS	1												
	Preparation and display of Audio-Visuals	Event	1												
4.6	Manuals on bioengineering handbook.	Event	1												
V	**Monitoring**														
5.1	Project staff monthly planning and review meeting	Time	12												
5.2	Project site visit for backstopping by expert	PM	10												
VI	**Reporting**														
6.1	Inception	Event	1												
6.2	Mid-term	Event	1												
6.3	Final	Event	1												
VII	**Project preparation and submission for up scaling**														

7. Mobilization of Human Resource: ECARDS-Nepal will depute an experienced team as well as local people / community facilitators. The position, qualification and assigned duties of the proposed human resources are given in Table- 1.

Table-1: Description of Human Resources

SN	Proposed Position / Expert	Qualification and experiences	Assigned *duties*	Input, Month	
				F	O
1	Team Leader (TL): Mr. G.S. Awasthi	Master in Agr with more than 20 years work experience in project management	Overall management responsibility of the project. Coordination with line agency, program planning and implementation, supervision of field work, reporting to funding agency. 10 % involvement in the project	2.0	2.0
2	Project Implementation Consultant: Mr. R. P. Devkota	Master in Agr with more than 35 years work experience in Project Management. Several years working experience in ADB funded project	Part time involvement in the implementation of the project. Coordination with district and other level line agencies, program planning of field work and reporting to Team Leader.	0.75	0.25

3	Bioengineer Consultant: Prof / Dr. Megh R Dhital Dr. Jagannath Joshi	Both are PhD in Bioengineering with more than 25 years work experience	Part time involvement in planning and implementation of bioengineering activities. Reporting to team leader.	0.75	0. 25
4	Irrigation Engineering Consultant: Mr. R. P. Upadhyaya	Degree in civil engineering with more than 25 years work experience including UNDP	Part time involvement in planning and implementation of engineering activities. Reporting to team leader.	0.5	0
5	Social Mobilization Consultant: Mr. Gopal Ghimire	Master in Mgnt with more than 10 years work experience	Part time involvement in planning and implementation of social mobilization activities. Reporting to team leader.	1.3	0.3
6	Agriculturist Dr. C. Regmi	PhD in Agr with more than 25 years work experience	Part time involvement in planning and implementation of agriculture activities. Reporting to team leader.	0.5	0. 5
7	Field Coordinator / Forester (FC); Mr. Puran Bd Ayer	B Sc in Forestry or NRM with minimum a year work experience	Overall implementation of the project activities at field level. Coordination with district and other level line agency, assisting PM and other experts in program planning and implementation, supervision of field work, reporting to PM.	10	1
8	Agriculture Technician / Social Mobilizer: Mr. Ishwari Kafle Mr. Ram Kumar Rai	At least JTA with 3 year work experience in Related Activities.	Overall responsible for social mobilization and agricultural extension activities and backstopping them to the farming communities. Reporting to FC	20	0
9	Admin & Finance Assistant	At least I. Com with 3 year work experience in Admin & Finance.	Overall responsible for Project Related Admin and Finance Activities.	0	3

Executive committee of ECARDS-Nepal will provide overall guidance to the project team from the centre as well as at the field level as the case may be. The Project Team Leader will be responsible for overall management of the assignment. Other members of the project team will be recruited based on their experiences of handling similar projects.

8. **Monitoring, Supervision and Reporting:** ECARDS-Nepal will adopt the participatory and self-monitoring during planning, implementation and monitoring and evaluation of the project for efficient and effective performance of the project. The detailed work-plan will be finalized at the beginning of the project that sets out specific activities, a timeline for completing the activities, and milestones for outputs to be achieved. The personnel

policy of ECARDS-Nepal is to have each staff prepare and get approval for a monthly work plan to guide the activities of each month and submit the activities performed in each month. The Project Manager / Team Leader along with his team will be responsible to monitor and maintain progress. ECARDS-Nepal management team and the team of the experts will also be involved in monitoring and supervision of field activities. Public audit will be one of the transparency tools in the monitoring and evaluation of the purposed program. Apart from the above, ECARDS-Nepal will prepare and submit the following reports;

- Inception Report,
- Mid-term Report,
- Project Completion Report

The activities implemented in these demonstration sites will be documented and can be up scaled in similar areas under other projects. However, the specific results will be:

Outputs: Followings will be the outputs of the project

- Replicable approaches for landslips and channel stabilization along the irrigation channel for hill and mountain ecosystems developed.
- Educational materials of best practices for introducing land slide management and water harvesting, storage, and micro irrigation for market based crops developed
- Video on best practices produced.

Outcomes: The expected main outcome/result will be that bioengineering methods are adopted country-wide through large-scale irrigation programs. However, the followings will be other expected outcomes:

- Integrated water resources management approaches focusing on domestic and productive use of water promoted
- Landslides situation in the area decreased & soil fertility status of the area improved.
- Increased sustainable production and annual sales of high-value vegetables and NTFPs
- Enhanced capacity of community people for integrated water resources management and livelihood improvement.
- Cost-benefit analysis on each technique tested, and analyzes the strengths and weaknesses of different tested approaches.
- Prepared a report drawing conclusions and making recommendations for scaling up techniques under different scenarios.

Table- 2: Cost-benefit analysis on each technique to be tested

S.N.	Major activity / action	Unit	Quantity	Cost Component							Benefit Component				
				HR, HRD			Material			Total	On farm				Off farm: NTFP
				Unskilled	Skill	Total	Local	Outside	Total		Area, ha	Production	Rate, NRs	Return	
1	Slope stabilization of irrigation channels	No	2												
2	Water Source Protection	No	2												
3	Landslide treatment for irrigation channel	Event	2												
4	Bio engineering Initiative for landslide management (brush wood, gabion wall, dry stone wall, plantation.)	Event	4												
5	Soil conservation and improvement activities(community plantation, pasture management, regeneration management)	Event	5												
6	On-farm soil conservation practices in sloping land (SALT)	Event	4												
7	On-the-job bioengineering training for WUAs	Event	2												
8	Community Level Training														

9	Community Planning Training	Event	10													
10	Social Mobilization Training	Event	10													
11	Record Keeping and Group Management Training	Event	10													
12	Community level review workshop once per three month per WUAs	Event	8													
13	Exposure Visit	Event	1													
14	Establishment of Nurseries	No	1													
15	National Level Sharing Workshop	Time	1													
16	IEC Material preparation and dissemination on IWRM technology	LS	1													
17	Preparation and display of Audio-Visuals	Event	1													
18	Manuals on bioengineering handbook.	Event	1													

Table- 3: Participatory SWOT analysis of different tested approaches

S.N.	Major activity / action	Unit	No	Places	SWOT Analysis of the activity				Up scaling modality
					Strength	Weakness	Opportunity	Threat	
1	Slope stabilization of irrigation channels	No	2						
2	Water Source Protection	No	2						
3	Landslide treatment for irrigation channel	Event	2						
4	Bio engineering Initiative for landslide management (brush wood, gabion wall, dry stone wall, plantation.)	Event	4						
5	Soil conservation and improvement activities(community plantation, pasture management, regeneration management)	Event	5						
6	On-farm soil conservation practices in sloping land (SALT)	Event	4						
7	On-the-job bioengineering training for WUAs	Event	2						
8	Community Level Training								
9	Community Planning Training	Event	10						
10	Social Mobilization Training	Event	10						
11	Record Keeping and Group Management Training	Event	10						
12	Community level review workshop once per three month per WUAs	Event	8						
13	Exposure Visit	Event	1						

14	Establishment of Nurseries	No	1						
15	National Level Sharing Workshop	Time	1						
16	IEC Material preparation and dissemination on IWRM technology	LS	1						
17	Preparation and display of Audio-Visuals	Event	1						
18	Manuals on bioengineering handbook.	Event	1						