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**Training programme
on**

***Training Master of Trainers on Planning and Management of
Integrated Watershed Management Projects (IWMP)***

Reading Material



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PART – I

1. CHANGING PARADIGMS AND COMMON GUIDELINES OF WATERSHED MANAGEMENT PROGRAMME

Introduction

Rainfed agriculture is considered as a gamble with monsoon while soils are not only thirsty but also hungry. With irrigated areas showing slow down of green revolution gains, rainfed areas are considered the hope of future food, fodder and nutritional security. Globally watershed management has been accepted as a means of efficient use of natural resources and environmental protection. Watershed management is all the more important in less endowed fragile ecosystems of arid and semi-arid rainfed regions of India to conserve the already degraded and limiting natural resources namely soil, water, vegetation, etc. and to maintain productivity.

With about 68 percent of rural population (Kumar et al., 2009), rainfed areas. In rainfed regions, the annual precipitation is lower than the evapo-transpiration demand particularly in arid and dry semi-arid zones. Rainfed areas contribute about 40% to National food basket; covering most of the area under coarse cereals (85%), pulses (83%), oilseeds (70%), cotton (65%) and even rice (42%).

Given the magnitude Watershed programmes have been in operation for a long time mainly as a soil and water conservation programme. In 1980s, ICAR launched National Model watershed Programme considering watershed as growth engine for enhancing productivity in rainfed areas. The watershed approach was up-scaled under the aegis of National Watershed Development Programme for Rainfed Areas (NWDPPRA) by Ministry of Agriculture, GoI and in on-going programmes of participatory watershed management programme under DPAP, DDP and IWDP by Ministry of Rural Development, GOI and by converging all these watershed programmes into a single window programme i.e Integrated Watershed Management programme (IWMP) 2008.

In the early stages, the major focus of “Watershed Management” was on soil and moisture conservation and water resource development. However, it was felt that there must be matching production oriented activities along with soil and water conservation so as to make



productive/economic use of the enhanced soil moisture regime and water resources created in a watershed, particularly in dry land areas, for the benefit of farming community. Therefore, crop improvement programmes and alternate land use systems were brought in as components of watershed management. In order to impart stability to the income of dry land farmers in such situations, livestock management particularly small ruminants, poultry, piggery etc., which are suited to dry land environment become integral part of watershed management.

A Watershed is a hydro-geological unit draining to a common outlet point in a drainage system and may have different land uses (arable/non-arable/forest etc.) belonging to private or common property resources within it. The main principles of watershed management are:

- i. Land treatment from ridge to valley
- ii. Utilizing the land according to its capability
- iii. Promoting vegetative cover on the soil
- iv. Enhancing rainwater productivity through:
 - Conserving as much rainwater as possible at the place where it falls – in situ conservation
 - Draining out excess water safely and harvesting in ponds for recycling – ex situ conservation
 - Drainage line treatment for control of soil erosion and recharge of ground water
- v. Increasing cropping intensity through intercropping and sequence cropping
- vi. Diversification of land use and safe utilization of marginal lands through alternate land use systems.
- vii. Promoting integrated farming systems (IFS) approach for ensuring sustainability of the ecosystem.
- viii. Stabilizing total income and cut-down risks during aberrant weather situations through contingent crop planning and weather-based insurance
- ix. Improving infrastructural facilities with regard to value addition, storage, transportation and marketing.

1.2 Changing Paradigms

Past couple of decades has seen paradigm shifts in the focus of community participation. The planning has to be done with a 'bottom-up' approach as compared to 'top-down' approach practiced in the past, to ensure people's participation in planning, implementation and maintenance of assets created under the programme. There is considerable emphasis on social and gender equity and inclusive growth so that the needs of the farm women and asset or land less people in the watershed are taken care of. There also need for better financial management; budget provided are used for the purpose for which it is allocated and it is spent with prudence and transparency. The common guidelines-2008 later revised during 2011 provide insights on all these aspects including dedicated institutions at National, State, district and village level for enhancing the effectiveness of the watershed programme and fund flows have been streamlined accordingly. In short, the approach and strategies of watershed development moved from 'technical' to 'socio-technical' over time and may be summarized as follows;

- Approach shifted from “soil conservation” to “participatory watershed management” supporting the entire livelihood system of the local people.
- “Line department” and “top – down” oriented planning replaced with “participatory watershed development” following “bottom-up” approach- empowerment of community and stakeholders.
- Project funding mode shifted from solely “government grant” to “government grant-cum-users contribution” mode.
- New institutional mechanism for implementing watershed programme with PRIs/ NGOs as implementing agencies and facilitation by line department.
- Social auditing of the watershed programmes ensuring transparency at all levels.
- Targeting benefits of the programme especially to resource poor people and women groups.
- The guidelines changed form generalities to specifics to meet the changing needs over time and space.

Watershed programmes are crucial in the context of changing climatic scenario for mitigation and adaptation to make agriculture resilient. Integration of livestock, particularly small ruminants, poultry and fishery in watershed programmes impart resilience to agriculture against weather aberrations in rainfed areas. Watershed management has to



address the emerging scenarios like reduced water availability for agriculture due to competing demands from other sectors besides ground water depletion. There is growing emphasis on 'water productivity' implying higher economic returns from unit of water. Rainwater harvesting and growing of high value crops together with water saving technologies such as micro-irrigation systems are being promoted in watersheds for enhancing water productivity. Suitable farm mechanization can also help in productivity enhancement and cost reduction through efficient and timely operations. Thus, the broad objectives of watershed management given below:

- Harvesting maximum possible rainwater for the purpose of supplemental and come up irrigation, drinking water availability, plantation including horticulture and floriculture, pasture development, fisheries, etc. to create sustainable sources of income for the village community. This leads to conservation, development, and sustainable management of natural resources including their use.
- Ensure overall development of rural areas through employment generation, poverty alleviation, community empowerment, and development of human and other economic resources.
- Mitigating the adverse effects of extreme climatic conditions such as droughts and flood on crops, human and livestock population.
- Restoring ecological balance by harnessing, conserving and developing natural resources namely land, water and vegetative cover especially plantations.
- Encouraging user groups towards sustained community action for the operation and maintenance of assets created and further development of potential of the natural resources in the watershed.
- Promoting use of simple, easy and affordable technological solutions and institutional arrangements that make use of, and build upon indigenous Technical Knowledge (ITK) and available materials.
- Enhancing agricultural productivity and production in a sustainable manure
- Reduction in regional disparity between irrigated and rainfed areas.

1.3 Key Features of Common Guidelines – 2008

Delegating powers to the states, dedicated institutions for managing the watershed programmes, providing financial assistance to the dedicated institutions, flexibility in the duration for the programme from 4 years to 7 years, focus on livelihood orientation, cluster



approach i.e., geo-hydrological units varying from 1000-5000 hectares comprising of clusters of micro watersheds, scientific planning, capacity building of all functionaries and stake holders involved in the watershed programme and a multitier (ridge to valley) approach are the key features of the common guidelines – 2008.

The institutional arrangements for effective and professional management of watershed development projects at various levels include

- National Rainfed Area Authority –the apex body at the national level (Department of Land Resources under Ministry of Rural Development will oversee the functions at national level)
- State level nodal agency (SLNA – will sanction watershed projects for the state on the basis of approved state perspective and strategic plan as per procedure in vogue and oversee all watershed projects for the state within the parameters set out in the guidelines):
- Watershed Cell cum Data Centre (WCDC) at the district level with specific role of Panchayat Raj institutions (PRIs) at district and intermediate levels. The institutional arrangements at project level include
- Project implementing Agency (PIA – may include relevant line departments, autonomous organizations under state/central governments, government institutes./research bodies, panchayats, voluntary organizations) and ii). Watershed Development Team (WDT).
- The institutions at the village level for people’s participants include
 - i). Self Held groups (SHGs),
 - ii). User groups (UGs) and
 - iii). Watershed Committee (WC).

For the roles and responsibilities of various institutions and other details, the common Guidelines for Watershed Development Projects, Govt. of India – 2008 refer (www.dolr.nic.in/commonguidelines-2008.pdf).

1.3.1 Guiding Principles

Following are the guiding principles of the common guidelines – 2008

1. Equity and gender sensitivity
2. Decentralization
3. Facilitating agencies

4. Centrality of community participation
5. Capacity building and technology inputs
6. Monitoring, evaluation and learning
7. Organizational restructuring

1.3.2 Project Management

The major activities of watershed development projects will be sequenced into

1. Preparatory Phase (<1 year),
2. Watershed Works Phase (3 to 5 years) and
3. Consolidation and Withdrawal Phase (<1 year)

The major objective of the preparatory phase is to build appropriate mechanisms for adoption of participatory approach and empowerment of local institutions (WC, SHG & UG). WDT will assume a facilitating role during this phase. The preparation for DPR (detailed project report) is done in the preparatory phase including activities to be carried out, selection of beneficiaries and work sites, design and costing of all works ensuring that the interest, perceptions and priorities of women, Dalits, Adivasis and the landless are adequately reflected in the DPR. Working out detailed resource-use agreements for surface water, ground water and common/forest land usufructs among user group members in a participatory manner based on principles of equity and sustainability is also done before hand in preparatory phase itself. Watershed works phase is the heart of the programme in which the DPR will be implemented. In the consolidation and withdrawal phase, the resource augmented and economic plans developed in phase II are made the foundation to create new natural resource based, sustainable livelihoods and raise productivity levels.

1.3.3 Implementation of Watershed Works

Some of the important activities (works) of Watershed Development Projects are:

- a). Ridge area treatment: All activities required to restore the health of the catchment area by reducing the volume and velocity of surface runoff, including regeneration of vegetative cover in forest and common land, afforestation, staggered trenching, contour and graded bunding, bench terracing etc.



- b). Drainage line treatment with a combination of vegetative and engineering structure such as earthen checks, brush wood checks, gully plugs, loose boulder checks, gabion structures, underground dykes, etc.
- c). Development of water harvesting structures such as low-cost farm ponds, nanal bunds, check-dams, percolation tanks and ground water recharge through defunct wells.
- d). Nursery raising for fodder, fuel, timber and horticultural species. As far as possible local species may be given priority.
- e). Land development including in-situ soil and moisture conservation and drainage management measures like field bunds, contour and graded bunds fortified with plantation bench terracing in hilly terrain, etc.
- f). Crop demonstrations for popularizing new corps/varieties, water saving technologies such as drip irrigation or innovative management practices.
- g). Pasture development, sericulture, bee-keeping, backyard poultry, small ruminants, other livestock and micro-enterprises.
- h). Veterinary services for livestock and breed improvement measures.
- i). Fisheries development in village ponds/tanks, farm ponds, etc.
- j). Promotion and propagation of non-conventional energy saving devices, energy conservation measures, bio-fuel plantations, etc.

1.3.4 Budgetary Provision

The distribution of budget for specific watershed projects for the various components therein is given below:

Budget Component		Percent of the budget
	Administrative costs	10
	Monitoring	1
	Evaluation	1
Preparatory Phase	Entry points activities	
	Institution and capacity building	4
	Detailed project report (DPR)	5
		1
Watershed Works phase	Watershed development works	
	Livelihood activities for asset less persons	56
	Production system and micro-enterprises	9
		10
Consolidation phase		3

Total	100
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1.3.5 Technology Inputs

Technology enables, inter-alia, to strengthen programme management and coordination, undertake activity based project planning, formulate action plans, streamline sanctions and release of funds, create usefull data bases, assess actual impacts of projects, make effective prioritizations, prepare sophisticated DPRs, documents best practices and case studies and facilitate the free and seamless flow of information data.

Remote sensing data would be utilized for finalizing contour maps for assessment of runoff and for identifying structures best suited for location of projects. This would result in cost and time optimization in project implementation. Technology would also contribute immensely in assessing the actual impact of various programmes in a given area. Due to availability of latest remote sensing techniques, it is now possible to assess periodic changes in geo-hydrological potential, soil and crop cover, runoff etc., in the project area.

1.3.6 Allocation of Funds, Approval of Projects and Release of Funds

By the end of February each year, the states will submit detailed annual action plans indicating on going liabilities as well as new projects which they wish to take up. The departmental nodal agency at central level will thereafter, based on total available budget for the year and other criteria, allocate specific amounts for individual sates from whom proposals have been received. The central share of funds shall be released to the SLNAs for the three phases of the implementation spread over the project period as per the guidelines. The project funds relating to watershed works, livelihood and production system and micro-enterprises may flow from Department of Land Resources (DoLR) to SLNA to WCDC to WC. Administrative cost, capacity building, entry point activities, DPR, monitoring component of project funds may flwo form DoLR to SLNA to WCDC to PIA.

1.3.7 Watershed Development Fund

One of the mandatory conditions for selection of villages for watershed projects is people's contribution towards the watershed development fund (WDF). The contributions to WDP shall be a minimum 10 percent of the cost of NRM works executed on private lands only.



However, in case of SC/ST, small and marginal farmers, the minimum contribution shall be 5 percent of the cost of NRM works executed on their land. For other cost intensive farming system based livelihood activities/interventions such as aqua culture, horticulture, agro forestry, animal husbandry, etc., on private land directly benefiting the individual farmers, the contribution of farmers will be 20 percent for general category and 10 percent for SC and ST beneficiaries with a maximum limit of double the unit cost of the project for watershed development (Rs.12,000/15,000 per ha as the case may be). The farmers' contribution will go to WDF.

1.3.8 Convergence with other Schemes/Projects

All efforts must be made to converge and harmonize resources of different schemes and programmes by different line departments/agencies operating in the area. The DPR may elaborate gaps to be filled for watershed activities to be taken up under these programmes such as, Backward Regions Grant Fund (BRGF), Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), and other related schemes of Ministry of Agriculture (like RKVY, NFSM, NHM, ISOPOM, etc.) Ministry of Water Resource, Ministry of Environment and Forest, etc. marketing and value addition is also possible under revised APMC Act.

1.3.9 Capacity Building

Capacity building support is a crucial component to achieve the desired results from watershed development projects. Reputed national and state level organizations including voluntary organizations could impart capacity building inputs to stakeholders of various levels.

1.3.10 Monitoring, Evaluation and Learning

Regular monitoring of the project will have to be carried out at each stage. Each evaluation will include physical, financial and social audit of the work done. Systematic efforts are to be made by the WDT/WC to learn from the field experiences as also form feedback of independent sources. Each watershed development project is expected to achieve the following results by the end of the project period.



- i). All the works/activities that are planned for the treatment and development of drainage lines, arable and non-arable land in the watershed area completed with the active participation and contribution of the user groups and community at large.
- ii). The UGs/Panchayats have willingly taken over the operation and maintenance of the assets created and made suitable administrative and financial arrangements for their maintenance and further development.
- iii). All the members of WC and staff such as watershed secretary and volunteers have given orientation and training to improve their knowledge and upgrade technical/management and community organizational skills to a level that is appropriate for the successful discharge of their responsibilities on withdrawal of the WDT of the project.
- iv). The village community would have been organized into several homogeneous SHGs for savings and other income generation activities which would have achieved sufficient commitment from their members and built up financial resources to be self sustaining.
- v). the increase in cropping intensity and agricultural productivity reflecting in overall increase in agricultural production
- vi). Increase in income of farmers/landless labourers in the project area.
- vii). Increase in groundwater table due to enhanced recharge by watershed interventions.

2. PHASES OF INTEGRATED WATERSHED MANAGEMENT PROGRAMME

I. Preparatory phase

Orientation of community about approach & strategy under watershed programme

- Participatory approach during all stages
- Peoples contribution for each component
- Allocation of funds for different activities
- Equity consideration for poor and women

II. Planning Phase

1. Demarcation of watershed boundary
 - Through the use of topo-sheet
 - Through joint field visit
2. Survey of different resources
 - Private land resources
 - Water resources
 - Common land resources
3. Organization of user groups for different resources
4. Analysis of problems and constraints
5. Analysis of appropriate technological options
 - Analysis of indigenous innovations/initiatives/ideas
 - Sharing of exogenous technological options
 - Ranking of different technological options by user groups
6. Preparation of detailed action plan
 - Collection and consolidation of proposals
 - Facilitation of group action / conflict resolution
 - Assessment of budget requirement
7. Organization of watershed association / committee
8. Technical approval action plan by WA

III. Implementation Phase

1. Orientation of community about operational modalities of various works
 - Collection of contribution
 - Starting implementation process
 - Maintenance of Physical and Financial records
 - Payment for completed works
2. Orientation of honorary office bearers of WA/WC regarding their role and responsibilities during implementation phase.
3. Training of office bearers of watershed committee
4. Concurrent planning of leftover works during implementation phase

IV. Monitoring and Evaluation Phase

1. Assessment of performance of technological – interventions by users' themselves
2. Periodic review and monitoring by funding agency
3. Annual auditing by designated chartered accountant
4. Social auditing and transparency in transactions
5. Mid-term evaluation of project by funding agency
6. Mid-term evaluation of project by PIA

Mechanisms

Some of the important mechanisms used under the project for promoting participatory approach are indicated below.

- a. Social mechanisms:
 - Commitment from community before finalization of village
 - Timely orientation of various stake holders regarding participatory approach
 - Organization of community into a new institutional set up at the village level
 - Social auditing and transparency in different transactions
 - Capacity building of stake holders on not only technological aspects but also managerial as well as social aspects
- b. Technological mechanisms
 - Building upon indigenous innovations, initiatives and ideas
 - Replication of success stories irrespective of source of innovation
- c. Financial mechanisms



- Direct funding of development component to the community
- Contributory approach for developmental works
- d. Managerial mechanisms
 - Demand driven approach for preparation of action plan
 - Application of PRA tools and techniques in the context of watershed programme
 - Decentralization regarding technical sanction of action plan at watershed level
 - Elimination of contractor ship for implementation of works
 - Concurrent evaluation of the programme for modification of action plan during implementation phase

3. PARTICIPATORY MANAGEMENT OF MANCHAL WATERSHED; SUCCESSES AND FAILURES – OVERALL CONSOLIDATION OF LEARNINGS - (PROJECT PERIOD 1995-2001)

Based on the recommendations of Sri. Ch. Hanumanta Rao Committee in 1994 and also keeping in view the lessons learnt from available field experiences, a comprehensive guideline was evolved by MORD, Govt. of India for large scale facilitation of participatory approach in watershed programme. Important mechanisms and pre-requisites which facilitated people's participation in different success stories were synthesized in the guidelines along with detailed operational modalities without sacrificing flexibility in decision making process at different levels.

MANAGE has also been associated in the formulation of above guidelines. Afterwards it has produced operational manual, technical manual as well as trainer's manual to assist in implementation of above programme. At that stage, MANAGE also took interest in testing above guidelines as well as manuals by becoming a Project Implementation Agency (PIA) in Manchal Watershed under Ranga reddy district of Andhra Pradesh. The above project is managed at the district level by Project Director, Drought Prone Area Programme (DPAP). One of the main purpose of taking up the above initiative was to carry out development oriented action research on participatory approach so that it may benefit the host institution (MANAGE) in building its own capacity and to generate a working experience on above aspects for future guidance of those who are directly involved in this programme at different levels during 1995-2001.

Basic information about the project

Manchal watershed is located in Ranga Reddy district at a distance of about 60 km from Hyderabad. The above project consists of 9 micro-watersheds (500 ha each watershed) spread over in 6 villages. Soils of this area are predominantly red, having shallow depth (15-45 cm.) and low moisture holding capacity. Topography is undulating with an average slope of about 3.0 percent. Rocky outcrops are commonly observed in this area.

The watershed receives an average of 700 mm rainfall per annum. More than 80 percent of it is received during June to September. On an average 2 to 3 rounds of intensive rains are

received every year due to cyclonic depression in Bay of Bengal. These rains produce significant runoff, which was collected in a series of tanks. Sorghum and castor are major crops under rainfed condition, where as paddy is the main crop under irrigated condition. The above project has provided a sound working experience on participatory management of watershed programme. Some of the experiences were successful while others were unsuccessful; nevertheless both have added to the learning process in a significant manner. A consolidated picture on above aspects is indicated below.

Strong points

(i) Facilitation of contributory approach in a genuine manner:

By and large contribution under the project was paid by actual beneficiaries. Main factors which helped in receiving genuine contribution from actual users are as follows.

- Commitment from community to adopt contributory approach before finalization of village under the project.
- Demand driven approach in preparation of action plan.
- Collection of contribution in advance (before starting implementation of works)
- Payment to labourers and other service providers through cheques (particularly if amount was high)
- Collection of higher rate of contribution for those indigenous technologies about which farmers were convinced but WDT were unaware.
- Implementation of works as and when people got motivated to pay contribution (even if it resulted into scattered development in early stages).
- Complete elimination of contractor ship for implementation of works (so that due amount was paid to each service provider as per SSR).
- Attempt towards simplification of technical estimates (of costly structures) into user-friendly estimates and sharing it with different service providers so that they were fully aware of the amount due to each one of them

(ii) Demand driven approach in planning: Under the project, concerned users have made final decision for choice of technological interventions regarding natural resource development. This, along with contributory approach, have been the most significant factors which helped in achieving active participation of people even if some other prerequisites of

participatory approach could not be satisfactorily adopted under the project. Main factors that helped in making the plan demand driven are as follows.

- Willingness to invest project funds on indigenous technologies
- Identification and analysis of success stories (irrespective of their source of innovation) and facilitating their replications under the project.
- Willingness to implement different options proposed by users even for addressing the same type of problem.
- Consolidation of action plan after getting written proposal from users.
- Flexibility in modification of action plan even during implementation phase provided there was no additional financial implication on the project.

(iii). Paired group concept to create peer pressure for timely recovery of revolving fund: Recovery of revolving fund for non-land based enterprises has been generally poor. Under the project an alternate concept of 'paired grouping' was attempted for creating a peer pressure for timely recovery of the fund. Under this concept a pair of mature credit and thrift groups were identified in the beginning and both groups passed a common resolution that one will use revolving fund in the first chance and the other group would wait till it is refunded as per the understanding. Such an arrangement has been helpful in creating a desired peer pressure without any external facilitation. The next round of revolving fund follows the same paired concept with the new group to be added each time.

(iv) Towards equity for resource poor families and empowerment of women: For achieving above objectives attempts were made to pursue the following two aspects, namely: payment of due wages to labourers; and working out modalities for preferential sharing of usufructs over bio-mass from common land resource. Regarding payment of due wages to labourers, two specific steps were taken to address equity: (i) payment to labourers as per SSR without any deduction of contribution from wages, (ii) equal wages to men as well as women even when work was implemented through SSR.

(v) Building the capacity of office bearers of WC to become WDT in new watershed programmes: Under participatory approach WDT members are expected to play a facilitatory role and community is expected to gradually takeover responsibility for managing watershed programme including planning, implementation, monitoring and evaluation. Under the project, intensive efforts were made to build capacity of locally available social

workers in participatory management of watershed programme. Based upon good performance, these persons were hired even as WDT by other PIAs in the district. The ongoing watershed programme, therefore, provides a good opportunity to build capacity in rural areas (through actual work experience) so that programme could be expanded in future through cascading effect.

(vi) New insight into indigenous management of jal land: Red soils are characterized by high percolation rate, on account of higher percentage of sand fraction. However, some unusual patches are observed in this region where sub-soil in root zone is very compact; with the result water tends to move laterally in the root zone rather than vertically. Due to low rate of vertical movement, such patches often get waterlogged during rainy season; because of which conventional rainfed crops of the region like sorghum, castor etc. cannot be grown successfully. Innovative farmers have however evolved the following practices! measures to convert the above liability into a productive asset.

- Terracing the *jal* land to further increase moisture availability in root zone in order to grow short duration rainfed paddy crop. This measure is usually adopted in those *jal* land patches which are located in upper part of a micro watershed.
- Construction of *Jal Kunta* (seepage pond) to improve moisture availability for rainfed paddy crop being grown in its command area. The water collected in such a kunta does not percolate downward due to compact sub soil. It only tends to seep laterally in sub surface to supplement moisture for paddy crop on the lower side. This type of structures is usually observed in middle portion of a micro watershed.
- Construction of *Yatam kunta* (dug out pond) to collect water that is coming through sub surface flow. The collected water is manually lifted to provide supplemental irrigation to crops in the same field. Such structures are usually seen towards lower portion of a micro watershed.
- Construction of *Katwa* (earthen or cement embankment) in *jal* land drainage course (across the slope) in order to lift the height of flowing water so that it is diverted in adjoining *jal* land fields for providing supplemental irrigation to rainfed paddy crop. Such structures could be constructed even in non *Jal* land drainage courses.

Even before the watershed project, a limited number of above measures were already implemented by farmers themselves. Under the project these measures were promoted in

other fields and also where these have become non-functional due to inadequate repair and maintenance.

(vii) Implementation of works without using any contractor: Under the project, approved works were implemented by people themselves without giving contract to any person. After receiving required contribution watershed committee identified labourers, masons, material providers, equipment owners, etc and asked them to execute works as per approved SSR. The payments were making through cheques directly to each service provider by WC after proper supervision of quality by WDT (particularly in case of costly structures), certificate of completed works by concerned user, entry in Measurement Book by watershed committee / WDT etc. Only in some cases concerned users were asked to implement it through different service providers. The payment to each one of them was however made directly by WC through cheques after completing above mentioned requirements.

Weak Points

(i) Low emphasis on production enhancement activities: Overall development of watershed passes through 3 different phases: namely; (i) organization of community, (ii) development of natural resources, and (iii) enhancement of production and income from land based commodities and non-land based livelihoods. Under the project, main attention so far could be paid towards organization of community and development of natural resources. The participatory approach (which consist of demand driven planning, collection of genuine contribution from actual users, implementation of works by community rather than contractors, etc.) required full time attention of WDT / PIA in order to achieve desired level of physical and financial progress with respect to natural resource development. This has resulted into relatively lower attention to the third component related to enhancement of production and income from land based and non-land based enterprises.

Lack of adequate attention towards the third component had also been due to the fact that no specific budget allocation has been made for this purpose. Hence it could not become an important part of agenda item during regular reviews by funding agency. But real enhancement of production and income requires focused extension efforts towards improved management practices of each commodity and enterprise. Under the project, a revolving fund was created for enhancement of productivity of rainfed crops. This has helped to some extent in promoting the use of improved inputs in the concerned crops.



Similar provision may also be considered for allied enterprises like horticulture, animal husbandry, fisheries etc.

(ii) Inadequate support for non-land based livelihoods: Under the project, a specific provision of revolving fund was created for supporting non-land based livelihoods for members belonging to Resource Poor families. During first year of the project period, considerable efforts were made to organize livelihood- based groups. Their capacity on technological aspects was also built and revolving fund was provided to start implementation of concerned livelihoods. Severe difficulty was however faced in recovery of amount with the result long term purpose of benefiting more number of groups could not be achieved.

Experience with revolving fund elsewhere has revealed that chances of recovery are higher only in those groups, which have been organized through credit and thrift activity. In such cases, group members are identified on the basis of social affinity rather than similarity in livelihoods. Incidentally in project villages a number of credit and thrift groups of resource poor families (also known as Self Help Groups) already existed, which were organized under DWACRA scheme by DRDA. The major part of revolving fund under watershed project was not routed through these groups thinking that sufficient money was any way being provided to them through other schemes. There is however, a need to integrate revolving fund under watershed programme with mature credit and thrift groups, even if they are organized under other schemes. The purpose for using the above amount may however be kept intact as per the objective of the project.

(iii) Lack of sustainability of community based organization: Under the project a new institutional set up has been created at village level to manage watershed project through participatory approach. This set up consists of four types of groups namely, Self Help Group (SHG), User Groups (UG), Watershed Association (WA), and Watershed Committee (WC). SHG were formed on the basis of similarity in livelihoods. Likewise UG were formed on the basis of similarity in ownership of natural resources namely land owners groups, water owner groups, perennial vegetation groups in common land, etc. With respect to land resource, small size user groups were formed on the basis of their land ownership in a compact block or in a mini-watershed. In case of water resource, small size user groups were formed on the basis of their own water resource under a particular water harvesting structure. In case of perennial vegetation in common land, entire community of the village

was considered as a group, as most of the members were using one or other type of bio mass.

The above approach of forming SHG and UG was found to be helpful in focusing attention of its members around a common interest, which matched with project objectives. This has also helped in facilitating required group action for planning or implementation of particular measures / structures. The sustainability of UG however appears to be low. These groups are likely to continue as long as particular **activity** regarding development of specific resource is continued. Like wise sustainability of WC and WA also appears to be limited. These are management bodies of new institutional set up under the project. Therefore these are also likely to be active as long as implementation phase of the project is continuing. Once the development fund released to WC/WA is utilized, the above management bodies may not have sufficient reasons to continue. Like wise amount available under revolving fund and also watershed development fund (i.e. contribution collected from participants) may also get finished unless sustainable mechanism as well as institutional base was evolved for their utilization. Recently some attempts have been made to evolve sustainable institutional set up at the village level.

(iv) Difficulties in supervising quality of engineering works done during peak periods of implementation: Under participatory approach implementation of works is to be done by community rather than contractors. This has put a heavy responsibility on office bearers of watershed committee particularly on its paid employees (namely, secretaries and volunteers). Under the project there are following six types of works / measures which are to be implemented by the committee.

- Works under entry point activity.
- Soil and moisture conservation measures in private land
- Loose boulder checks in drainage courses
- Water harvesting structures at need based locations
- Plantation of horticulture in private land
- Natural regeneration or new plantation of forestry in common land

Under the project office bearers of WC have been able to do satisfactory jobs regarding: maintenance of physical and financial records; payment to labourers as well as to other service providers; collection of contribution from real beneficiaries; preparation of progress

report for periodic review by funding agency, etc. A proper training of these members and regular follow up support by WDT were required for about 6 months to build the capacity. It has however been observed that the following four types of jobs could not be done satisfactorily by the office bearers of WC.

- Supervision of quality of works during construction
- Writing of Measurement Book particularly for costly structures
- Calculation of amount to be paid to labourers and masons during construction of costly structures.
- Interpretation of technical design and estimate of costly structures.

The above limitations were experienced essentially due to the following constraints: lack of supervisory skills with office bearers of watershed committee and users; lack of proper selection of skilled labourers and masons to do required jobs;

(v) Lack of balanced investment on different components: Under the present programme, development of natural resources has been the major concern. It consists of three main components namely: (i) development of private land resource; (ii) development of water resource and (iii) development of common land resource. Development of private land in turn deals with three types of land resources namely cultivated land, fallow land and drainage course. Plantation of horticulture is yet another component in the private land. Each of these components require their own share of investment depending upon severity of resource degradation, potential for its development, quantity of works carried out earlier in the project area, etc. Hence it is not proper to define a uniform ceiling for various components in all watersheds by outside agencies. A need-based allocation of funds for each component may be done by concerned watershed community before preparation of detailed action plan of these components.

Under the project, soil conservation in private lands was taken up as a first activity. This was relatively an easier component for preparation of estimates, orientation of labourers about the design, training of office bearers of WC to maintain records, collection of contribution, implementation of works without contractors, etc. But due to demand driven approach in planning, the proposals came forward from majority of participants (even from those for whom this was not the most important component). Hence more than two thirds of the funds were blocked only for this component.

Preparation of action plan for development of water resource and common land resource are likely to take longer period if participatory approach is to be followed, detailed design and estimates are to be prepared, genuine contribution is to be collected from actual beneficiaries, equity for resource poor is to be facilitated, group action and conflict resolution is to be achieved, etc. Hence it would be advisable if an overall strategic plan is prepared where need-based allocation of funds for different components is done in advance (in consultation with respective community) so that it may lead to a proper investment on each aspect even if their detailed design and estimates are prepared later on.

(vi) Lack of sustainable arrangements for post project maintenance of structures:

Sustainability of physical structures implemented under the project had been a serious concern at all levels. It was expected that post project maintenance may not be an issue to worry about if planning is done through demand driven process; indigenous technology is implemented; constructed structure is economically beneficial; genuine contribution is paid by concerned users; collected amount is kept in a common fund with the community, etc. Even where all above aspects have happened in a positive manner, it is still not clear whether post project maintenance of these structures would go smoothly. Some of the possible issues, which need to be addressed in order to ensure sustainable arrangement on this aspect, are indicated below.

- Providing legal ownership of above structures to concerned user groups. Usually all types of common property resources (CPR) at the village level are owned by Panchayat. Since maintenance responsibility of new structures is to be owned by concerned users, it may be better to handover structures to concerned user groups.
- Organization of user groups (of members who are primary beneficiaries of the structures) through credit and thrift activity so that they get a chance to meet regularly and raise funds for maintenance of structures. This kind of saving groups get an opportunity to meet regularly, maintain records and proceedings of the meeting, take bank loan, etc. These meetings can be used as occasions for discussing other common agenda items like repair and maintenance of the structures, etc.
- Evolving sustainable mechanism to utilize the amount under Watershed Development Fund towards post project maintenance. The mechanism may be such that the principle amount does not get reduced. Hence it may preferably be used as a matching revolving

fund to be given (as loan) to mature credit and thrift groups. This amount should however be used for maintenance of community oriented structures.

(vii) Lack of approval of some proposals made by community members:

Consolidated action plan under the project consists of only those proposals which have been made by community members. Hence there had been no hesitation in giving due consideration even to indigenous technologies. There were however few proposals which could not be included in the action plan inspite of high degree of persuasion by farmers. Some of these proposals and the reasons behind non-consideration under the action plan are indicated below.

- *De-silting of tank bed:* This proposal could not be considered because of the fact that it may require heavy investment to desilt all tanks in project area, and also because operational modalities could not be evolved to avoid indirect contractorship. The fear was that most of the money may go to a limited number of tractor owners.
- *Terracing of field in Jal land:* This proposal could not be accepted because it was not a normal recommendation for the shallow red soils, and also the cost per unit area was high. Besides this SSR for such an item was not available.
- *Provision for employing a person for watch and ward in the forest land for facilitation of social fencing:* This proposal could not be accepted as the item has not been included in the SSR.
- *Construction of a big size check darn:* This proposal could not be considered due to high cost of the structures (above Rs.2.0 lack).

Under the participatory approach, suitable solutions need to be found for each of the constraints indicated above. One of the important options could be to advice concerned farmers to pay higher rate of contribution (may be 25-50 percent) so that over all cost is reduced, and also utility of the proposal and stake of farmers gets further established.

**Source: Reproduced from Participatory Management of Mahchal Watershed:
Successes and Failures, "MANAGE" publication, Hyderabad**

4. OPERATIONALIZATION OF CAPACITY BUILDING STRATEGY FOR WATERSHED DEVELOPMENT PROGRAM IN ANDHRA PRADESH – ROLES AND RESPONSIBILITIES OF DIFFERENT STAKE HOLDERS

Andhra Pradesh has the highest number (over 9000) of watershed projects in the country at different stages of implementation and under various schemes. In order to bring in qualitative improvements in the ongoing watershed programs, the Government has initiated AP Rural Livelihoods Project with the assistance of DFID in five pilot districts (Ananthapur, Kurnool, Nalgonda, Mehaboobnagar and Prakasam). This project has demonstrated that important concerns like equity, gender, productivity enhancement, livelihoods promotion and simple technologies could be integrated in the ongoing watershed projects. Based on this experience, it was decided to up scale this experience in all districts of the state.

Commissionerate of Rural Development has facilitated the evolution of a Capacity Building Strategy through several consultative processes and workshops of Project Directors, PIAs, and Resource Organizations. Based on this strategy, this note on “Operationalization of Capacity Building Strategy for Watershed Development Program in Andhra Pradesh – Roles and Responsibilities of Different Actors” is prepared. Representatives of Programme Management Unit (PMU, AMR APARD and WASSAN participated in this process. This note particularly refers to expected roles and responsibilities of different actors in operationalizing the capacity building strategies.

Proposed Institutional Partners in Capacity Building Strategy:

The Capacity Building Strategy for Watershed Program recognizes the need for collective action by several institutions at different levels. In this context, it is important to define the roles and responsibilities of different members and establish institutional arrangements in delivering capacity building inputs at different levels. While retaining the importance of Grama Panchayat, Village Organization and PIA as main coordinators and demand generators for the capacity building inputs, an institutional arrangement is proposed here to cater to the capacity building needs of all the stakeholders. The institutional members are:

- A. Livelihoods Resource Centers (LRC) at cluster level

- B. District Livelihoods Resource Centers (DLRC)
- C. Program Management Unit, Commissionerate of Rural Development
- D. AMR – APARD as an anchor organization
- E. State Level Consortium of Resource Organizations
- F. Members from Reputed Resource Organizations
- G. WASSAN as a secretariat to Consortium

A. Livelihoods Resource Center at cluster level:

The capacity building strategy recognizes the need for an easily accessible and dependable capacity building infrastructure and facilities for village level functionaries like members of Grama Panchayat, villager Organization, User Groups, SHGs, labor groups, volunteers, secretaries and so on. It is important to understand that the LRC would provide the necessary infrastructure and facilities for capacity building, while a Pool of Resource Persons (PRP) takes up the functional responsibilities and provides capacity building inputs.

1. Structural Aspects of LRC:

- i) For every cluster of 50 to 60 watersheds (under different stages) and/or 5 to 6 PIAs, a Livelihoods Resource Center (LRS) would be established. The LRC would act like a “One Point Stop” for all learning needs of the primary stakeholders in 50 to 60 watersheds under its command area.
- ii) The LRC will preferably be located in a Mandal Resource Center, which is centrally located to the 50 to 60 watersheds in the given mandals. Alternatively, the LRC can be located.
 - a. Any other government/ institution with required infrastructure.
 - b. Wherever good infrastructure facilities are available with NGOs in the region.
- iii) The LRC would be equipped with adequate training facilities and relevant resource materials (modules, communication material, audio visual aids and so on).
- iv) This center would be a repository of knowledge and best practices and act like Knowledge Center at cluster level for all the associated watersheds and PIAs.
- v) The LRC would be having a skeletal staff of two persons to facilitate the capacity building inputs and manage the center. These two persons are
 - A Course Coordinator,
 - One Assistant



- vi) The staff of LRC would be imparted orientation and aspects related to the management of LRCs at state level.

2. Functional Aspects of LRC:

- i. The LRC would act like a learning center for members of Village Organization, User Groups, SHGs, Labor Groups, PRI members, village level functionaries and others.
- ii. It is envisaged that the LRC would be able to access the services of a large number of experts/ resource persons/ facilitators to support the capacity building activities in their center/-attached watersheds. This group of resource persons would be called "Pool of Resource Persons".
- iii. Individuals and representatives of the following institutions could be selected and trained as members of PRPs.
 - Experienced Farmers in the catchment of the LRC
 - Experienced members/ leaders of existing CBOs in associated villages
 - Representatives of NGOs/ PIA associated with the LRC (WDT/ NGO Coordinators/ Any other experienced person)
 - Representatives of PRI/ NGO working in the region
 - Representatives of Velugu working in the region
 - Government officers from line departments
 - Other empanelled resource persons
- iv. The members of PRP would be formally empanelled based on certain objective criteria by a committee. Details of this committee and the process of selection of PRPs would be issued separately.
- v. This center also acts like a nerve center for a variety of functions that strengthen watershed activities in the given cluster. (Eg: Participatory monitoring, process review and monitoring, data management and so on).
- vi. The cost norms for conducting different types of capacity building activities would be communicated in a separate circular.

3. Action Plans for Capacity Building:

- i. The group of PIAs or Network of NGOs associated with a LRC would develop an action plan for project and related capacity building action plans.

- ii. The group of PIAs/ Network of NGOs would compile these action plans for capacity building for a given time frame. This sets the agenda of LRC in terms of capacity building inputs to be provided at the LRC.
- iii. Similarly, action plans for capacity building would be developed by each Village Organization for different actors at the watershed level, with the support of PIA. These action plans also would be compiled at LRC level.
- iv. Based on these action plans from group/ network of PIAs and VOs, the Course Coordinator would develop a calendar of events for the 50 to 60 watershed projects. This also becomes the basis for coordinating with PRP to deliver the capacity building inputs at the LRC.
- v. MDT concerned would initially scrutinize the action plans for capacity building and community organization. The final approval of the action plans would be made in a process similar to that of other plans, for which separate guidelines are issued.

4. Finances (Needs inputs):

- i. The community organization and capacity building portion of the budget should be transferred to the VO through the Grama Panchayat concerned. The VO in turn will sponsor the trainees to the LRC, by paying the required fees.
 - a. In Case of Ongoing Watershed Projects: The unspent amounts available under CO and CB with PIA/DWMA are to be transferred to the Gram Panchayat and then eventually to VO.
 - b. In Case of New Watersheds: The budget of CO and CB should be transferred by the DWMA to Gram Panchayat and eventually to VO.
- ii. The utilization of this budget is according to the action plan for capacity building and community organization at VO level.

B. District Livelihoods Resource Centers:

Similar arrangements are to be made at district level for building capacities of secondary stakeholders like WDT, PIA, MDT and other line department functionaries.

The structural and functional aspects and planning processes at district level are as follows.

1. Structural Aspects of DLRC:

- i. The DLRC will be located in DCBCs/TTDC/ Mahila Pranganams/ KVK/ any other training centers (NGO/ GO) located in/ nearer to the district head quarters, having required space and other infrastructure faculties, for conducting residential training programs.



ii. Each DLRC would have a team of three to four persons. ‘One Course Director, One Assistant Course Director, One Assistant’.

iii. The team would report to Project Director, DWMA.

iv. These members should have expertise in coordinating the functions of the DLRC (logistics, liaisoning, reporting, data management related to capacity building functions and so on).

v. The orientation and training to the staff of DLRC on management of DLRC would be imparted at state level.

2. Functional Aspects:

i. The DLRC would primarily act like a learning center for secondary stakeholders. Providing capacity building inputs (conducting training programs and other knowledge inputs) to secondary stakeholders (WDTs, PIA coordinators, MDTs) is the main responsibility of DLRC. District Level Pool of Resource Persons would take up the responsibility of actual delivery of the CB inputs.

ii. This center would be a repository of knowledge and best practices and act like a Knowledge Center at district level. The DLRC would have the following facilities/ infrastructure/ Services:

- Library on NRM/ Watershed/ Social Mobilization/ Capacity Building/Livelihoods
- Computer and internet facilities
- Resource material and modules
- Facilities for conducting training programs (hostel, conference hall, food and other)

iii. This center also acts like a nerve center for a variety of functions that strengthen watershed activities like documentation, repository of resource material, dissemination center.

iv. It is envisaged that the DLRC would be able to access the services of a large number of experts/ resource persons/ facilitators to support the capacity building activities in their center. This group of resource persons is called “Pool of Resource Persons”.

v. The Pool of Resource Persons (PRP) will actually deliver various aspects of capacity building required for operationalizing the capacity building strategy.



- a. PRP members would be empanelled by a committee as indicated earlier (2)iv under LRC. The existing DCBC members will also be part of the PRPs.
- vi. Coordinate with DCBC/ PMU/ State Level Resource Organizations/ Consortium of Resource Organizations in developing the capacities of members of PRP.
- vii. DLRC facilitates the development of district specific modules and material out of emerging needs.
- viii. A Network of PIA partners involved in implementation of watershed projects will provide the framework for capacity building inputs to be provided by DLRC.

3. Action Plans for Capacity Building:

- i) For every quarter, PIAs of the district would develop an action plan for the project based on the project cycle and the capacity building needs of the secondary stakeholders.
- ii) Based on such capacity building action plans, the DLRC would develop its own training calendar and other inputs for capacity building of secondary stakeholders.

C. Project Management Unit, Commissionerate of Rural Development:

Project Management Unit at Commissionerate of Rural Development is specially created to provide professional inputs to the watershed project at state level. It is specially set up as a coordinating agency. It is charged with the responsibility of scaling up innovative strategies in Watershed based Rural Livelihoods. The members of PMU have expertise in different fields – capacity building; livelihoods, productivity enhancement; project management; micro finance and so on. In the capacity building strategy, the PMU, office of the CRD has a special role, which is mentioned here.

- a. Sensitize the district administration on the capacity building agenda and create necessary policy environment.
- b. Indicate the priority areas of capacity building to the consortium from time to time.
- c. Facilitate the assessment of the capacity building needs of different stakeholders (primary/ secondary/ tertiary) from time to time and indicate them by using the services of the consortium and AMR APARD.
- d. PMU is a member in the Consortium of Resource Organizations and participates in the meetings of the same.
- e. Members of PMU act as resource persons for explaining the policy directions on different themes and enhance the understanding of the consortium members.



- f. PMU will issue guidelines for project directors for identifying the physical structures of LRC/ DLRC.
- g. Ensure necessary funding support from DWMA to strengthen the capacity building agenda at DLRC/ LRC levels.
- h. Mobilize adequate financial resources to strengthen the capacity building process of pool of resource persons and secondary stakeholders (PIA coordinators, MDT, CRD staff), over and above normal provisions available under the watershed projects.
- i. Support the evolution of collaboration of partnerships at state/ district/ local levels.
- j. Review and monitor the action plans for capacity building at state/district/ local level.
- k. DWMA will play a similar role through DCBC members at District level.

D. AMR –APARD:

AMR-APARD is the state level apex training institution for the PR & RD departments. The Commissionerate of Rural Development has been utilizing the services of AMR-APARD from time to time as per the capacity building requirements. Based on the needs of the watershed project in the state, a clear role was envisaged for AMR APARD on a long-term perspective. With the experience and expertise available on various themes related to rural development (watershed, PRIs, drinking water and sanitation, so on), AMR APARD is expected to provide necessary professional support and direction to the agenda of capacity building in the state. The roles and responsibilities envisaged for AMR APARD are mentioned below.

1. General Functions:
 - i) AMR APARD would act like a Nodal Agency for Commissioner, Rural Development for capacity building purposes.
 - ii) As a Nodal Agency, AMR APARD would be responsible for developing/ fine-tuning capacity building strategy and facilitating the implementation of the same.
 - iii) AMR APARD would act like a Knowledge and Documentation Center for watershed program at state level.

iv) AMR APARD supports PMU, office of the CRD in organizing specific training programs for secondary stakeholders.

2. Support Functions to Consortium of Resource Organizations:

Support the capacity building strategy by

- Collaborating with Consortium of Resource Organizations at state level.
- Developing partnerships with WASSAN, a state level resource organization for acting as a secretariat to the Consortium of Resource Organizations.
- Developing and entering into MOU between AMR-APARD and members of Consortium of Resource Organizations on their roles and responsibilities.
- Developing partnerships with members of Consortium of Resource Organizations on theme specific projects/ tasks to be performed by the members with a TOR.
- Approval of TORs and channelizing funds for different activities of Consortium and its members based on clear action plans/ projects prepared by resource organizations.
- Participate in the quarterly review meetings of Consortium of Resource Organizations
- Organizing sharing workshops once in six months for all members of Consortium of Resource Organizations.
- A core Group with AMR-APARD, PMU, WASSAN would facilitate the process of sanctions.

3. Support Functions to PMU, CRD/ DWMA:

- i. Support the process of establishing District and Cluster Level Livelihoods Resource Centers in terms of
 - a. Finalizing the selection process and criteria for identification of Resource Centers at cluster/ district level. Based on this, PMU, office of the CRD would identify the district/ cluster level Livelihoods Resource Centers.
 - b. Support DWMA and other resource organizations in recruitment of staff
- ii. Developing a model MOU between DWMA and DLRC and between APARD & CRD, between APARD and LRCs and DLRC and formalizing the same
- iii. Developing cost norms for different activities
- iv. Developing systems for fund flows and monitoring systems
- v. Report to PMU, office of the CRD on the progress and over all achievements.

E. Consortium of Resource Organizations

Andhra Pradesh has a rich pool of resource organizations, which have considerable experience and expertise on different themes. A state level Consortium of Resource Organizations is to be constituted.

Roles and Responsibilities of Members of Consortium:

The main functions of the members of this consortium are envisaged at two levels, which are mentioned below:

1. Decision Making Functions:

i. Participate in the consortium meetings and contribute to

- The evolution of over all development of the CB strategy.
- Action planning process at state level/ district level for strengthening capacity building inputs.
- Review the progress and provide inputs to improve the performance.

ii. Support the process of creating favorable policy support to the capacity building agenda in terms of contributing to:

- The process of establishing LRC (selection criteria; selection process)
- The cost norms for different activities
- Selection process of individuals for PRP

iii. Decisions on allocating tasks to any resource organization and/ or taking the services of engaging any resource organization.

iShare the experiences, knowledge and resource material with the consortium – through participating in workshops; e-groups and so on.

- i. Comment on the quality, utility and relevance existing modules and new modules (that would be developed from time to time).

2. Professional Support:

i. Depending on the need, each member may take up a specific theme (based on their expertise and experience) and undertake the following activities.

- a. Develop resource material and modules for capacity building purpose.
- b. Develop capacities of “pool of resource persons” on the given theme.
- c. Provide backstopping support to the PRP members on the given theme.

ii. Depending on the experience and expertise, the level at which these resource organizations operate could be decided (mainly related to target groups).

iii. The members of Consortium may take up the role of anchoring and/or backstopping a LRC in a given district and make it a model LRC on a given theme.

iv. Undertake any action research project (studies, innovations, field level experimentation) in terms of enhancing capacity building agenda.



v. This consortium is mainly proposed to support the capacity building initiatives in the scaled-up scenario of watersheds in the entire state of Andhra Pradesh. The existing members in the CB group, Enterprise Development Group and Productivity Enhancement Group would automatically be members of the consortium. Even then, the Groups may still exist in order to generate inputs for capacity building especially in Enterprise Development & Productivity Enhancement. Thus, the groups will be centers of generating new ideas while the consortium will be focusing on implementation of CB strategy.

Similarly, the office of the CRD may enter into separate agreements with individuals/organizations for carrying out innovative work in order to generate new ideas/practices which may feed into the CB strategy at a later date.

F. WASSAN, as secretariat for consortium:

As a state level resource organization involved with Watershed Development Program, WASSAN has expertise in the areas of training, field support services (hand holding support to PIA), production of resource material/ modules, policy advocacy and networking, WASSAN would function as secretariat for the Consortium of Resource Organizations. The roles and responsibilities of WASSAN are mentioned below. These responsibilities are at two levels.

1. Secretariat Functions:

WASSAN functions as a secretariat to the Consortium of Resource Organizations by taking up the following responsibilities.

- i. Communications with the members of Consortium of Resource Organizations
- ii. Setting the agenda for meetings of Consortium of Resource Organizations in consultation with AMR-APARD and members and communicating the same to members.
- iii. Organize coordination and review meetings of the consortium for strengthening the capacity building inputs from time to time.
- iv. Provide independent feedback to the Consortium of Resource Organizations on the process of providing capacity building inputs by PRP at DLRC/ LRC.
- v. While the AMR-APARD anchors the consortium in all other aspects WASSAN would provide secretarial support in view of its position and networking capacities with NGOs.

2. Professional Functions:

- i. Facilitate the process of identification of potential resource persons to form Pool of Resource Persons in each district from the existing networks of NGOs and other resource organizations.
- ii. Develop appropriate quality enhancement systems in capacity building inputs.
- iii. Consolidating, standardizing, production/ printing of the capacity building modules that are available in Andhra Pradesh on watershed/ NRM/ Social mobilization and make them available for the PRP/ Consortium members/ LRC/ DLRC through a process to be set up.
- iv. Facilitate the process of developing new modules along with members of consortium on the selected themes.
- v. Depending on the need, develop modules and resource material on the themes as per the capacity building action plans.
- vi. Develop the capacities of the resource persons to act as facilitators in capacity building process.
- vii. Supply of resource material and modules to the DLRC/ LRC.
- viii. Develop associated strategies (communication campaigns and so on).

5. GENDER IN WATERSHED DEVELOPMENT

Gender is a useful socio-economic variable to analyze roles, responsibilities, constraints, opportunities and incentives of the people involved in development project. Gender concerns are increasingly taken seriously by the government and there has been an increase in special developmental programmes and schemes for women. Although several NGOs started focusing their activities explicitly on women, there are concentrated only in particular regions and the key areas of their work with women include economic support and services, health and family planning, social, political and legal issues and labour conditions. There are very limited experiences where the gender concerns are studied with a holistic view, integrating all the aspects of life such as social, economical and technological issues, keeping agriculture and other livelihood options as the basis. This is a massive task and it is possible to achieve only through the government system, particularly the agricultural extension system, as it has got a fairly large number of extension personnel compared to the other sectors.

Gender Mainstreaming

Mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in any area and at all levels. It is a strategy for making the concerns and experiences of women as well as of men an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so that women and men benefit equally, and the inequality is not perpetuated. The ultimate goal of mainstreaming is to achieve gender equality.

According to the Participatory Watershed Guidelines issued by the Government of India in 1994 encourage the greater participation of women and marginal groups. However, their implementation continues to be hindered by beliefs that watershed development is land development for landowners. Women are often not recognised as members of the watershed community in their own right, but are viewed as being there to fill the quota which the Guidelines outlines. The Guidelines do not specify any mechanism or institutional arrangement for ensuring and sustaining the true involvement of the poor and women.



Efforts are being made to change the *status quo* by capitalising, for example, on the strength of existing women's groups by drawing their membership into other government programmes, including watershed development. But many women's self-help groups have remained fairly autonomous savings initiatives with no direct link to natural resource management.

Developing land development planning on the basis of existing use and dependence patterns could bring poor women into centre stage as key participants. Effective gender sensitisation programmes must shift from the current emphasis on numbers of women in groups or amounts saved, towards identifying and addressing workloads, access to resources etc. Some government and NGO programmes are promoting gender sensitive planning and decision-making. Empowered and self-confident women are likely to be able to articulate their needs and plan their livelihood strategies, encompassing all aspects of their lives, not just the agrarian-type activities. Women's involvement is not just needed at the village level but at the district, state and national level if lasting change is to occur. If the way the watershed programme is viewed is changed so that it is seen as a 'rural livelihoods' rather than a land development programme, women and the poorer marginal farming households will benefit, given their dependence on many non-land-based activities. Finally, there is a need to ensure that women do not become overwhelmed by schemes and programmes focused at them. They need to be able to make informed choices about where to invest their time.

Women's Participation in Watershed Development in India

In this paper we look at who participates in the watershed development programme and describe some of the efforts being made to ensure that people who are left out of land development activities are included. We look particularly at the role of women in watershed development. It is our contention that in reality the watershed programme continues to be primarily land-based and landowner focused, and therefore 'male-focused', given the control of land-ownership in India, and does not take adequate account of the role women play in the rural economy. One may ask whether it actually matters whether people are left out, given the many other national and state government schemes, as well as non-governmental organisation (NGO) initiatives that are intended to enhance the livelihoods of the poor. We argue that it does matter, because women play a central role in agricultural development and the management of natural resources and they have a right to an equal say in the way those resources are developed, managed and used. In addition, land-based activities usually generate more income, and carry less risk, than the non-land-based activities that women are often encouraged taking up.

The Guidelines state the objectives of each watershed development project as promoting economic development, the restoration of ecological balance, and giving *“special emphasis to improve the economic and social condition of the resource-poor and the disadvantaged sections of the watershed community such as the asset less and women”*.

The Guidelines promote a bottom-up planning approach, working where possible through NGOs and with community participation as a central principle.

Under the Guidelines, watershed projects should start with general awareness-raising, followed by the establishment of user groups and self-help groups that include women or are exclusively for women. Representatives of these groups, together with other villagers, should then go forward to form the watershed committee. This is intended to ensure adequate representation in the committee of different sections of the community. Thus, a participatory approach through different common interest groups, including self-help groups, should be adopted as a tool for implementation. This is the ideal, with the watershed plan prepared according to the needs and preferences of local people who are members of the Watershed Association that elects a watershed committee. The genuine representation of marginal farmers, the landless and women in the committee should generate a process that is as concerned with water and common pool resources as with private land management.

How does the current approach affect women?

Women's involvement with natural resource production and management is not confined to agriculture; gender roles typically tie poor rural women far more than men to direct and regular use and dependence on natural resources, particularly common lands, forests and water.

The watershed programme has altered access to Common Pool Resources (CPRs) such as village common lands, forests and water resources through the creation of, for example, tree plantations in these areas. The closure of common lands for tree plantations leads to the loss of access to grazing areas. This particularly affects the landless and poor, single women eking out a living by raising a few goats, forcing such villagers to sell small livestock or change to a stall-fed system, which usually increases the workloads of women and children. This problem is particularly acute where there are limited areas of CPRs and where the community is highly stratified. Without planning processes giving focused attention to the resource use patterns of

the poor and women, such CPR development often curtails, rather than increases their resource access.

Furthermore, women control a small fraction of all agricultural land and have in the past been systematically ignored by all institutions, households, community and government bodies in planning for natural resources. *“Land defines social status and political power in the village and it structures relationships both within and outside the household. Yet for most women, effective rights in land remain elusive, even as their marital and kin support erodes and female-headed households multiply. In legal terms, women have struggled for and won fairly extensive rights to inherit and control lands in much of South Asia; but in practice most stand disinherited. Few own land; even fewer can exercise effective control over it.”* (Agarwal, 1994).

The largest budgetary provision under the Watershed Guidelines remains for land development. While private landowners have to contribute 10% of their land development cost through voluntary labour, the community as a whole is expected to contribute five percent of the cost of developing common lands such as grazing and forest lands. Given the role of women in many poor households as the gatherers of fodder and fuel, it often falls to them to contribute this labour on behalf of their households. They may not benefit greatly from such labour since the areas are ‘common’ land and may even, in the short to medium term, be worse off. Protection of a degraded area may transfer harvesting pressure to another area and this may increase women’s (and children’s) drudgery if they have to travel a greater distance to collect their daily requirements of fuel and fodder. Development of wasteland may change the species balance and some shrubs, grasses and trees valued as medicinal herbs or food by women and poorer households may be lost. Saxena (n.d.) writing about the impact of forest protection on women observes that *“the gender-differentiated impact is not restricted to firewood – it applies equally to other forest produce. For example, protecting sal trees with the existing technology of multiple shoot cutting results in the leaves getting out of reach. This affects the making of sal leaf plates, which is a common source of income, primarily for poor women in many parts of West Bengal, Orissa and Bihar.”*

The nature of participation: real or token?

Despite the Guidelines’ emphasis on the participation of women and other marginal groups, in reality this is proving more problematic to achieve for a number of reasons. Tensions continue

to exist between those involved in the watershed programme over who should be participating, and over the very meaning of 'participation' in terms of content and process. Some people in government departments and in NGOs continue to view watershed development as exclusively a private land-based programme leading to productivity enhancement and conservation. Land-based watershed projects are often perceived by the agencies involved as 'men's' projects and consequently not women's concern. Men, who have title to much of the productive land, are perceived to be the natural target-group for watershed work. This is reinforced by the Guidelines' budgetary allocations, which target a large amount of the money at land development activities. The development of local organisations, also envisaged in the Guidelines, is either ignored or, at best, used as an instrument for achieving the physical targets.

For example, 'participation' is sometimes reduced to contributing voluntary labour. Of course, involving people in the building of structures and other physical works seems like a useful way of encouraging community participation and ownership. But often those who contribute the free labour are the women; men may only get involved when the labour is valued and paid for.

The focus on women's participation in watershed development is not an isolated issue in present day India. It is part of a wider move to emphasise the need for community participation in the development process, in particular of marginal groups such as women. Take the example of local government bodies. A key village level institution in India is the *Panchayat* where 33% of posts are reserved for women. As different states in the country move towards decentralisation of development administration, *Panchayats* in future will play a significant role in managing watershed development. A recent poverty profile study in Himachal Pradesh (PRAXIS, 2000) shows that while the upper castes are able to identify closely with the *Panchayats*, this is not so with the Scheduled Castes, and among the Scheduled Caste groups the women know the least about the process. The findings showed that women feel distant from official institutions in general, including the *Panchayats*. The issues related to women's participation in both the *panchayats* and watershed committees are inter-linked; there is a need in both to create social space for them in such public fora and to help them increase their confidence and capacity to participate effectively.

Women are often not recognised as members of the 'watershed' community in their own right as farmers and resource decision-makers, but are seen as 'quota women'. Women involved in



watershed committees and other village institutions are often not given a chance to voice their opinions, or lack the self confidence and access to information to participate in informed decision-making (Box 1). A number of commentators have expressed the view that the token participation of two or three individual women in a watershed committee is not working. Instances have been recorded in a number of places in India where male members on committees take all decisions (often at meetings which women cannot attend because of the inconvenient time or social restrictions) and send the final resolution to the women members for their signature. Such women are not in a position to question the decision, or worse, if illiterate, they place their thumb-print on the document without knowing what they have agreed to.

Box 1. A woman's perspective on watershed planning

A woman member of the watershed committee in the tribal district of Surguja in eastern Madhya Pradesh was asked how women's priorities had been incorporated into the watershed plan. She said that she knew nothing about the plan or its contents. She complained bitterly about all the women in the village being debarred from wage employment on the watershed works. The agricultural officer present, the person responsible for the watershed project, explained to the visitors that women did not qualify for membership of land based 'user groups' because only men owned land. Hence, only male landowners had been considered eligible for wage work for land development. He went on to explain that two 'self-help groups' of women had been formed: one for weaving mats from palm leaves, and the other for making brooms. Each group had been given a returnable revolving fund of Rs 5000 to get on with regular savings and producing their respective products for earning income. The woman committee member fumed at the very mention of mat weaving. She told the visitors that it took 8 to 10 days to weave a single mat that could be sold for barely Rs 35 to 40. In contrast, the minimum daily wage for unskilled work was Rs 48.50. She went on to say that within her tribal community, the tradition was that both women and men controlled their respective incomes, thereby enabling married women to enjoy a relatively more equal status with their men and also ensuring greater household food security through their independent earnings.

How can we create better support for women's involvement?

Linking existing women's groups with the watershed development process



Some efforts are being made to capitalise on the strength of existing women's groups so that they can help increase women's participation in implementation of watershed and various other government programmes.

One particular area where encouraging women's involvement has often been successful has been in the development of micro-credit groups, where women are often the main clients. This is because women have less access to formal and other sources of credit, and so have an incentive to use micro-finance. In addition, they are included as beneficiaries in schemes for the poor because women make up a disproportionate proportion of the poor, and have a superior repayment track record.

However, women's self-help groups have remained fairly autonomous savings initiatives with no direct links to natural resource management, although loans may be taken to pay for agricultural inputs for their households.

Furthermore, questions remain about who is actually involved in the women's groups (do the poorest participate?) and where the money goes that these groups receive or earn in addition to their own savings. While some studies have shown that these savings and credit groups do make a difference to household food security or incomes by providing women with funds for household consumption (such as medicines, house repairs, school costs etc.) and investment in income-generating initiatives, others have questioned the groups' long term benefit for women and their ability to enhance women's status. For example, *"most women's organisations (whatever their political persuasion), with some recent exceptions, have been pre-occupied with employment and non-land-based income-generating schemes as the means of improving women's economic status and welfare, paying little attention to the issue of property rights."* (Agarwal, 1994)

Such schemes have not, therefore, been a vehicle for *directly* addressing women's empowerment and rights, but offer the potential to do so, especially in the context of watershed development, since the Guidelines provide scope for the user and self-help groups to be the building blocks in the process of developing broad-based participation in decision-making.

However, the 'building block' role of user and self-help groups in the watershed programme remains poorly understood. This is because the Watershed Guidelines do not specify any



mechanism or institutional arrangement for ensuring and sustaining the involvement of the poor and women in the programme on the basis of their resource use and dependence and ensuring equitable entitlements for them. *“In the beginning of the project itself, women and resource poor people are formed into self-help groups in order to meet the target and distribute the revolving fund among them. Thereafter, they are totally forgotten.”*

An initiative already being tested in Andhra Pradesh is attempting to link existing women's groups formally to the watershed programme. In March 1999, 1,200 women's self-help groups (SHGs) in Mahaboobnagar were linked formally to the watershed programme. Rather than joining DWCRA, these groups will receive support from the watershed programme and be 'building blocks' in that programme. This is a conscious effort on the part of GoAP to address the criticism of the watershed programme as being a men's programme and actively to pursue one of the often under-resourced aspects of the watershed guidelines.

In this approach, women representatives in the watershed committee will be representatives of the larger SHGs (and will be drawn from SHGs from different social and income groups) and will have the support and ideas of those women behind them.

Addressing and understanding the impacts on women

Despite the intentions of the Guidelines, women's involvement in the planning and implementation of soil and water conservation and in managing newly created resources in the watershed is limited. In part, this is because the Guidelines do not emphasise the importance of beginning the preparation of the watershed plans with an understanding and analysis of women and men's differing use and dependence on both private and common lands. Nor is the dependence for survival of landless and poor women on common land resources recognised.

The increase in the workload of women, at least in the initial years of watershed activities, needs to be recognised as they walk further for fuel and fodder or even water while nearby resources are replenished through land development works. When areas of common land are closed off to allow regeneration the distance women travel to gather fodder and fuel may not only increase substantially but they may also switch to inferior (and less efficient) fuels like leaves, husks, weeds and bushes because they can not access the fuel they require (Saxena). According to Marcella D'Souza (1999), women indicate their willingness to carry out this extra work provided it leads to the fulfilment of four basic needs:

1. Access to a reliable source of safe drinking water within a reasonable distance, and improvements in health and hygiene. It is found that often the irrigation and watershed activities that enhance water access for agriculture ignore women's water needs for household purposes, livestock etc.
2. Access to a steady flow of income to ensure food, fuel and financial security.
3. A secure future for their children through education.
4. Participation in household decision-making and community affairs.

Developing watershed plans on the basis of existing use and dependence patterns could bring poor women centre stage as key participants in decision-making as resource users and not simply as disinterested women to be involved 'somehow'. In the absence of such an approach, not surprisingly, one study of the watershed programme in Anantapur and Mahaboobnagar in Andhra Pradesh found many government and non-government agencies involved in the watershed programme continuing to believe that women should concentrate on domestic activities, like education, health, thrift and credit, and non-land-based income generation activities, without considering the equity impacts of such interventions (Adolph and Turton, 1998). However, the promotion of women's involvement requires careful management to ensure that the situation for women is not made worse by the intervention, particularly if men resent the attention and potential power women receive. For example, some NGOs are promoting 'women only' watershed development whereby a cluster of women's self help groups become the watershed association and hold free elections among their members to form the watershed committee. They contract labour as required and direct the work. The idea is that they control the land development.

Effective gender sensitisation programmes must shift from the current emphasis on numbers of women in the groups, or amounts saved, or separate schemes for women, towards identifying and addressing strategic gender interests (workloads, access and control over productive resources particularly Common Pool Resources, economic interests) in core activities. Kitchen gardens, CPR management control for fuel-fodder and grazing, non-farm activities etc., may be of more interest than token participation in land development or challenging cultural norms by forcing women into positions of leadership which are not supported by the wider community. In addition, such activities should also lead to more efficient and productive use of water and other natural resources.

Where effort is put into facilitating women-only fora for confidence building and overcoming cultural inhibitions, and men are motivated to support creating such spaces for women, the women often begin to share decision-making and even asset ownership (Box 2). Benefits delivered through women are reflected in better health, education and the overall standard of living of the family.

Box 2. Empowering Women to Become Effective Players

The commitment of AKRSP(I) (Aga Khan Rural Support Programme, India), an NGO working in Gujarat, to bringing women into both the organisation and implementation of all its programmes, led to a very different outcome in one of their watershed projects. During a gender sensitisation exercise with village women and men in one of the watershed villages, the amount of labour contributed by household women and men on private land development under the watershed project was calculated. The men themselves concluded that women were contributing roughly 50% of the labour and that 50% of the wages paid for the work should legitimately be paid to the women instead of the entire wage money being paid to the men simply because they were the owners. Empowered by such public acknowledgement of their normally invisible work, the women started depositing their share of the wage money in the common fund of their women's association. They used the money for undertaking collective activities in accordance with their own priorities.

AKRSP staff (pers. comm.)

Some government and NGO programmes are promoting gender sensitive micro-planning. Empowered and self-confident women are likely to articulate their livelihood strategies, allowing an exploration, with them, of how these can be strengthened and support the promotion of new, appropriate income-generating activities. Women from marginal groups can be encouraged to take part because their views on management choices related to crops, trees, grasses, pasture and shrubs, on land and non-land based activities and the use of CPRs are likely to be different from women from other groups. Separate micro-planning exercises with informed women and marginalised groups, which are then fed into a larger group process, are likely to ensure that their views are articulated and included, but this must be facilitated by field functionaries such as WDT social mobilisers/village professionals. However, these field functionaries will need attitudinal change, gender and equity sensitisation and skill training in order to be able to do this.

But women's involvement is not just needed at the village level. Women need to be involved in planning and implementation at district, state and national levels if they are to have any influence upon the programme as a whole.

Shifting the focus from watersheds to livelihood development

One may question whether an 'improved' natural resource base can provide adequate livelihoods for a growing rural population without negatively impacting on the livelihoods of those currently dependent on it. There is also no certainty that benefits will be equitably distributed without a clear policy of entitlements to the enhanced resource productivity accompanying watershed development. There is always a trade-off in switching from one resource use to another, in both social and economic terms, which needs to be recognised. Where land and water are involved, local politics invariably play a part because of the considerable economic gain that can be made from the exploitation of these resources. The watershed development programme is seen by some as a 'money-making scheme', thus attracting political interest. That interest can then influence the way the resources are dispersed.

In Andhra Pradesh the British Department for International Development (DFID) is working with the government to support initiatives that emphasise 'livelihoods' rather than just land-based 'watersheds' (Box 3), and trying to ensure that different interventions, for example support for savings and credit groups, perhaps health care, water and sanitation schemes as well as watershed development work are better integrated, so that they complement each other.

Box 3. Supporting Livelihoods Within Watersheds

DFID is supporting the Andhra Pradesh Rural Livelihoods Project (APRLP) in partnership with the Government of Andhra Pradesh and the Ministry of Rural Development (Government of India). The purpose of APRLP is to enable the Government of Andhra Pradesh comprehensively to implement pro-poor watershed-based, sustainable rural livelihoods approaches in five districts (Anantapur, Mahboobnagar, Prakasam, Nalgonda and Kurnool). The Project consists of three components: watershed-plus and sustainable rural livelihood initiatives; capacity-building for primary and secondary stakeholders; and lesson learning and policy influence.

This approach is likely to be of more interest to women than the watershed programme in its present form. By paying greater attention to non-land-based activities and seeking to redress inequities in the present programme it is hoped that this will encourage the involvement of women in the watershed programme, especially by taking account of their needs and interests (food crops versus cash crops, fruit trees versus timber, water for drinking versus water for irrigation, etc.).

This, as Bebbington (1999) advocates in his discussion of the need to look at wider 'rural livelihoods' rather than just 'agrarian livelihoods' implies changing the way the watershed programme is viewed, *"looking less at agriculture per se and instead focusing attention on the types of resource, institutional sphere and market type that families have accessed in the course of composing sustainable, non-agricultural rural livelihoods."*

Actions that need to be taken to strengthen the participation of women in the watershed programme:

- Equal representation with men on various committees dealing with watershed development;
- Equal wages in construction and other work;
- Technical and social support so that they can fully play their role in watershed development (including help with child care);
- Capacity-building of women to enhance their negotiating and leadership skills;
- Sensitising government and NGO officers to women's roles and needs;
- Establishing monitoring systems to assess how women's interests are being defended.
- Involve women users during planning process of watershed development.

Following issues that need to be addressed under watershed programmes:

- Create social space for women in public fora and help them increase their confidence and capacity to participate effectively.
- Encourage the linkages between women's self-help groups and watershed associations where women representatives from the self-help groups who sit on watershed committees will represent the views of their groups, and have the backing of the group members.
- Shift attention from the current emphasis on the numbers of women participating in self-help groups, or amounts saved, in separate schemes for women, towards identifying and addressing strategic gender interests in 'mainstream' schemes in rural development, where the bulk of funding is directed.
- Innovate with participatory approaches which allow different groups of women (and men) to have a voice in planning processes (such as separate focus groups for micro-planning for marginalised groups).
- Support projects and programmes which look beyond land development to 'rural livelihoods' in general, which take into account the diverse ways in which rural people make their livelihoods from both agrarian and non-agrarian based income-generating activities.

Allocate more time and resources are assigned to the development of the participatory skills of both implementing agencies and communities and greater provision is made for investment in non-land based and land-based activities which are attractive to, and lucrative for women, then there is a greater chance that women will be seen as valued and equal members of the village community developing the watershed. It may also mean that they will see value in investing their time in watershed/livelihood development programmes and projects. This would imply investing more resources in human and social capital rather than just 'produced' or natural capital. Strong budgetary support for such activities in the Guidelines would provide a platform from which to mainstream the experience learnt from the many small initiatives being tried by NGOs and some government officials.

The empowerment of women through activities that bring them sustainable economic independence and provide them with a 'voice' can help to shift the socio-economic, cultural and political norms which prevent the effective implementation of legislation which supports their right to land and property and the status that goes with those rights.

There is a need to ensure that women do not become overwhelmed by schemes and programmes focused *at* them and are not persuaded to participate simply for short-term incentives (wage labour), but are able to make informed choices about what is best for them and their families. That remains the big challenge.

Source: IIED – Gatekeeper series No.SA92 women participation in watershed development in India by Janet Seeley, Meenakshi Batra and Madhu Sarin (2002)

6. VIRTUAL WATER APPROACH FOR IMPROVED WATER AWARENESS

Introduction

Next to air, the other important requirement for human life to exist is water. It is the Nature's free gift to human race. The use of water by man, plants and animals is universal. As a matter of fact every living soul requires water for its survival. The water plays important role in the agriculture, manufacture of essential commodities, generation of electricity, transportation, recreation, industrial activities, etc. The water can certainly inexhaustible gift of nature. But to ensure their services for all the time to come, it becomes necessary to maintain, conserve and use these resources very carefully in every sphere of life. When you know that nothing on Earth can live without freshwater, that a human can't survive after three days without it, you see how precious this resource is – and how much we need to protect it.

Limited Fresh Water

Although water is the most widely occurring substance on Earth, only 2.53% of it is fresh water. The remaining 97.47% is saltwater. Of the small amount of freshwater, only one third is easily available for human consumption, the large majority being locked up in glaciers and snow cover

Water Crisis

Of all the social and national crises we face today, the water crisis is the one that lies at the heart of our survival, and that of our planet earth. As all different modes of water use have continued to increase, many countries, especially those located in arid and semi arid regions have started to face crises, although the magnitude, intensity and extent of the crisis could vary from country to another or even within the same country, and also over time. Not surprisingly, the responses of individual countries, or even states or provinces within a large country, to reduce the impacts of that crisis could vary as well. There are many, often interrelated, factors that could make the water crisis more pervasive in different parts of the world in the coming years.

Increasing population and higher levels of human activities, including effluent disposals to surface and groundwater sources, have made sustainable management of water resources a very complex task throughout the world. In addition, per capita demand for water in most countries is steadily increasing as more and more people achieve higher standards of living



and as lifestyles are changing rapidly. Table 1 shows the population growth, annual renewable freshwater available and per capita availability for selected countries (Biswas, 1998).

Table 1. Population and per capita water availability for selected countries

Country	Population, Millions			Fresh water, km ³	Per capita fresh water, 1000 m ³		
	1994	2025	2050		1994	2025	2050
Brazil	150.1	230.3	264.3	6950	46.30	30.18	26.30
Canada	29.1	38.3	39.9	2901	99.69	75.74	72.70
China	1190.9	1526.1	1606.0	2800	2.35	1.83	1.74
Indonesia	189.9	275.6	318.8	2530	13.32	9.17	7.94
USA	260.6	331.2	349.0	2478	9.51	7.48	7.10
Bangladesh	117.8	196.1	238.5	2357	20.00	12.02	9.88
India	913.6	1392.1	1639.1	2085	2.28	1.50	1.27
Argentina	34.2	46.1	53.1	994	29.06	21.56	18.71
Japan	124.8	121.6	110.0	547	4.38	4.50	4.97
Turkey	60.8	90.9	106.3	203	3.34	2.23	1.91
UK	58.1	61.5	61.6	120	2.07	1.95	1.95
Egypt	57.6	97.3	117.4	59	1.02	0.60	0.50

India, with 2085 km³ of renewable water resources stands 7th in the world, but due to its huge population over 1 billion, it attained 133rd position in terms of per capita availability of water.

Water Scarcity

UNESCO has defined water scarcity based on the per capita availability of usable water as

- Below 1700 m³ per capita/year : **Water scarce**
- Less than 1000 m³ per capita/year : **Severely water scarce**

When country's renewable water supplies drop below about 1700 cubic meters per capita, it becomes difficult for that country to mobilize enough water to satisfy all the food, household, and industrial needs of its population. Countries in this situation typically begin to import grain, reserving their water for household and industrial uses. At present, 34 countries in Asia, Africa, and Middle East are classified as water stressed, and all but two of them-South Africa and Syria are net importers of grain. Collectively, these water stressed countries import nearly 50 million tons of grain a year. By 2025, the number of people living in water

stressed countries is projected to climb from 470 million to 3 billion- more than six fold increase.

Water Usage

Water is intrinsic to our lives and to the ecosystems on which we all depend. Water is essential to life in every way, we need clean water for drinking, adequate water for sanitation and hygiene, sufficient water for food and industrial production, and much of our energy generation relies on or affects water supplies. Demographic and urban growth over the next century will mean a far greater demand for water for industrial production. Competition between users, and sectors, is therefore becoming increasingly important (Table 3). World's water usage pattern in the previous century, which is growing at alarming rate, is shown in Fig 1.

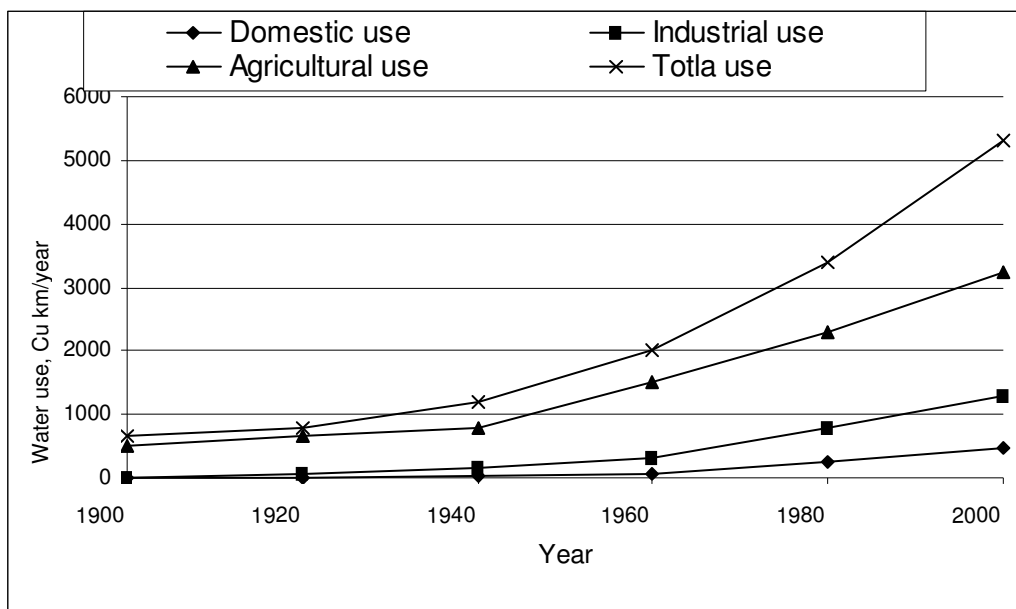


Fig.1 World's water use pattern in 20th century

Table 2. Comparison of water usage in different sectors

Usage in (%)	World	Europe	Africa	India
Agriculture	69	33	88	82
Industry & others	23	54	5	12
Domestic use	8	13	7	6

Water for Agriculture

Almost 70% of all available freshwater is used for agriculture (Table 3). Over pumping of groundwater by the world's farmers exceeds natural replenishment by at least 160 billion cubic meters a year. It takes an enormous amount of water to produce crops: three cubic



meters to yield just one kilo of rice, and 1,000 tons of water to produce just one ton of grain. Land in agricultural use has increased by 12% since the 1960s to about 1.5 billion hectares. Current global water withdrawals for irrigation are estimated at about 2,000 to 2,555 km³ per year.

For the last half-century, agriculture's principal challenge has been raising land productivity-getting more crops out of each hectare of land. As we have stepped into the twenty first century, the new frontier is boosting water productivity getting more from every liter of water devoted to crop production. More than half of the water removed from rivers and aquifers for irrigated agriculture never benefits a crop. Because water performs many functions as it travels through the landscape toward the sea, however, it is important to think systematically about where water goes once it comes under human management.

There is long and growing list of measures that can increase agricultural water productivity. The key is to custom design strategies to fit the farming culture, climate, hydrology, crop choice, water use pattern, environmental conditions, and other characteristics of each particular area.

Drip irrigation ranks near the top of measures with substantial untapped potential. In contrast to a flooded field, which allows a large share of water to evaporate without benefiting a crop, drip irrigation results in negligible evaporation losses. When combined with soil moisture monitoring or other ways of assessing crop's water needs accurately, drip irrigation can achieve efficiencies as high as 95 percent, compared with 50-70 percent for more conventional flood or furrow irrigation.

Water Footprint

Water Footprint is quite simply the volume of water used. At the individual level, this is expressed in litres. But at the national level, this becomes complex - The water footprint of a nation is equal to the use of domestic water resources, minus the virtual water export flows, plus the virtual water import flows.

The total 'water footprint' of a nation is a useful indicator of a nation's call on the global water resources. The water footprint of a nation is related to dietary habits of people. High consumption of meat brings along a large water footprint. Also the more food originates from irrigated land, the larger is the water footprint. Finally, nations in warm climate zones have relatively high water consumption for their domestic food production resulting in a larger water footprint. At an individual level, it is useful to show the footprint as a function of food diet and consumption patterns.

Virtual Water

The concept of virtual water links a large range of sectors and issues that revolve around relieving pressures on water resources, ensuring food security, developing global and regional water markets.

The concept of virtual water emerged in the early 1990s and was first defined by Professor J.A. Allan as the water embedded in commodities. Producing goods and services requires water; the water used to produce agricultural or industrial products is called the virtual water of the product.

Virtual water is an essential tool in calculating the real water use of a country, or its water footprint, which is equal to the total domestic use, plus the virtual water import, minus the virtual water export of a country. A nation's water footprint is a useful indicator of the demand it places on global water resources. By importing virtual water, water poor countries can relieve the pressure on their domestic water resources.

At the individual level, the water footprint is equal to the total virtual water content of all products consumed. A meat diet implies a much larger water footprint than a vegetarian one, at an average of 4,000 liters of water per day versus 1,500. Being aware of our individual water footprint can help us use water more carefully. Virtual water of some of the important products is shown in the Table 3.

Table 3. Virtual water of some important products

Commodity	Virtual water
1 cup of coffee	140 liters
1 liter of milk	800 liters
1 kg maize	900 liters
1 kg of wheat	1100 liters
1 kg of rice	3000 liters
1 kg sugar	3200 liters
1 kg chicken	6000 liters
1kg beef	16000 liters

Adopting a virtual water strategy: a solution for water-poor countries?

Some experts argue that the importing of virtual water (via food or industrial products) can be a valuable solution to water scarcity, especially for arid countries that depend on irrigation to grow low-value food with high water needs.

For example, growing one tonne of grain or wheat requires about 1,000 m³ of water; growing the same amount of rice requires up to thrice as much. The value of the water used for producing these food staples in water-poor countries turns out to be many times higher than the value of the product. Thus, instead of using their scarce water resources for water-intensive products, such countries can import cheap food, and relieve the pressure on their own water resources. Already a number of countries, such as Israel and Jordan, have formulated policies to reduce export of water-intensive products. Currently, 60 to 90% of Jordan's domestic water is imported through virtual water. Still, some countries are afraid of becoming dependent on global trade – those with large populations, for example, such as China or India. What would happen if, for some reason, their food demands could not be met? This explains why they are trying, as far as possible, to fill their own food needs.

Threatened water resources in countries with net water export

In a world experiencing great population growth and ever increasing water use, our concern about the future is very understandable. Global trends are not optimistic, and show increasing environmental, social, and economic difficulties as a result of the many competing pressures on our natural resources.

The main pressures

During the past century, the world population has tripled, and water use has increased six-fold. These changes have come at great environmental cost: half the wetlands have disappeared during the 20th century, some rivers don't reach the sea anymore, and 20% of freshwater fish are endangered.

The main reasons affecting availability of water are a) Geopolitical changes, b) Population growth, c) Agricultural demand, d) Energy requirements, e) Urbanization, f) Economic growth and industry, g) Globalization, h) Technological changes i) Lifestyle, j) Recreation and tourism, k) Climate change.

International Conference on Water and Environment (ICWE) held in Ireland in 1992 has made the following recommendations (Dublin Principles) indicating the importance of water for sustainable development.

1. Freshwater is a finite vulnerable resource, essential to sustain life, development and environment
2. Water development and management should be based on a participatory approach involving users, planners and policy makers at all levels
3. Women play a central part in the provision, management and safeguarding of water.



4. Water has an economic value in all its competing uses and should be recognized as an economic good.

Conclusions

The world and more importantly the developing countries are heading towards water stress and scarcity. They are left with no alternative but to adopt modern irrigation technologies, which save water, double the area under irrigation, improve yields and quality as well as save on labour, energy and crop production costs. In India more than 82% of the total water is used for agriculture with very low irrigation efficiencies. It is expected that in the next 7-8 years, there will be cut of about 10% irrigation water for meeting ever-increasing demand from domestic, industrial and other sectors. Hence, there is necessity to adopt water saving production technologies and also undertake large-scale micro irrigation projects like Andhra Pradesh Micro Irrigation Project (APMIP) to bring more areas under micro irrigation systems improving water use efficiencies to as high as 95%.

Source: Concept paper developed by Prof. K. Yella Reddy, FIE, Director (A&R), WALAMTARI, Hyderabad

PART : II

7. A SYSTEMATIC APPROACH TO TRAINING – TRAINING NEEDS ASSESSMENT

Introduction

The purpose of training is to improve / develop the abilities of an individual / group of individuals in order to improve their working efficiency in the current assignments entrusted to them / forthcoming assignments likely to be entrusted to them. Training alone does not stand on its own to improve performance.

Training is one of the arrows in a quiver, to target at improving the staff performance. The need for training essentially arises from one or an array of visible symptoms. These symptoms are like fall in the demand for the services provided or the products manufactured by the organization. There may be many more. Such symptoms are termed as problems in routine conversations. Most of the problems are consequences of performance gaps.

Dynamic organizations have shared goals. They quite often name their problems as concerns / challenges. Logical analysis of such problems/concerns/challenges provides us interesting clues to develop initiatives to resolve the problems. While analyzing further, the causes of the performance gaps are interestingly, not just limited to staff competencies alone. Many environmental and motivational factors do influence the staff performance besides their own competency gaps. Any quick conclusion to send staff for training to improve efficiency is bound to be a myopic decision resulting in wastage of resources. Consequently training, as a function becomes a mockery.

On the contrary there is a need to look for other arrows in the quiver, which can target at improving the environmental factors and creating conducive atmosphere. Conducive working atmosphere speaks volumes in motivating staff to invest their competencies in accomplishing a shared goal.

However, wherever the competency gaps become the major causes of low quality performance, of course training alone becomes one of the major remedies. Therefore any vibrant organization

depends on performance appraisals and training needs assessment (TNA) as one of the most important tool to satisfying its current and the future manpower needs in the organization.

What is a training need?

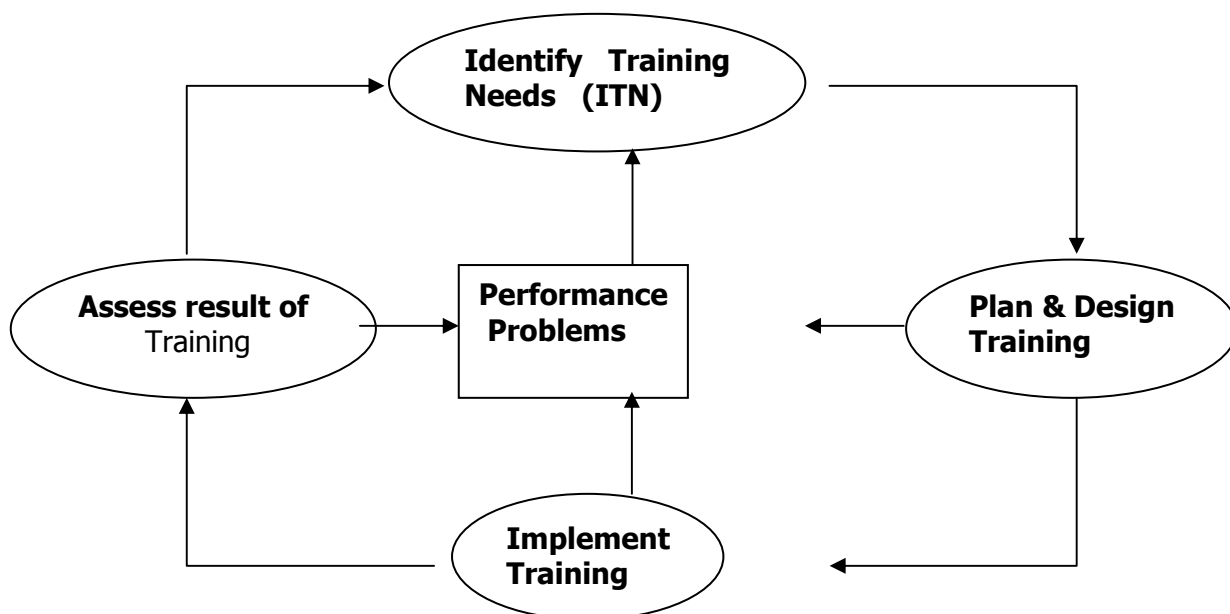
Training need is the performance gap that exists between the desired performance and the actual existing performance of an individual/ group of individuals/ organization.

It can be defined as:

“A training need is the gap that exists between the required and the actual existing standards of performance of an organization in the achievement of its goals and objectives. It is the performance gap of an individual in a task, which can be fulfilled by training”.

Therefore a systematic training approach demands identification of training need that becomes basis for planning and design of training, implementation of training and assessment of results. Lessons learnt from the assessment of results forms the basis for updating the training needs and identifying new training needs.

SAT Cycle (Systematic Approach in Training)



What happens if training is not based on the need!

- Training becomes haphazard
- Bad and good habits are passed on without recognition

- A substantial amount of time and resources are wasted
- Quality, efficiency, profitability, and credibility of training will be at danger
- Training system in the organization will be ridiculed.
- Absenteeism will be the primary symptom.

What is the difference between Training Needs Assessment (TNA) and Identification of Training Needs (ITN)?

Training Needs Assessment (TNA) gives an overall picture of the training required to perform a given array of duties and tasks. Most of the skill and knowledge gaps can be fulfilled at the work place and learning takes place from peer groups and guided practice by the immediate supervising officers. One should note that all performance gaps cannot be fulfilled by training alone. Therefore a further assessment of performance becomes imperative in order to develop a holistic approach where in formal training becomes a part of the whole approach.

Whereas Identification of Training needs (ITN) provides clues for training requirements that cannot be achieved through simple guided practices at the work spots either by the peers or immediate supervisors. Training requirements which cannot be addressed locally, needs to be addressed differently by applying suitable strategies based on a detailed analysis.

Why to Assess Training Needs?

Training involves tremendous use of resources like time, manpower, finances, material and many more. Training not addressing the needs and solving performance problems due to competency gaps drains the resources of the organization and the organization loses credibility in the market. Quite often the solution to the performance gap lies elsewhere and the organization wastes money and time on training which is obviously ineffectual. On the other hand if training could be identified as the right solution to fulfill the performance gaps it is necessary to further identify what kind of training etc. TNA serves as an important tool

- To review the current and likely future operations of the employees and establishing authority and ownership by involving the employees.
- To establish priorities for actions
- To plan effective deployment of limited resources to ensure cost effectiveness of the training



- To provide basis for integrating training into the organization by involvement and there by getting commitment of the line managers.

Therefore it is necessary to diagnose the performance problem at various levels before concluding training as the only solution. It may be difficult to get vital data for analysis. TNA done by untrained personnel, who do not know the importance of TNA, may not precipitate tangible results.

What is the basis for TNA?

In the context of globalization any product has tremendous challenges for competing in the market. Quality and productivity, which in turn are evolutionary, form the essence of any enterprise. Therefore performance of the individuals and the organization become the primary focus for analysis.

- Goals of the organization
- Duties and tasks involved in achieving the organizational goals
- Working environment
- Skill behaviours and performance standards to accomplish the assigned tasks
- Performance gaps due to deficiencies in Attitude, Skill behaviours and Knowledge (ASK)

A thorough situation analysis in an organization duly considering the afore mentioned facts will help in identifying the performance problem.

What information is required to prepare effective TNA report?

- ❑ The context and the preferences of the organization
- ❑ Job descriptions
- ❑ The standards of performance and specification of the products
- ❑ Performance reports (departmental/sections)
- ❑ Size of the target group
- ❑ The complexity of the work role
- ❑ Time constraint
- ❑ Personal records
- ❑ Tools and implements available for workers

- ❑ Perceptions of the employees, supervisors and the management about the causes of performance problems

Approach to TNA

- ❑ Scanning the available information within the given mandate
- ❑ Identifying the performance problems
- ❑ Observations at place of work
- ❑ Interviews with employees and supervisors
- ❑ Reviewing duty and task statements as stipulated by management
- ❑ Review of duties and tasks as performed by the target groups
- ❑ Self-assessment
- ❑ Analyzing the given case studies

Processes used in TNA

- ❑ DACUM process to review duties and tasks
- ❑ Focal group discussions.
- ❑ Observing people at work with appropriate checklists

Whose job is TNA/ITN

Individual in any organization either singly or in teams/groups work under the supervision of supervising officer called by different names. Such supervisors have direct access to keep track of performance of the staffs. Next to supervisors clients form another group of important feedback providers. HRD and training managers are specialized group of individuals who have process skills in identifying training needs. However HRD and training managers do not have direct access to the performing individuals. Therefore it is essential to have a multidisciplinary approach to TNA/ITN where in the immediate supervisors, divisional and district administrative heads have to shoulder the responsibility and the training and HR managers facilitate the processes of identifying training needs and plan to implement training. Furthermore the supervisors, divisional and district administrators shoulder responsibility for transfer of learning and providing feedback from clients and their own feedback to the training institutions. Thus the



systematic forward and backward linkages need to be enabled in order render training purposeful.

With respect to farmers training needs:

Discuss with farmers in-groups (focal group discussions) and analyze the practices they are following for any operations.

Such operations could be any one as enumerated

- ❖ Participatory methodology
- ❖ Construction of field bunds
- ❖ Seed and land treatment for a given sowing
- ❖ Harvesting methods of a given crop
- ❖ Inter cultivation practices to improve livestock feeding
- ❖ Keeping animal houses clean and hygienic
- ❖ Preparing cottage paneer etc

Procedure to identify the training need

- If introducing a new package of practices identify the learning requirements to adopt the new package
- To enhance performance through an existing practice observe the farmers at work and identify the gaps in the prescribed practices
- If the farmers demand a given skill in any of the operations or practices identify the learning objectives from the available standards
- Discuss with farmers on the procedures they are following to practice any task
- Identify the learning objective to fulfill the gaps.
