



# **SHARED CONTROL OF NATURAL RESOURCES (SCOR)**

**SCOR WORK PLAN  
(1993-1995)**

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SCOR seeks to increase the users' share of control of natural resources in selected watersheds through partnerships between the state and users that contribute to greater production while conserving the natural resources base. SCOR will promote integrated planning for the use of land and water resources in two pilot watersheds with spread effects to other areas. The SCOR project is a collaborative effort of the Government of Sri Lanka, the United States Agency for International Development (USAID) and the IIMI.

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# **SHARED CONTROL OF NATURAL RESOURCES (SCOR)**

## **SCOR WORK PLAN FOR**

### **HURULUWEWA AND NILWALA WATERSHEDS (1993-1995)**

#### **1. INTRODUCTION**

##### **1.1 Purpose**

This document presents the draft work plan of the 'Shared Control of Natural Resources (SCOR)' Project. It presents and describes the: rationale for selection of micro watersheds for SCOR interventions; the basis for selection of specific themes, intervention areas and activities; the approach for planning and implementation of project activities; draft work plans for Huruluwewa and Nilwala watersheds; research topics proposed to be conducted; and indicators suggested for M&E of the project impact.

##### **1.2 SCOR Project**

The goal of SCOR is to increase the sustainable productivity of the natural resources base in Sri Lanka in ways that will improve people's livelihood beneficially and equitably now and in the future with due regard for the environment. To achieve this goal, the project seeks to increase the user's share of control of natural resources in selected watersheds through partnerships between the state and users that contribute to greater production while conserving the natural resources base. SCOR will promote integrated planning in the use of land and water resources. See annex 6 and 7 for Logical framework and organization chart.

The Project is implemented in two phases over six years in the two pilot watersheds, i.e., Huruluwewa (Upper yanoya) watershed in the North Central Province (NCP) and Upper Nilwala watershed in the Southern Province (SP), covering a total area about 30,000 ha. Maps showing the two watersheds are in map 1 and 2.

##### **1.3 Approach for planning and implementation**

SCOR is the first project based on watershed principle ever to be implemented in Sri Lanka. It has been designed through intensive participatory interaction between resource users, provincial and field level officials, selected local consultants of relevant disciplines, facilitated by a design team from IIMI.

The work plans presented herewith have been developed by the two resident SCOR teams, on the basis of the simulation planning exercises carried out during the planning workshops held between 23 September to 16 October, subsequent consultations with the people and the field level agency officials, and intensive field verifications.

SCOR activities are facilitated by IIMI through a multi-disciplinary team of professionals placed in the watershed. The team facilitates the planning and implementation of specific project activities by the resources users, relevant state agencies and NGOs in the selected geographic areas within the micro watersheds. It is under the direction of Water Resources Management Team (WRMT) established at field level and the Provincial Steering Committee (PSC) at provincial level. SCOR will follow a learning process approach in the planning and implementation of the project.

The subsequent part of this note presents descriptions for Huruluwewa and Upper Nilwala watersheds, separately.

## **2. HURULUWEWA WATERSHED**

### **2.1 Watershed area**

For purpose of SCOR, Huruluwewa watershed is defined as the area covered by the catchment of Huruluwewa tank up to Habarana wewa, water-spread area of Huruluwewa reservoir, and the area between Huruluwewa dam to the point of confluence of Adappan Oya with Yan Oya. The latter area includes the command area under Huruluwewa reservoir, highlands, and drainage area. The watershed consists of Yan Oya and Huruluwewa irrigation system and, a large number of minor tanks. It is actually the upper part of Yan Oya watershed. It falls within the Divisional Secretariat areas of Galenbindunuwewa, Palugaswewa, Kekirawa and Horowpatana. The total area covered is about 47,700 ha. The area covered by Huruluwewa watershed is shown in map 1.

The important present land uses are chena, irrigated agriculture, forests, homestead and degraded areas. The main problems are lack of water in the Yala and weak management in Maha, degradation of the resource base and unorganized resource users.

### **2.2 Geographical areas of work**

A few tank cascade systems and micro-watersheds within the main Huruluwewa watershed have been identified for intervention in the initial two years. These specific areas have been initially identified by the Land Use Policy Planning Division (LUPPD) of the Ministry of Lands, on the basis of scientific studies undertaken by them in the watersheds.

The main geographic areas identified for the implementation of SCOR activities in Huruluwewa are listed below:

1. Meegaswewa subwatershed
2. Mahadivulwewa subwatershed

3. Kiulekadawewa subwatershed
4. Drainage area of Huruluwewa irrigation system from Nikawewa upto Ilukwewa anicut.
5. Huruluwewa command area
6. Tract 6 area of Huruluwewa including homesteads.

In addition to the above six areas, the Mahaweli feeder canal from Lenadora to Habaranawewa has been included as a special area of intervention by the SCOR.

It should be noted that some interventions such as integrated planning and coordination will not be confined to any geographic area, but will spread over the entire watershed and the province.

### **2.3. Themes for interventions**

During the planning workshops held from 22nd to 18th October at Anuradhapura, at which the SCOR team and other relevant officers participated, nine main themes and intervention areas were identified. Those were subsequently refined on the basis of field reconnaissance and discussions with field level agency officials, community based organizations, NGOs and individual users. The final themes culminated at the above efforts are listed below.

- a. Stabilization of chena and encroached state lands.
- b. Regeneration of tank eco-systems.
- c. Integrated water management in Huruluwewa watershed.
- d. Sharing resources for improving homesteads.
- e. Ground water development and management.
- f. Land consolidation in minor tanks.
- g. Integrated planning and coordination.
- h. Organizing user groups/user organizations/sub-user councils for production, protection and related services.
- i. Research with no interventions.

### **2.4 Rationale for selection of themes**

#### **a. Stabilization of chena and encroached state lands:**

In the Huruluwewa watershed, chena cultivation on both government and private lands is very high. Several hundreds of encroached areas are being turned over to the people under various programmes.

Forest lands in the watershed have already been degraded to an alarming level. The process of destruction of forest land will probably continue. Because of the rapid rate of

degradation of forests, drying up of water courses, dwindling of wildlife habitats and several other problems have already cropped up. The necessity to protect the existing forests and to increase reforestation of badly degraded lands have been stressed in several government policy documents.

**b. Regeneration of tank eco-systems**

The eco-systems of all the minor tanks and the Huruluwewa reservoir have been degraded badly over time. It is generally accepted that the destruction of tank eco-systems contributes substantially to the siltation of tanks and development of alkalinity, and affects the tank inflows. Its restoration is vital both from production and protection perspectives.

**c. Integrated water management in Huruluwewa watershed**

Huruluwewa is a water deficit area. Huruluwewa tank is supplemented by the diversions from Mahaweli system via Huruluwewa feeder canal, and its command by a number of minor tanks. A number of agro-wells too have been constructed in the watershed. Thus, shallow ground water is now available to augment the surface water sources.

However, a high degree of illicit water tapping is reported along the feeder canal from Mahaweli system to Huruluwewa tank. The efficiency of water use along the cascade of minor tanks en-route of Mahaweli water to Huruluwewa tank too is reported to be low. The augmentation of Huruluwewa system by the minor tanks situated in the periphery of the command too takes place without much planning and coordination. Drainage return flows from Huruluwewa irrigation system are tapped by the local people for cash crop production by lift irrigation. Utilization of ground water through agro-wells is carried out by farmers on individual basis. On the whole, there is no proper coordination between Mahaweli authorities, Agrarian Services Department, Provincial Irrigation Department, and the Irrigation department and individual users for the management of water for its optimum use. There is proven potential to improve the water use and management with the participation of the relevant agency officials and the users on a collective basis.

**d. Sharing resources for improving homesteads**

The capacity of the homesteads in generating food and employment has not been utilized satisfactorily. The homesteads should become the focus of integrated crop and livestock husbandry to facilitate continued income generation, food supply and employment. There has not been any programme focused on this important component of the farming system within this watershed.

**e. Ground water development and management**

A large number of agro-wells have been constructed in Huruluwewa watershed over the past few years by the government and individuals for irrigated agriculture. However, the ground water development through agro-well construction has been done without carrying out proper scientific studies. As a result, no accepted norms and regulations have been adopted for the construction of agro-wells.

While accepting the fact that the ground water can be effectively used for crop production and to supplement surface water in Huruluwewa command, the haphazard development and use of ground water will be detrimental to the long term sustainability of irrigated agriculture as well as to the environment. Signs of deteriorating water quality, falling water tables, and declining water yields from existing wells are beginning to appear. Thus, a study focusing on the proper development and management of ground water is very timely.

**f. Land consolidation in minor tanks.**

Consolidation of small and fragmented lands particularly under the minor irrigation systems is an important determinant of productivity in the dry zone. A few pilot interventions done in Sri Lanka provides evidence that consolidation of fragmented land holdings scattered over an irrigation command area of a minor tank, which are owned by a large number of farmers is practically possible with the willingness and participation of the land owners. In the present setting, land consolidation is crucial in improving efficiency of water use, productivity and total production.

**g. Organize groups for production, protection, marketing and related services:**

Increased production and improved protection require effective organizational mechanisms for sustainability. The lessons and experience in Sri Lanka and elsewhere adequately justify the need for organizing groups and linking the groups through proper coordinating arrangements such as organizations, committees and councils. Evidence from several pilot programmes conducted in the dry zone clearly shows that the basis for efficient use of resources has to come from organized groups. There is also high scope for providing services required for production and protection through organized groups.

Strengthening the existing user groups and formation of new user groups, organizations and user councils will enhance the production, productivity, incomes, equity and sustainability of production and related markets and services. Organization of groups is therefore the key to success in production, protection, marketing and other services in the watershed.

#### **h. Integrated planning and coordination**

It is noted that land and water resources management projects and activities are implemented by NGOs, CBOs and state agencies in the watershed. Planning of these interventions are done on an ad-hoc assessment of the resources base and resources potential, and analysis of production constraints. The role of resources users in planning is minimal. Also, specific projects and activities are implemented in isolation by various agencies and NGOs in their respective fields of specialization with little focus on the key problems affecting production, productivity and protection. More often the interventions and activities of projects come to a complete halt once the projects are withdrawn.

Much potential exists to strengthen integrated planning and coordination within the Divisional Secretary's division and the Province. SCOR can facilitate the development of data and information base, monitoring and evaluation systems and training of officials, NGOs and resource users on constraint analysis, rapid appraisal of problems and situations, self monitoring and evaluation of programmes etc. At the end, it is required to transform from the present 'project' mode to 'programme' in conceptualizing, planning, implementing, coordinating and evaluating specific development interventions in the watershed by line agencies, NGOs and resources users.

### **3. UPPER NILWALA WATERSHED**

#### **3.1 Watershed area**

The entire Nilwala watershed covers a total area of 146,280 ha. It comprises of the upper Nilwala watershed selected for initial interventions by SCOR, and the lower watershed, including the area falling under the Nilwala Ganaga Flood Protection and Drainage Scheme (NFPDS). SCOR will not have any interventions in the lower watershed, including the area covered by the NFPDS during the first phase. The area selected within the upper watersheds (micro watersheds) for SCOR interventions falls within the Divisional secretaries divisions of Kotapola, Pasgoda, Neluwa and Pitabeddra. However, SCOR activities during the first phase will be mainly within the first three DS divisions.

The main land and land use types within the upper watershed are protected forest, other state forests, highlands and homesteads covered with tea, paddy, rubber, coconut, kithul and fruit trees. Tea is the dominant agricultural crop. A significant area of the watershed is degraded.



### **3.2 Geographical area of work**

A few micro watersheds were initially identified by the Land Use Policy Planning Division (LUPPD) of the Ministry of Lands, on the basis of topography, ecology, land use, land tenure, production and marketing constraints, and the present status of environmental degradation, homesteads and resources users. A rapid appraisal of these micro watersheds was done by the SCOR team with the LUPPD team through field visits during the planning workshop. As a result, the following four micro watersheds have been selected for SCOR interventions and activities during the first phase.

1. Aninkanda
2. Diyadawa-Tenipita (Deniyaya)
3. Millewa
4. Horagala.

In addition, the interventions in relation to integrated planning and coordination will not be confined to the above geographic areas, but will spread over the entire watershed and the province. (See map 2)

### **3.3 Themes for SCOR interventions**

Five themes have been identified by the SCOR team for Upper Nilwala watershed on the basis of the consensus arrived at the planning workshop and through subsequent field reconnaissance and discussions with field level agency officials, community based organizations (CBOs), NGOs and individual resource users. In addition, SCOR will carry out selected research studies without any interventions. The themes embrace the five basic SCOR concepts identified as production, protection, shared control, watershed approach and focus on poverty. They are stated below.

- i. Sharing management of land and water resources.
- ii. Sharing resources for improving homesteads.
- iii. Improving tea/paddy culture.
- iv. Organizing groups for production, protection and related services.
- v. Integrated planning and coordination.
- vi. Research with no intervention

### **3.4 Rationale for selection of themes**

- i. **Sharing management of land and water resources:**

Distortion of river flows, as evident from increased flood peaks and reduced base flow distribution accompanied with severe erosion and loss of fertile soils, have become

characteristic phenomena in river Nilwala and other streams over few decades. There is consensus among the government officials, NGOs and the users of land and water resources that haphazard exploitation and use of lands including reserved forests, other state forests, large tea plantations and tea smallholdings, homesteads, river banks, stream and road reservations is largely responsible for this situation.

It is noted that encroachment of state lands in forests, river banks, stream/ road reservations for growing tea is common in the upper watershed. The remaining natural tropical forests too are subject to the threat of encroaching by people for the cultivation of tea. The gravity of the situation is evident from the fact that about 1500 acres of Diyadawa forest reserve had been encroached recently. The ignorance of farmers for the adoption of appropriate soil and moisture conservation in cultivated areas, particularly in encroached and private tea smallholdings, has aggravated the threat to land and water resources base.

In the past, the government agencies and NGOs implemented a number of reforestation and afforestation projects to combat the threat to resource base. In addition, they enforced law and order against encroachers of state lands and destructors of forests through the governmental regulatory mechanisms. All these efforts are proved to be not very effective because of lack of collective concern of the community and participation and support from the local people for those efforts. Also, production-oriented, income generating protection and conservation strategies that provide incentives for encroachers and farmers have been notably absent in those efforts. As a result, it is noted that the degree of encroachment, forest destruction, soil erosion, loss of fertility and drying of water courses continue to take place at an alarming level.

On the hand, there are complexities in tenure arrangements with regard to encroached lands. Some encroached lands have been given to the people, while others not. The formalities including land survey work in respect of some lands have not yet been finalized. The protection and conservation of lands alienated to people remain to be a serious problem.

Time is, therefore, opportune to adopt an innovative approach to motivate and mobilize local people to protect the lands in upper watershed. The participation of the local people has to be obtained on collective basis, while the conservation efforts have to be rewarded through the introduction of conservation techniques and strategies that will generate financial gains and new land use and tenure arrangements that will guarantee the access and acquisition of the benefits of conservation by the people.

## **ii. Sharing resources for improving homesteads:**

Homestead is a key mosaic of the upper watershed. Tea plants have replaced many traditional food crops in homesteads, particularly after the increased price for tea in early 1980s. Thus, tea plantation constitute a greater part of homesteads as well as the upper

watershed. Although, it is true that the people derive satisfactory incomes from homesteads, further economic benefits can be obtained by harnessing the full production potential of the homesteads. This production base can be intensified through the introduction of fruit crops, livestock husbandry, and other avenues such as apiculture, floriculture growing, horticultural plants and medicinal herbs, which will bring additional financial benefits to the smallholder. However, in the past, no programmes have focused on integrated homestead development. SCOR could act the catalysing and facilitating role to the NGOs, private sector and the relevant line agencies to: promote new production and related value-adding opportunities in the homesteads; organize activity based user groups and organizations; and establish markets and other service links for primary and value-added products.

### **iii. Improve Tea-paddy culture:**

The cross-section of the watershed can be typically characterized as tea-paddy culture, which is analogous to typical paddy-chena culture in the dry zone. However, it is reported that, except in privately managed tea plantations, tea and paddy yields in smallholdings are far below than the potential.

Typically, many tea smallholder do not adopt proper agronomic practices and soil and moisture conservation measures. It is also noted that a prolonged period of dryness prevails during early months of the year, resulting in yield reduction of tea and substantial plant casualties due to soil-moisture stress. There is potential for minimizing yield reductions and losses by introducing proper agronomic practices and soil and moisture conservation measures to tea small holdings. SCOR can play a key role in facilitating this task. Testing the technical feasibility and economics of supplementary irrigation of tea is another possible area of intervention.

Status of both irrigated and rain-fed paddy cultivation too is not very satisfactory. The best use of paddy lands and available water is greatly hindered by fragmentation of paddy allotments, poor condition of irrigation facilities due to neglected maintenance, and low preference to paddy cultivation by farmers due to high economic returns from tea growing. SCOR can intervene in motivating and mobilizing farmers through organized groups to rehabilitate and maintain irrigation facilities by sharing capital investments. The land productivity can be increased by consolidating fragmented lands of minor irrigation schemes. There is potential to integrate latter intervention with the on-going World Bank funded National Irrigation Rehabilitation Project (NIRP).

### **iv. Organizing groups for production, protection and related services.**

Same as sub-section (g) of section 2 above.

**v. Integrated planning and coordination.**

Same as sub-section (h) of section 2 above.

**4. MODE OF IMPLEMENTATION**

A number of activities emanate from different interventions identified under the main themes as described in the previous sections. The themes, intervention areas and activities proposed for Huruluwewa and Nilwala watershed are presented in work plans given in sections 3 and 4 respectively.

Those activities will spread out in geographic space at different locations depending on the production and protection needs demanded by specific ecological, socio-economic and environmental requirements at those locations. For example, for the proposed activities under the theme of 'regeneration of tank ecosystems', focus will be on the foreshore (Gasgommana), Perahana and Kattakaduwa, while for those under 'establishing chenas in tank catchments', the activities will be distributed in a larger area of the catchment of a cascade system. Also, the activities for the preservation and conservation of road, river and stream reservations will be carried out along the strips of selected reservations, thereby cutting across sub-locations in the sub-watershed. There are many sub-locations where such activities could be implemented.

In view of the need to produce the expected output during the two year first phase of the SCOR project, an appropriate mode of implementation was articulated to have focus on two contiguous areas, one each in the two pilot watersheds. The selected contiguous areas are sub-watersheds of manageable size within the main watershed, having characteristic profiles of ecological, socio-economic and environmental features similar to that of the respective main watersheds. Action will be taken to demonstrate as much activities as appropriate representing different themes in one contiguous block. The full coverage of the land space of this sub-watershed will be attempted with the appropriate themes, interventions and activities as much as possible to form a model that will demonstrate the elements of replication in a much larger area during the second phase. This 'contiguous area' or 'model watershed' approach of implementation would illustrate the various production-protection elements along with their intimate relationships, that will have to be incorporated in watershed management in order to produce a sustainable land and water resources base.

This mode of operation with a contiguous area focus will facilitate a convenient geographical base for monitoring of the land and water resources management processes and activities, and evaluating their outputs and effects leading to the anticipated impact.

The two selected contiguous areas are Meegaswewa cascade in Huruluwewa watershed and Ihala Millawa Ela in Nilwala watershed. While concentrating almost all the themes

and many interventions and activities on these subwatersheds, other subwatersheds will also continue to have interventions and activities on priority basis and at different intensities.

Figure 1 presents a sketch map of Meegaswewa cascade showing the two tanks, the catchment, paddy area and the homesteads, the terrain that slopes to Yan Oya. The emptiness depicts the need for conservation (protection) and production. Figure 2 depicts the future vision under the intervention of the SCOR project that aims to increase the sustainable productivity of these land and water resources.

Figure 1a presents the typical landscape profile of Hurulewewa watershed with a cascade system of two tanks. Figure 2a portrays the possible future for this landscape with SCOR intervention.

Figure 3 presents a profile of the landscape in the sub-watersheds identified for major focus in the Upper Nilwala Watershed. A brief account follows of the specific zones where intervention is considered necessary. (See Figure 4)

1. Hill tops and high slopes more than 35 degrees

These areas should be under the land cover category of dense forests with 50% 100% canopy cover. Most of these areas come under the control of the Forest department. Any encroachments will have to be removed with alternative solutions.

2. Secondary forests

This zone has many degraded areas that need a production oriented intervention. Agro-forestry practices with woody perennials and agricultural crops, tapping of available resources through user-state partnerships and conservation practices include the intervention.

3. Scrub and commercial cropping lands

This zone offers opportunities for increasing the productivity of land, improve conservation, organize existing commercial activities and initiate new commercial activities through user sub-grants, conservation farming and other appropriate interventions.

Fig: 1 A sketch of Meegaswewa Cascade Surface Conditions in Huruluwewa watershed for Meegaswewa Settlement

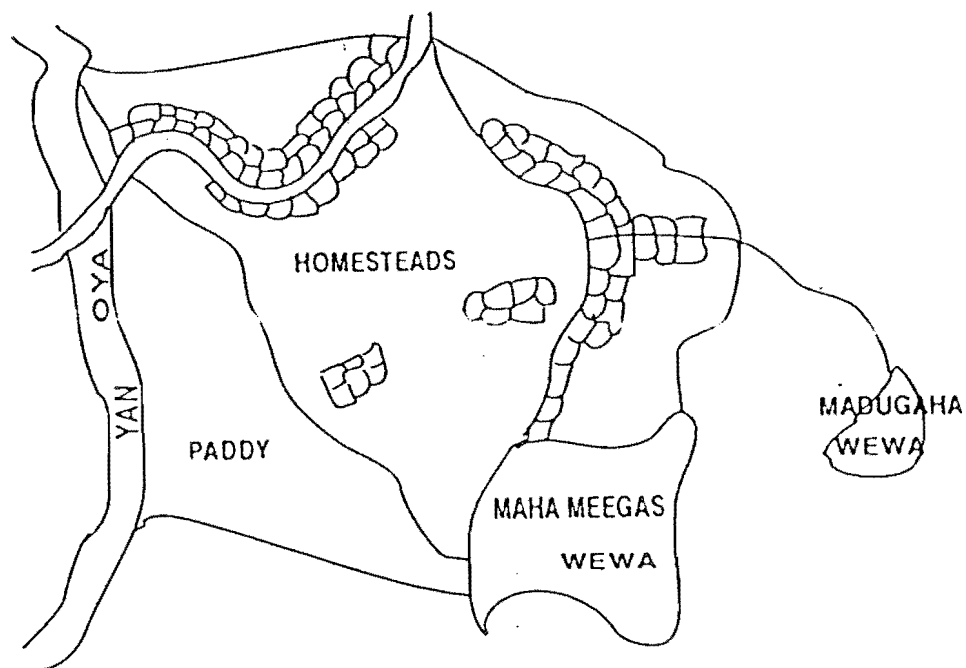


Fig: 2 A Possible Future Planned Under SCOR Intervention

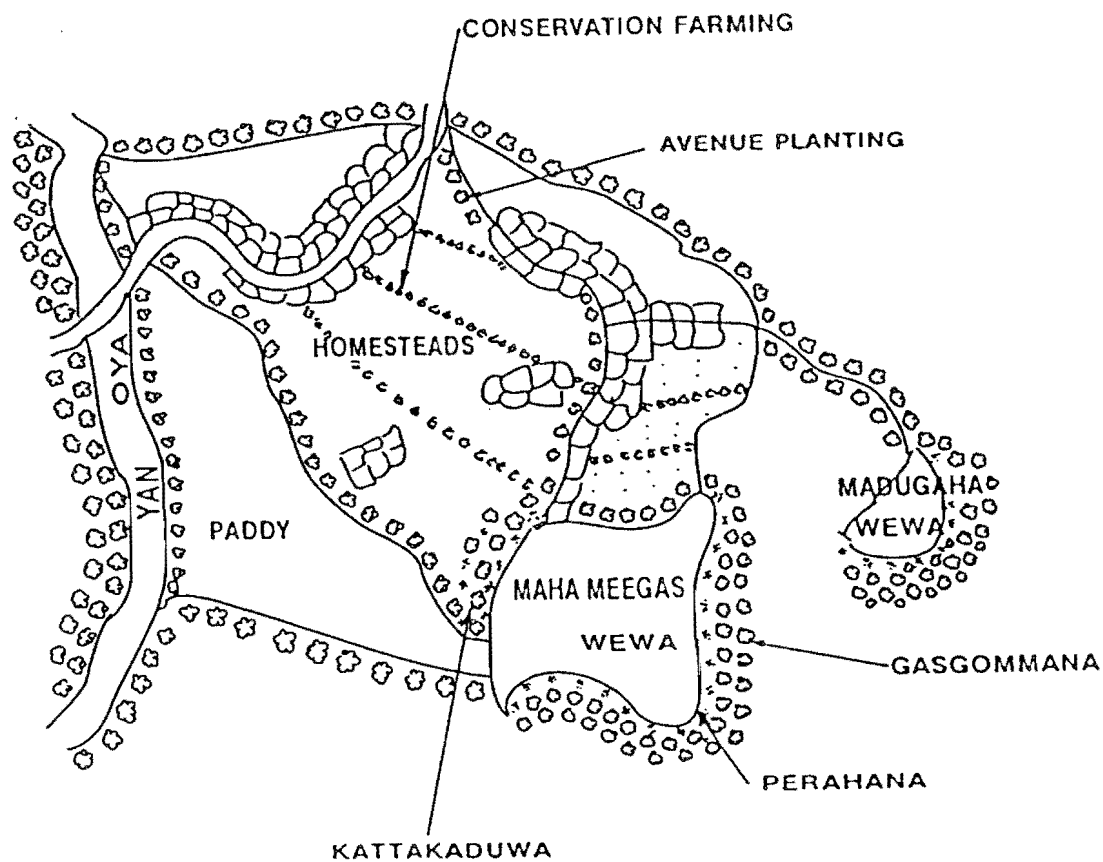


Fig: 1a Typical Landscape Profile - Huruluwewa Watershed

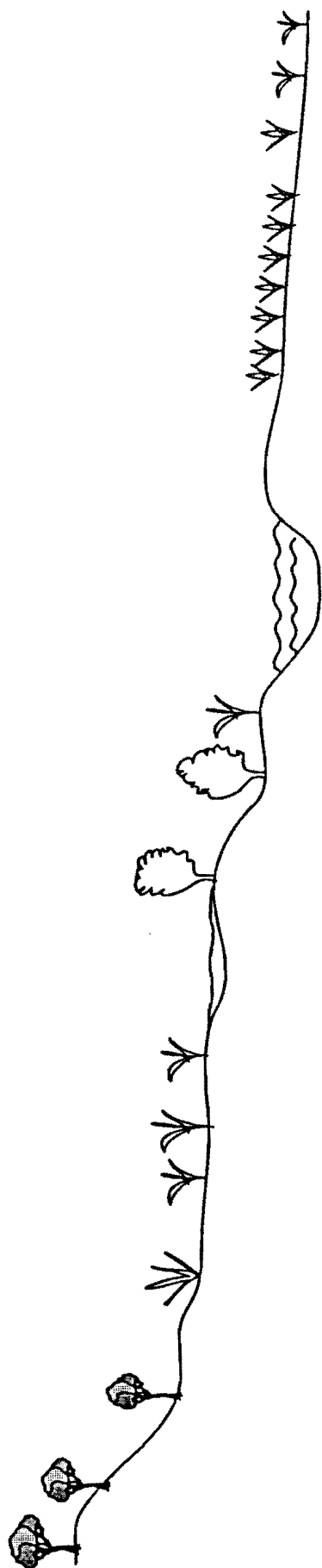
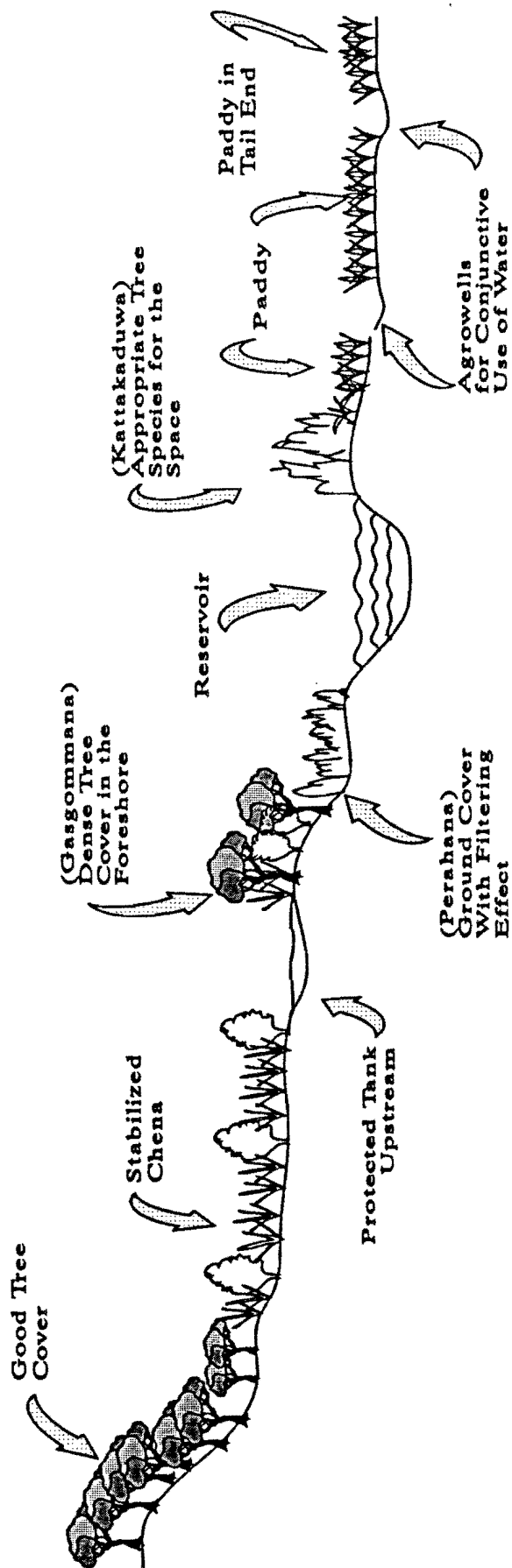
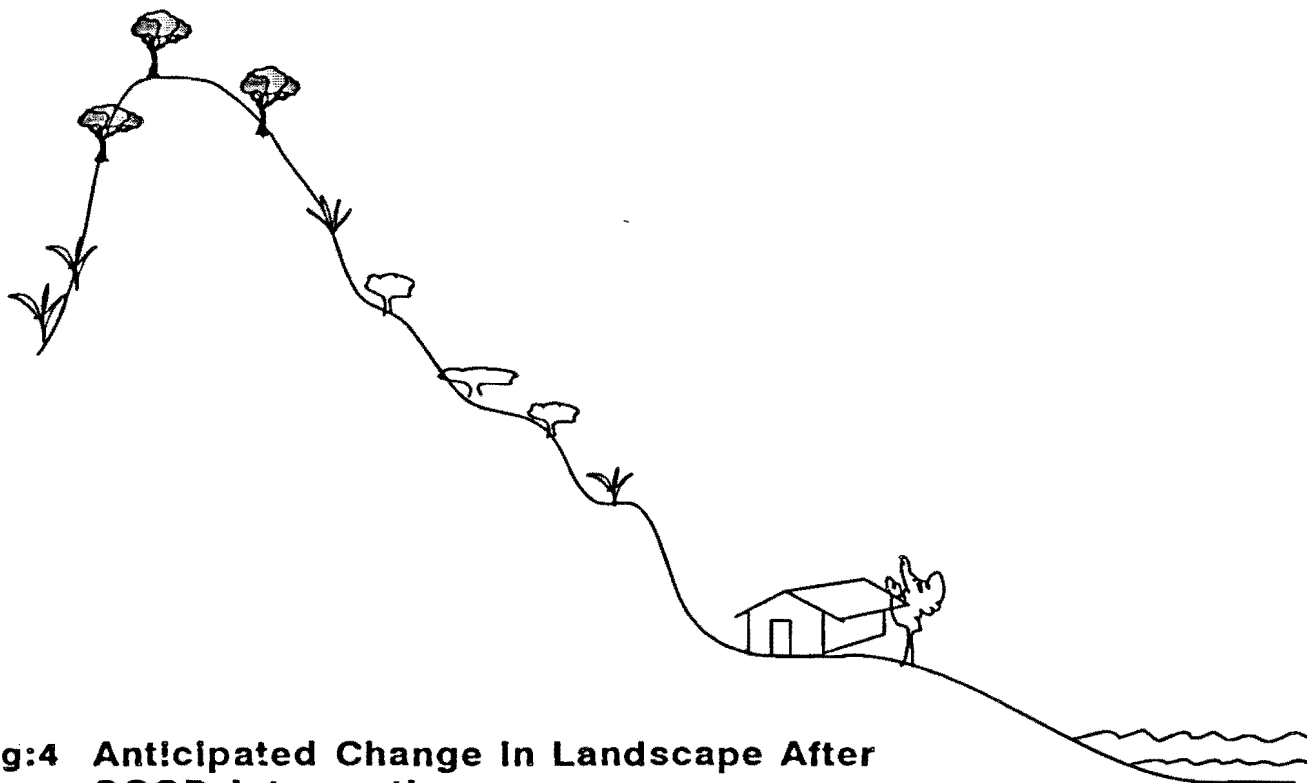


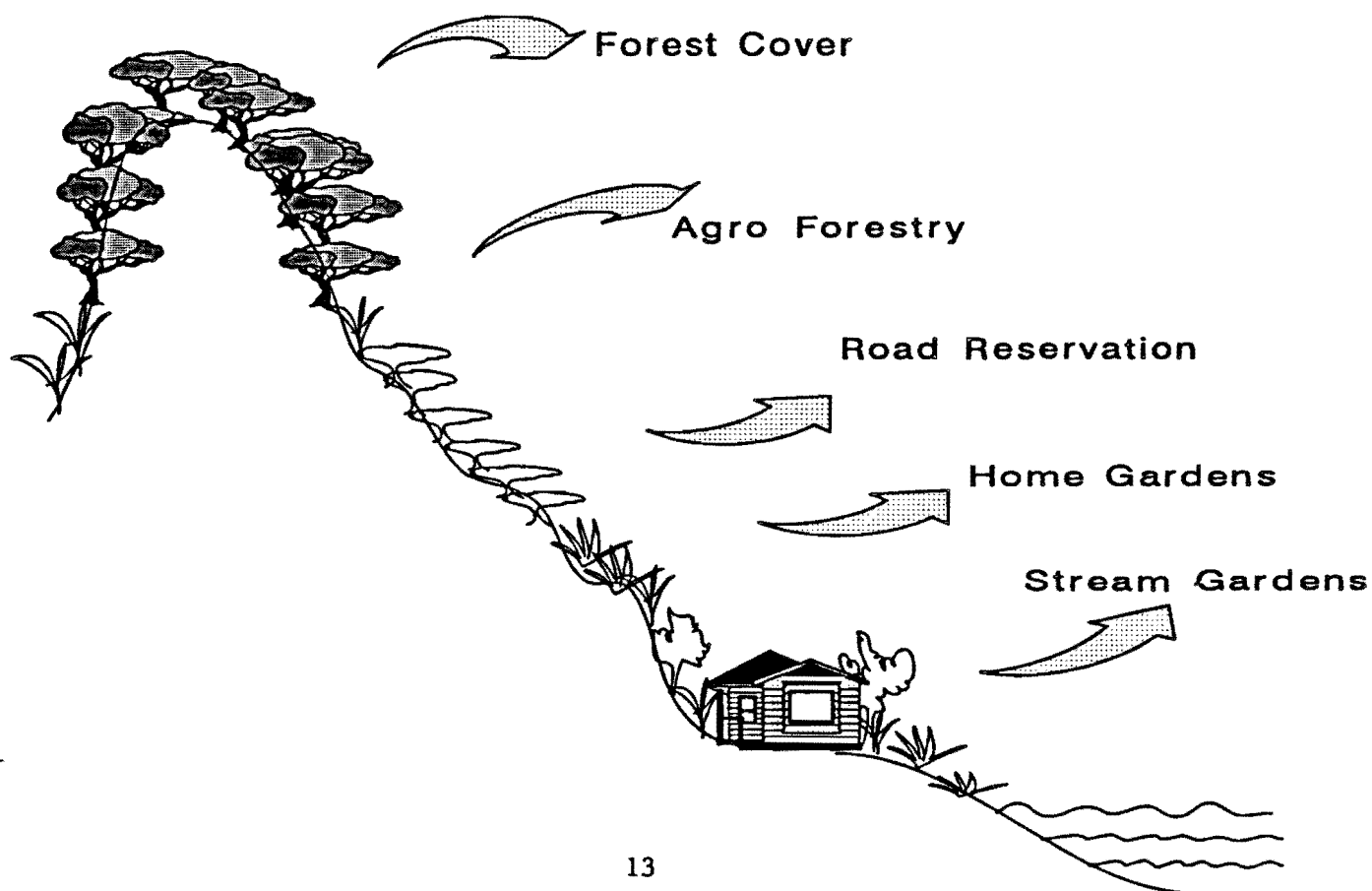
Fig: 2a SCOR Perception of a Possible Future



**Fig:3 A Typical Landscape Profile Calling for Intervention  
In Upper Nilwala Watershed**



**Fig:4 Anticipated Change In Landscape After  
SCOR Intervention**





#### 4. Homesteads

The main focus in this zone is on achieving maximum production and conservation in the homesteads allowing farm based as well as non-farm based activities.

#### 5. Road reservations

Road reservations offer a land space that need protection and production through sustainable means. Many of such locations add to heavy erosion narrowing the right of way threatening the road itself. Avenue planting combined with plant/grass cover and other plants of food/fodder value through user rights integrated with other activities such as animal husbandry are considered for intervention in this zone.

#### 6. Stream reservations

Stream density is one of the criteria used in the selection of the sub-watersheds in the Nilwala Watershed. It is a known fact that streams with stripped banks of their vegetative cover carry loads of top soil eroding from the exposed land areas creating siltation, flash floods and many other related problems in the downstream.

Field observations revealed the following existing conditions.

- (1) Parts of the stream banks are eroding with sliding chunks of soils to the stream changing the morphology of the stream.
- (2) Parts of the streams are under a crop by a user as an encroacher on his own or on an informal agreement with the owner/user of a larger land holding adjoining to the reservation.
- (3) Parts of the reservations are cropped by the user of the holding adjoining the reservation.

The intervention in this zone is stream gardens based on the need and wide scope identified for increasing protection with sustainable production of the land space of the stream reservations in the micro-watersheds. Area for the stream gardens will be mapped and allocated among users who will have the motivation to protect the existing trees and add new trees of productive value under the arrangement of usufruct rights to be granted to such users. Economic value of the current segment of the stream reservation and the total economic value of the stream gardens established will be computed.

Figure 4 presents a sketch of the same landscape appearing in figure 3, portraying the anticipated changes after carrying out the interventions described in the foregoing sections.

## **SUB GRANTS**

The SCOR Project will disburse US \$ 141,000 during the period of present co-operative agreement. There will be two types of such grants:

- (I) Sub-grants to individual users, user councils, People's companies, user organizations and user groups; and
- (II) Sub-grants to NGOs and Private Sector.

The purpose and disbursement criteria of such grants are described below.

### **I. Sub-Grants to Users**

Either the individual user or organized groups users will be eligible for SCOR project user grants. A vast majority of SCOR project grants, however, will go to organized user groups. The organized groups may include: user groups, user organizations, user councils/sub councils, people's companies aimed at production and protection etc. Such grants among other things will enable the group (or the individual) to:

- Show collateral when seeking additional loans through private financial institutions;
- Develop and promote insurance schemes for new crops, conservation schemes and investments;
- Construct storage facilities, markets, terraces, nurseries or other small physical infrastructure;
- Purchase equipment needed to initiate or upgrade joint enterprises to gain economies of scale and value added to their production.
- Join with other user groups to establish revolving funds for conservation of investments and/or the purchase of agricultural inputs; and
- Obtain legal, financial and other services associated with establishing user rights, small enterprises and productive ventures.

With resources user groups that have sufficient financial and technical capability as well as solidarity, the project will assist experiments with production companies, outgrower systems or other models of production organizations that can achieve economies of scale and greater value-added from production, e.g., through processing to enhance house hold

incomes and reduce demands placed on vulnerable natural resources. Such a mechanism will also act as an incentive for users to protect natural resources.

**Criteria & Procedures for Disbursement of Grant Funds:** The project's work plan for each of the two pilot watersheds has been prepared in consultation with the potential beneficiaries. Therefore the formation of new groups and/or strengthening of existing groups will be based on the activities included in the work plan. For example, there will be organized beneficiary groups for: "stream gardens" or agro-forestry or kitul processing etc. Such groups, with the assistance of IIMI-SCOR team and relevant agency officials will prepare detail activity plans. Ideally, such an activity plan will take the form of a feasible "mini-project" aimed of production and protection through shared control. The group will first conduct a self evaluation to check the feasibility and strength of such mini-projects and submit it to the respective user organization. After modifications (if necessary) and approval, the "mini-project" proposal will be submitted to the SCOR Project Team. After a participatory appraisal and depending on the magnitude of the "mini-project", the SCOR Team may submit the same to higher levels. As indicated below, the authorization process will depend on the magnitude of the grant component of the "mini-project":

<b>Financial limit</b>	<b>Authorizing institution</b>
a. Up to Rs. 25,000	SCOR project team in consultation with relevant resource user group.
b. Rs. 25,000-100,000	Watershed Resource management team.
c. Rs. 100,000-500,000	Provincial Steering Committee or WRMT in consultation with the Provincial co-ordinator.
d. Over Rs. 500,000	National Steering Committee or WRMT in consultation with the provincial and national co-ordinators.

The proposed arrangement for 'c' and 'd' above include the relevant steering committee or the WRMT and the national/ provincial co-ordinator. The co-ordinators are assigned with such authority because the PSC and NSC meetings are held once in three months and the work may suffer if the release of funds is delayed.

As much as possible the project's user sub-grant allocation will be granted directly to the user organizations/councils. The eligibility will depend on the strength of the organization and on the strength of the activity plans/mini projects of: a) user organizations; and b) user groups of that organization. In short, the project grants will only be given to strong mini-projects forwarded by the strong organizations. Such organizations (or groups within organizations) will share the cost of the "mini-projects".

The SCOR Project team will encourage the concerned organization to use the grant funding establish a revolving fund for production and protection activities of the organization. Such a revolving fund will help the organization to: borrow from a lending institution such as a commercial bank, to provide matching grants in the form of a fixed deposit scheme in favour of user groups to enable them to raise a loan from a lending institution against this deposit etc.

## II. Sub-Grants to NGOs & Private Sector

The Project will work with selected private sector entities and NGOs which are committed to protecting and developing natural resources in cooperation with communities. Such NGOs will be engaged to help establish user groups in the pilot areas, to carry out training and establish economic linkages and services for groups, to undertake land/production consolidation work, to establish peoples companies, to undertake monitoring and evaluation with user groups and communities to raise environmental consciousness, and to integrate such considerations into production planning and implementation.

By contracting with NGOs and private sector for such project related undertakings their skills and commitment for participatory natural resources management are expected to increase.

The criteria and procedures for disbursement of funds will be much similar to those of user grants. Annex 4 presents the criteria used in providing user grants.

## III. Proposed Disbursement Plan

	1994				1995			Total Rs. M
	1	2	3	4	1	2	4	
User Grants	0.2	0.4	0.5	1.0	1.8	1.1	1.0	6.0
NGO/PS Grants	0.05	0.10	0.15	0.2	0.20	0.20	0.15	1.05

## **5. MONITORING AND EVALUATION**

The monitoring and evaluation system (M&ES) of the SCOR project has been designed to reflect the project performance in respect of its use of inputs, generation of planned output, expected effects and anticipated impact. Such reflection is expected to help steer the project towards its declared goals. The broad Monitoring and Evaluation framework is presented in annex 1.

The M&ES is a part of the broad Management Information System (MIS) of the SCOR project. The four major functions viz. data capture and entry, store and retrieve, processing and analysis and display and report of SCOR MIS will facilitate the planning and implementation process of SCOR activities supported by a Geographic Information System (GIS).

SCOR M&ES is structured to collect information that would reflect and highlight any differences between

- (a) the targets, and the actual use of planned financial and physical resources inputs utilized to create the planned output,
- (b) the targets, and the actual direct outputs produced from those inputs,
- (c) the targets, and the expected effects that are observable in the short run as the outcome of the increased utilization of the produced output.
- (d) Change of certain processes and physical properties that are directly relevant to the generation of promised outputs, permitting monitoring with such a frequency to extract useful information for SCOR project interventions.

To accomplish the first task above, SCOR M&ES will use a financial monitoring system linked to its physical progress monitoring system. For the other tasks, the physical progress monitoring system will generate information from the field level up-wards. See Annex 8.

### **Physical progress monitoring system**

The physical progress is related to the performance of the activities of the work plans. The physical progress monitoring will take place at three levels in the SCOR project as follows.

- (1) Field level by Resource user groups
- (2) Watershed level by SCOR Watershed Offices
- (3) National level by Colombo SCOR office

First level of the activities is the group level which needs specific treatment in the SCOR project. For the generation of the promise outputs, it is the resource user group(RUG) that has to be identified, assisted to get organized and then strengthened. Thus the RUG forms the basic unit for action at the field level. Once identified and organized to undertake SCOR initiated activities, the RUGs themselves will start monitoring their own activities.

Watershed teams will have arrangements to collect necessary items of this self monitoring information from the RUGs using a set of indicators that will reflect change/progress of the activities undertaken and the status of the group, at least once a month. The catalysts will make arrangements to help RUGs to organize this monitoring activity using resources from the groups. They will, together with other team members, verify the information periodically where necessary. This activity will provide a source of information for verifying the host country contribution by the farmers conservation measures as well and forms part of the SCOR watershed field level management information system(FMIS).

**Figure 5**

**A MINIMUM SET OF INDICATORS USED FOR DATA COLLECTION  
FROM THE RESOURCES USER GROUPS**

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- # of current members of the group
- # and quantity/extent of new production/protection activities undertaken during month/quarter
  - eg. length of contour bunds established
  - length of organic bunds established
  - length of reservations planted with trees etc.
- # of interactions had with Government officers on activities
- # of members received training
- # of meetings held
- # and amount of grants/credit received
- Group investments by type of activity
- Rates of survival of already undertaken activities
- Change of status of the group

---

The group level monitoring will include periodic RUG self assessment as part of the SCOR participatory process primarily for them to know about the current group status to predict the immediate future of their efforts with their own abilities and constraints so that they can take corrective action in time.

At the second level of monitoring, watershed team will have arrangements to collect information on the implementation of their activities in the watershed. Monitoring at this level will be on the detailed activity plans prepared by the watershed teams.

The work plans produce planned outputs against each activity indicated as an achievable target during a specific time frame not exceeding two years in the first phase. Based on these activities a set of indicators were developed identifying the unit of measure, instruments, method and the person responsible for data collection and measurement. A set of selected indicators appear on annex 5.

Baseline data will be collected to facilitate ongoing and end of project evaluation. A framework for the collection of baseline data has been prepared. There will be an ongoing evaluation at the end of the first year using selected number of indicators and an end of first phase evaluation that will help assess the trends set in the major area of intervention by the project.

In order to receive, entry and store data at the watershed office 5 databases are created. At present 5 such databases are maintained as follows.

Figure 6

DATA BASES FOR WATERSHED MANAGEMENT INFORMATION SYSTEM

Name of the database	Number of data fields	Purpose
1. Group database	66	To store data on resource user groups, their changing status and activities.
2. Train database	69	To store data on training
3. Host database		To store data on host country contribution
4. Wmarket database		To store data on prices at weekly markets
5. Grant database	16	To store data on user grants

The watershed offices will report the physical progress of activities using data from their detailed activity plans and these data bases monthly. A quarterly report will be prepared by the SCOR Colombo Office and submitted to the National Steering Committee, IIMI Headquarters and USAID. The format of the report and its summary appears on annex 2 and 3.

### FINANCIAL MONITORING SYSTEM

The financial Monitoring System (FMS) will categorize and aggregate all SCOR project expenditure into 10 items, and 12 major interventions. Two of those interventions are administration and research that are relevant to all the three cost centres viz. (1) Colombo Office (2) Huruluwewa watershed and (3) Nilwala watershed. The balance 9 interventions are relevant to activities carried out by the teams of the two pilot watersheds.

The 10 items of expenditure categories (general ledger classification) and the 12 major interventions appear on figure 7 and 8.

Figure 7. CLASSIFICATION OF EXPENDITURE

CATEGORY	CODE
1. Staff Salaries International Local	
2. Consultants. International Local	
3. Travel and Per-diem International Local	
4. Workshops and training International Local	
5. Operation and maintenance of vehicles and office and research supplies and services	
6. Information, education and communication material	
7. Audit	
8. Indirect cost/overheads	
9. Sub-contracts/grants	
10. Vehicles, equipment and commodities	



**Figure 8. CLASSIFICATION BY MAJOR INTERVENTIONS**

CATEGORY		CODE
1.	Stabilization of chena and encroached state lands	
2.	Regeneration of tank eco-system	
3.	Integrated water management	
4.	Sharing resources for improving homestead	
5.	Ground water development and management	
6.	Land consolidation in minor tanks	
7.	Integrated planning and coordination	
8.	Organization of user groups for production related services	
9.	Shared management of Land and water resources	
10.	Improving tea paddy culture	
11.	Research	
12.	Administration	

The expenditure under the items 1 to 11 under major interventions will be further classified by location by micro watersheds within the two pilot watersheds. This information will be displayed using SCOR GIS (Geographic information system).

As its output financial monitoring system will produce information on the use of financial inputs in respect of the above categories and present them in a bimonthly, monthly and quarterly reports to the SCOR Colombo core group, provincial and national steering committees, IIMI headquarters and USAID as required. The bi-monthly financial report will be an internal financial monitoring report presented to the Colombo core group for financial control compiled from the reports submitted by the two watersheds.

The format for the bi-monthly financial report appears on figure 9. The format for the flash report on committed expenditure by the watershed appears on figure 10.

The GIS system will produce thematic maps for all the sub-watersheds showing relevant characteristics for analysis. These maps will be linked with a data base by a location code system that would facilitate the use of maps for showing monitoring results in their spatial dimension. Figure 11 lists the sub-locations by which information will be presented and displayed.

Figure 9. BI-MONTHLY EXPENDITURE STATEMENT  
 .....WATERSHED  
 REPORTING PERIOD FROM.....TO.....

CODE	DESCRIPTION OF EXPENDITURE	AMOUNT Rs.
6666	1. House rent (a) (b) (c) (d) (e) Offices	
6639	2. Caretakers wages	
6670	3. House repairs and maintenance	
6745	4. Vehicle hire charges (a) (b) (c) (d)	
6673	5. Vehicle repairs and maintenance	
6743	6. Fuel Hired vehicles Motor cycles	
6661	7. Driver overtime	
	8. Office operations	

6639 6670	9. Guest house Caretakers salary & allowances Maintenance	
6745 6747 6624	10. Staff travelling and subsistence 11. Training 12. Local consultancy fees 13. Salaries and Benefits	
6749	14. Resources persons per diem	
	15. Contingencies	
2303	16. Equipment	
6766	17. User sub-grants and sub-contracts	

Figure 10. MONTHLY COMMITTED EXPENDITURE

DESCRIPTION	BUDGET PER MONTH	JANUARY	FEBRUARY	MARCH	TOTAL

Figure 11. CLASSIFICATION BY LOCATION

LOCATION	CODE
<u>HURULUWEWA</u> Meegaswewa sub-watershed Mahadivulwewa sub-watershed Kivulekadawewa sub-watershed Drainage area of Huruluwewa irrigation system up to Illukwewa anicut Huruluwewa command area Tract 6 of Huruluwewa command including homesteads Mahaweli feeder canal from Lenadora to Habarana	
<u>UPPER-NILWALA</u> Millewa Aninkanda Diyadawa-Tenipita Horagala	

## **6. PROPOSED RESEARCH STUDIES UNDER SCOR**

### **6.1 Water balance**

Inadequacy of water for agricultural production is the typical problem in the dry zone, particularly in Huruluwewa watershed. In Huruluwewa, the situation is further aggravated by the fact that a large quantity of water diverted from the Mahaweli network to the tank is tapped legally and illegally en-route of its feeder canal. As a result, the farmers are deprived of systematic cultivation of crops.

It is likely that the tank supplies can be augmented with water diversions from elsewhere, as well as with shallow ground water supply. The ground water potential and its recharge-depletion relationships will be assessed by the ground water management component of the work plan. Thus, a surface water balance study of the Huruluwewa watershed will be required initially to assess the water supply potential and present demand with a view to understanding how best the available water resources can be utilized for improved agricultural production.

### **6.2 Integrated watershed water management**

Water is the limiting factor inhibiting agricultural production in the dry zone. However, the water scarcity has become acute due to the absence of an integrated approach for development and management of the available water resources within a watershed unit. It is believed that the productivity of the available water can be greatly enhanced by managing the available water resources, both surface and ground water, in an integrated manner. In the Huruluwewa watershed, Huruluwewa tank is hydrologically interlinked with a number of minor tanks. At the same time, there are a large number of agro-wells present.

A research study is proposed to evaluate the available surface water resources in the watershed, including that of Huruluwewa and minor tanks as well as the ground water and to study various options for sharing surface and ground water to maximize agricultural production within the watershed. The study will make land use recommendations for the watershed, develop a computer operated model(s) which can simulate different scenarios of water availability in different locations of the watershed, water demand for alternative cropping patterns, and different options for allocating the available water for agricultural production.

### **6.3 Bio-diversity**

Huruluwewa is a dry zone area with an extreme water shortage during the a greater part of the year. Since the main form of agriculture is chena farming, the remaining vegetation is burnt just before the rains. The practice of burning deteriorates almost all

the living plants and animals and hence a threat on bio-diversity. However, there are pockets of vegetation which occupy reserved areas where the natural vegetation is not subject to degradation. It is proposed to conduct a research study to determine the bio-diversity of the eco-system and characterize the usefulness of various vegetation types with a view to improve and sustain it in the long run.

Being in the wet zone, the bio-diversity of the Nilwala watershed is expected to be very high. It is proposed to undertake the same research study in the Nilwala watershed too.

#### **6.4 Desiltation of minor tanks**

There are about 200 minor tanks situated within the Huruluwewa watershed. Typical to many minor tanks of the country, almost all of these tanks are heavily silted up. The siltation has reduced the effective storage capacity of the tanks. The reduced capacity of a tank results in quick flooding of downstream areas and reduction of serviceable command area of it.

As a matter of policy, desiltation of minor tanks is not formally undertaken by the national irrigation agencies. The policy is driven by the common belief that desiltation of tanks would result in very low economic returns. The cost-benefit studies undertaken so far indicates poor returns when the benefits are evaluated considering only the increased agricultural production potential attributable to additional tank storage created by the volume of silt removed. However, it is required to re-examine this policy on the basis of a detailed research study, which consider a wider spectrum of feasible technological options and diverse technical, social, economic and environmental benefits attributable to minor tank desiltation in the dry zone.

#### **6.5 Endemism**

The endemic flora and fauna found in the two watersheds have not been identified yet. How many of the endemic species are endangered is also not known. Endemic and endangered species need to be identified for protection and other research work. This should be given high priority since the endangered species in a drier area are highly vulnerable for extinction. It is proposed to undertake a research study, on priority basis, to identify endemic and endangered species of fauna and flora which exist in the two watersheds and causes for the disappearance of the species. The first step of the study will be to identify, classify and prepare a checklist of all flora and fauna species found. The study will also identify, as much as possible, all herbal and medicinal plants available in the watershed.

## **6.6 Economics of ground water irrigation**

The use of ground water has emerged both as an alternative and a supplementary source of irrigation in the dry zone. The groundwater extraction through agro-wells is increasingly becoming very popular in many water scarce areas of the country, including the Huruluwewa watershed. Few studies so far conducted in relation to the groundwater use for agriculture indicate substantial improvements in production, profits and nutritional levels. However, there are indications of adverse environmental effects attributable to over extraction of groundwater through agro-wells. It is, therefore, suggested to evaluate the true benefits of groundwater use using economic analysis.

## **6.7 Feasibility and economics of micro irrigation**

Cultivation of high value crops under irrigated conditions in homesteads and upper command areas is one of the strategies for improving the income of rural people. This can be done with the use of micro-irrigation technologies such as drip and sprinkler irrigation with the use of locally manufactured low-cost water pumps. However, our knowledge and understanding on the technical feasibility and economic viability of those technologies are very limited.

In Huruluwewa watershed, where surface water is typically scarce, shallow ground water may be used with combination of pump and sprinkler or drip irrigation techniques to irrigate highlands. In the Nilwala watershed too this option can be tested. In addition, it is found that tea, which is the main crop, undergo severe moisture stress during February - March every year, resulting in plant casualties and yield reduction. It would be possible to provide supplementary irrigation to tea plants, using micro-sprinkler irrigation together with ram-pump technology. However, the technical feasibility and economic viability of these intervention need to be tested through an applied research study.

## **6.8 Eco-tourism**

The potential for expansion of eco-tourism in the Huruluwewa watershed has not been examined in the past. The Ritigala in the adjoining watershed is full of monuments with archaeological importance. The flora and land scape there might attract many a tourists having scientific interests. The Kiulekada tank within Huruluwewa watershed is another attractive location where various types of birds are found even in the dry season. The tank is deep with a large dead storage and hence bird and animal life is very active. The tank is surrounded by forest on many sides. Before promotion of eco-tourism in the area, it is necessary to identify the potential sites and the nature of attractions for the tourists.

Also, the potential for expansion of eco-tourism within the Nilwala watershed has not been examined. Such expansion will result in sharing the resource which has a limited use at present as a place of eco-tourist attraction. This study will identify areas suitable for eco-tourism and thereby to develop a program to tap this potential.

## **6.9 Vegetation change and rainfall**

The impact of vegetation on river flows and regimes has been well documented. Whether the rainfall is influenced by the local vegetation is an area which is not known yet. Evidence from elsewhere shows that the local rainfall can be influenced by the local vegetation type and the extent. The evidence is reported in respect of dry areas. The study on the effects of vegetation change on rainfall are also important for the SCOR which is planning to convert cleared areas into vegetation cover. Huruluwewa itself is considered a water deficit system. Therefore, if there is any effect on re-vegetation on local rainfall, it will be beneficial to the watershed.

Re-vegetation takes time and it takes still more time to ascertain any effects of vegetation change on the rainfall. Therefore, this study may take several years. It will be conducted in both watersheds.

## **6.10 Social conflicts and strategies for resolution**

There are various types of conflicts associated with land, water, forest and in the use of other resources. The conflicts between parties prevent the cultivation of land and planting and management of trees. In the watershed, several lots are not cultivated due to conflicts and hence are left abandoned even when water is available for a crop. Conflicts associated with highland areas are another serious problem. In several instances, conflicts lead to quarrel and even may take the valuable human life. A great deal of farmers' and other resources may have to be spent in resolving these conflicts. The impact of social conflicts on the management of land and water resources has not been assessed in the watershed. Such an assessment would be the starting point for the development of an institutional mechanism to resolve them. In this regard, the indigenous conflict resolving mechanism should be highlighted.

This study will examine the type and nature of conflicts and their effects on the sustainable management of land and water resources. Their effects on production and protection will also be examined. Then the type of interventions that will be required to resolve the conflicts will also be studied. The study will be undertaken in both watersheds.

### **6.11 Agri-business**

Like any other rural area, Huruluwewa watershed offers a large number of natural resources which are not utilized fully at present. This is true for the Nilwala watershed too. Many resources such as naturally grown (and no contamination) fruits are wasted due to lack of opportunities for processing and marketing. Meanwhile, lack of employment, and poor income among the rural people are rampant. Thus, there exists a great potential for promoting business opportunities within agricultural sector for income and employment generation. Development of agri-business opportunities may also go hand-in-hand with the development of local industries. It is, therefore, proposed a research study be undertaken to: identify potential agri-business opportunities; assess resource requirements; evaluate their income generating potential etc.

### **6.12 Indigenous knowledge and practices**

Huruluwewa watershed has a very long history dating back to the pre-Christian era. Evidence suggests that over this long period of history, a wealth of indigenous knowledge and a vast number of practices have been adopted in accomplishing tasks related to irrigated farming, rainfed farming (chena), pests and disease control, soil fertility enrichment, crop-livestock integration, water conservation, forestry, health, food processing, etc. In addition, there had been a host of local institutions and their relations which ensured the proper functioning of the tasks mentioned above. Over the years, a majority of indigenous practices and a greater part of the knowledge have been disappeared. The proposed research study will aim at consolidating the available indigenous knowledge and practices.

This study will identify the type of knowledge and practices and attempt to document the wealth of such knowledge relating to agriculture including crop/stock health, irrigation, forestry and conflict resolution mechanisms. A long-term research interest will be to adopt the indigenous knowledge and practices to examine whether they can be adopted with profits under present day farming conditions.

### **6.13 Improving the agricultural potential in lower Nilwala watershed**

Heavy flooding had been a serious problem in the lower Nilwala watershed in the past. The government implemented a flood protection and control project, called Nilwala Ganga Flood protection and Drainage Scheme (NGFP&DS), to mitigate the threat of floods in the recent past. Although, the NGFPD&S has reduced the threat from floods in the Lower Nilwala Watershed, it is reported that a set of adverse environmental problems have cropped up due to excess drainage. Development of acidity, alkalinity and iron toxicity in the Lower Watershed, particularly in Kiralakale irrigation and



drainage scheme, are a few of those problems that affect agricultural production and productivity.

While proper surface drainage is a pre-requisite for agricultural production, it is also required at the same time to prevent excess drainage in previously waterlogged areas to control the development of acidity and toxicity. This means ground water table in the area has to be maintained within a specific range of levels. The proposed study would evaluate the parameters for ground water table management and develop guidelines for operating the drainage system for optimum agricultural production in the area.

#### **6.14 Improving Agricultural Potential in Coastal Low-lying areas**

Most of the agricultural lands along the coastal areas, particularly in the Southern Province, are typically low-lying. Thus the agricultural potential of those lands is limited. Such water-logged areas in many parts of the world are successfully cultivated with high value crops using ground water drainage techniques. However, such technology is not used in Sri Lanka.

It would be useful to explore the possibility of applying ground water drainage techniques to effect sub-soil drainage for improving agricultural potential of water-logged low-lying alluvial lands of the country. A research study is proposed to evaluate the hydraulic parameters required for ground water drainage design, and economies of various ground water drainage technological options. This study will be complementary to the research study proposed under item 14 above.

#### **6.15 Conjunctive Use of Tank and Well Water**

Use of tank water in conjunction of well water in irrigated command is one of the strategies to improve productivity and cropping intensity of many minor and major tanks. Although there has been increasing recognition of the viability of the conjunctive use mode, it has hardly been implemented on a scientific basis. An applied research study is proposed to evaluate the behavior of water flow from irrigation canals to agro-wells; ways and means of accelerating or decelerating water seepage; response of ground water table to rainfall, seepage, evapotranspiration, ground water obstruction; different modes of system operation for conjunctive use; and related social, economic and institutional issues.

#### **6.16 Planning for Conjunctive Use in Irrigation Rehabilitation**

This is also a study complementary to research proposal No. (16) above. The idea is to develop a design methodology and a guideline for rehabilitating an irrigation scheme for

conjunctive use of tank and well water, so that the methodology and guideline could be adopted by the irrigation agencies for irrigation rehabilitation planning and design. The methodology and guideline could be developed on the basis of lessons and experiences from an actual task of planning, designing and rehabilitating one or two irrigation tanks to facilitate conjunctive use after rehabilitation. The procedure would involve field monitoring of some parameters such as rainfall, recharge from rainfall and irrigation water, ground water potential and available yield, design well density, optimum service area under an agro-well etc. The guidelines could be even further updated on the basis of the experiences of operating the scheme for conjunctive use after rehabilitation.

#### **6.17 Evaluation of Alternative Irrigation Rehabilitation and Modernization Strategies:**

Huge investments are being made for rehabilitation and modernization of irrigation projects. However, there is apparently no policy for selecting technological options in the rehabilitation and modernization of irrigation projects. A study is proposed to evaluate and compare the cost-effectiveness, performance and productivity of various technological options and different combinations of each of the options such as automatic water control devices; conjunctive use; canal lining. This can be conducted as an applied research in a few minor tanks selected for rehabilitation under the on-going National Irrigation Rehabilitation Project (NIRP).

#### **6.18 Reservoir Sedimentation Studies**

Reduction of reservoir sedimentation is one of the major effects of watershed management. However, the data on the degree of siltation of major and minor tanks of the country are not available. On the other hand, the data on the relationships between land use, soil erosion, sediment transportation and reservoir sedimentation are not known. A research study is proposed to study the siltation of a few selected major and minor tanks with a view to establish national data on; tank siltation rates; river flow and sediment discharge relationships, effects of land use on soil erosion and reservoir silting; and problem of distribution of sediments within the tank beds. The study would be aimed at developing a methodology for monitoring sediment flows in rivers and sedimentation rate in the tanks and developing indicators for sediment flow.

#### **6.19 Environmental Impacts of Irrigation**

Although, there is mounting evidence of adverse environmental effects of poor irrigation practices, the scale of the problems are not known to any degree of accuracy. For instance, the extent of irrigated land that has become unproductive due to salinity development or loss of fertility or reduction of the effective storage capacity of tanks are

not adequately known. A study covering several selected irrigation schemes to assess the nature and scale of environmental problems is proposed with a view to establish the baseline status with respect to major environmental problems associated with irrigation.

## **6.20 Economics of Land and Water Conservation Measures.**

It is well accepted that land and water conservation brings substantial returns in the long run. It is also accepted that land and water conservation not only improve in-situ land fertility and productivity, but also generate substantial benefits to the users of land and water downstream of the watershed. However, the benefits and returns of land and water conservation are only qualitatively known, but not quantitatively. Availability of quantitative data base on costs and short-term and long-term benefits of land and water conservation is essential for a country like Sri Lanka for policy planning, policy formulation and policy implementation in relation to land and water subsectors, both at the centre and the province. Such a data base will also be useful for the users of land and water resources to select and adopt various options for conservation. Applied research will be undertaken to evaluate the economics of conservation.

**REFERENCE METRIX FOR MAJOR SCOR OUTPUTS AND WORKPLAN ACTIVITIES**  
**WORKPLAN – HURULUWEWA WATERSHED**

OUTPUT NO	OUTPUT AS PER TECHNICAL REPORT	WORK PLAN ACTIVITY NO.
1 a 1	Forming expanding and strengthening Resource user groups	8
1 a 2	User organizations	8,3a
1 a 3	Sub – User councils	8
1 b 1	Training representatives of user groups	1a2, 2a2, 2a3,
1 b 2	user organizations	2a4
1 b 3	user sub – councils	1a2
1 d 1	Small grants to user groups to invest in common group assests	2c, 4c
1 e 1	New commercial opportunities for user groups	4f,4g
1 f 1	Production companies linked to new markets	8
1 g 1	Rural based commercial activities with matching grants	4a, 4b, 4c, 4d, 4e
1 h 1	User organizations conferred with legal status and power	3a, 3c
2 b 1	Land leases/usufruct processes leading to production companies	8
2 b 2	Commercial activities	3c
2 c 1	Demonstration of benefits of jioint management in small tanks	1c
	Minimum of 3000 ha under joint management	1b, 1c, 2b, 2d,3c, 3d, 4e
3 a 1	Improved systems of resource use and user operations monitoring	5
3 b 1	Officers trained in local level planning group formation and support at nationallevel	1a1
3 b 2	at provincial level	1a1
3 b 3	at divisional level	1a1
3 c 1	Training on participatory natural resource management to NGOs and private sector organizations	1a2
3 d 1	NGOs and private sector organizations providing technical managerial and commercial information to user groups	1a2
4 a 1	Improved methods developed for multi – level planning and coordination in pilot watershheds	7
4 b 1	Groups/organizations support and promote planning and coordination in pilot watersheds	7
4 d 1	Improved land and water resources information and monitoring system designed	3b1
4 e 1	Institutional mechanism to coordinate and support land and water management practices made operational at provincial and national levels	7

**Note:**

The activities of the work plan are ordered according to the major interventions. The above metrix links activities to the SCOR promised outputs appearing on pages 21 – 24 of the technical report.

**SCOR PROJECT - HURULUWEWA**  
**WORK PLAN (NOVEMBER 1993 TO SEPTEMBER 1995)**

MAJOR INTERVENTION	OUTPUT	LOCATION	1993/1994 MAHA	1994 YALA	1994/95 MAHA	1995 YALA	AGENCY RESPONSIBLE
(1) STABILISATION OF CHENA AND ENCROACHED STATE LANDS.							
(a) Conservation farming Awareness Programme Training Of Officers/ Users Demonstrations Workshops Visits/Field Days School Programmes	Officers - 125 Farmers 1000 15 04 Farmers 1000 Awareness created among school children 20 Ha. from each User Groups (2000 ha.)	K.K. M.W., D.W.E.W T/6, MDW, MRW, SD MD, MW, EH, HS1 SILN, CA	25 100 05 - 250 All Schools in the Watershed 50 ha.	25 250 03 01 250	50 500 07 02 250	25 150 - 01 250	DOA,DAS,PD SCOR Team, DS Consultants IMD, ED
(b) Stabilisation of chenas							
(c) Conservation of Channels, Roads, Streams and Tank Bunds.							
Channels	30 km	Part of LB and RB - Huruluwewa and Feeder Channel	01 km	02 km	13 km	04 km	G.A, ID, IMD, PD, SCOR, NGOO, USER GROUPS
Roads	15 km	Some distance within the Watershed	01 km	02 km	12 km	-	GA, DS, PS, USER GROUPS
Streams	25 km.	Some Distance of Yan Oya	01 km	05 km	14 Km	-	GA, DS, USER GROUPS, SCOR, ID, PD, IMD
Tank Bunds	05 km	Huruluwewa, Mahadivulwewa and some small Tanks in command Area	-	-	05 Km	-	ID, DAS, DS, USER GROUPS NGOO
(2) REGENERATE TANK ECO-SYSTEM							
(a) Awareness Programme							
Demonstration Established	1 Demonstration	Huruluwewa	01	1	1	1	CS, GA, ACLQ, DS, USER GROUP, FOODAS, PD, DI
Training (Officers/Users)	Officers 30 Farmers 1000	Kiulekadawewa Mahadivulwewa Meegawewa Hiriwadunna Wewa Thalkole Wewa Maha Rambawa Wewa	15 200	15 800			LC, DOAJR DP, DE, PH NNGOO
School Programme	Schools - 22 Students - 3750	Schools Students	4 700	5 850	6 1000	7 1200	
Visits/Field Days	Farmers 500		100	300	100		
(b) Conservation of chenas in Catchments	320 ha	Huruluwewa Kiulekadawewa Mahadivulwewa Meegawewa Hiriwadunna Wewa Thalkole Wewa Maha Rambawawewa	200 ha 25 ha 25 ha 25 ha 25 ha 30 ha 15 ha 320 ha				

MAJOR INTERVENTION		OUTPUT	LOCATION	1993/1994 MAHA	1994 YALA	1994/95 MAHA	1995 YALA	AGENCY RESPONSIBLE
(c) Establishment of Nurseries		Nurseries established in each locations (Total 35 Nurseries)	Meegawewa Mahadivulwewa	15	20			
(d) Restoration of Gogommana Perahana Kattakaduwa		30 ha	Eco system in - 02 Tanks	02	05	15	08	
(3) INTEGRATED WATER MANAGEMENT								
(a) Formation of Farmer Organizations from Lenadora to Ilukwewa under one Agency		Strengthening of existing organizations IMD - 23 DAS - 26 New organizations - 10	(1) Lenadora to Sigiriya (2) Sigiriya, Talkole, Hiriwaduwa Miriwadunawewa & Habarana Tank (3) From Habarana to Reservoir (4) Reservoir to Ilukwewa	06 06 3	17 20 7			CS-NCP,CP, DAS(CP),IMD,SCOR,ID,NCP, CP
(b) Feeder Channel								
Inclusion of Huruluwewa Officialah in Mahaweli Water Pannel		Release of full quota assured (150 cucecs)		100%				SCOR, IMD,CS,MEA
Proper Operation and Maintenance of the Channel		(a) Handover the full system to ID/ Huruluwewa (Except 1st 5 miles) (b) Turn Over the Channel System to Farmer Organization and Maintain the Channel in correct profile.	Lenadora to Sigiriya Tank	75%	25%			SCOR, IMD,ID,FO,MEA
Coordination among F.O.O. in the System		Supply of 90 cucecs to Huruluwewa assured	Lenadora to Huruluwewa Tank			100%		SCOR, IMD,ID,FO,PMC
Establishment of appropriate cropping systems.		Appropriate cropping systems in 05 ha established	Lenadora to Huruluwewa Tank		50%	50%		SCOR,DOA,DAS,DS,IMD,ID
(c) Command Area Crop diversification during Maha and Yala		Yala - 1500 ha Maha - 1000 ha	Huruluwewa, Kiulekada, Mahadivulwewa, Maha - Rambawa, Meegawewa	1000	1500	1000	1500	DS,DOA,DAS,ID,ADA,FO, IMD, SCOR

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MAJOR INTERVENTION	OUTPUT	LOCATION	1993/1994 MAHA	1994 YALA	1994/95 MAHA	1995 YALA	AGENCY RESPONSIBLE
On-farm Water Management							
Conjunctive Use of Water (Agro-wells)	Conjunctive use tested in tract 6		Efficient use of Irrigation Water.				DS, ID, IMD, SCOR, FO, DOA, DAS
Timely Cultivation	Commence Yala before mid April (New year) and Maha with first rains commencing from October onwards.						
Irrigation Scheduling	A report						
Operation and maintenance of the systems	Identify & rectify O&M problems in tract 6 through use participation.		75%	25%			SCOR, IMD, ID, FO
Coordination with the activities of small tanks within the Huruluwewa Scheme	Efficient System Management						
	One sub-council formed including representatives of small tanks in Huruluwewa.	Kannimaduwa, Ihalgamewewa, Dutuwewa, Gatalawa, Kokawewa, Palugollagama, Maradanakadallawewa, Jayanthiwewa, Ilubbodayagamawewa and Ilachchankulama.	10%				IMD, ID, DAS, DS, CS
(d) Drainage Area							
Utilisation of drainage Water of Huruluwewa	Drainage water utilization improved in 300 ha.	From Nikawewa Anicut to Ilukwewa Anicut	60	150	90		GS, DS, SCOR, DOA, DAS, IMD & LCD
On-farm Water Management							
Establishment of appropriate cropping systems	Cropping patterns introduced in 300 ha of drainage area		60	150	90		
			-	150	90		
(4) SHARING RESOURCES FOR IMPROVING HOMESTEAD							
(a) Establish three Commercialized plant nurseries	Production of required seedlings assured 3 nurseries	Two nurseries in Huruluwewa, command area and one in feeder channel		02	01		SCOR, DOA, IMD, FD
(b) Establish Model Homesteads	28 model Homesteads (2-model Homesteads from each location)	KK, NW, OW, EW, T/6, MDW, MRW, SP, MD, MW, E-H, H-SI, S2-LM, CA	4	4	20		DS, SCOR, DOA, IMD
(c) Expansion of Homestead due to spread effects	112 additional homesteads emerged as models 250 house holds benefited		16	16	80		
(d) Livestock Improvement of Milk Production Heads - 500	500 heads of cattle 250 households benefited	KK, NW, OW, EW, T/6, MDW, MRW, SP,	50	75	125	250	SCOR, DAPH, DS, NESTLE
Processing of milk and Establish market links	2 processing units 250 farm families benefited	KK, NW, OW, EW, T/6, MDW, MRW, SP,	150	325	375	750	SCOR, DAPH, DS, NESTLE
Promotion of goat rearing	150 heads of goats 75 farm families	Huruluwewa Command area		75	75		SCOR, DAPH, DS, NESTLE

MAJOR INTERVENTION	OUTPUT	LOCATION	1993/1994 MAHA	1994 YALA	1994/95 MAHA	1995 YALA	AGENCY RESPONSIBLE
(e) Promotion of apiculture and Medicinal herbs	Introduction of 300 bee colonies Medicinal herbs - 5 ha.	KK, CA, MD, MRW		25	200	75	SCOR, DOA, FD
(f) Establishment of Fruit villages	2 villages (100 ha)	CA, MD, SD, KK		05	10		AD
(g) Promotion of Agro-based industries	increase income for 250 farm families	KK, NW, GW, EW, T/6, MDW, MRW, CA		50	100	100	DOA, SCOR, DS, IMD SCOR, DOA, DRD, DSL, MPI, IDB
(5) GROUND WATER DEVELOPMENT AND MANAGEMENT							
(a) Research on ground water	Ground Water potential assessed and recommendation on ground water use made. A report	Feeder Canal/HW catchment, command Highland and Drainage		Research findings will be out before August '94 and recommendations will be implemented from Maha 94/95.			SCOR & IIMI AND ID
(b) Monitoring	Monitoring System established A report	Feeder Canal, HW catchment, command Highland and Drainage		Before commencing of Yala 94			SCOR, ADA, LC, DS, ID
(c) Providing necessary services through user groups	5 user groups providing services	Feeder Canal/HW catchment, command Highland and Drainage		25%	10%	65%	SCOR, IMD, ID, BANKS, ADA
(6) LAND CONSOLIDATION IN MINOR TANKS	Increase Land Use efficiency & Increase Cropping intensity.	MD, Kanni - Maduwa, Meegawewa, Thelhawadiyawewa and 2 NIRP Tanks.	35	80	60		SCOR, DAS, DS, SVD
Formation of user groups	15 user groups formed		15				
Initiate land consolidation	5 tanks			5		1	
Consolidation of ownership	1 tank						

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MAJOR INTERVENTION		OUTPUT	LOCATION	1993/1994 MAHA	1994 YALA	1994/95 MAHA	1995 YALA	AGENCY RESPONSIBLE
(7) INTEGRATED PLANNING AND COORDINATION								
Promote later - agency collaboration		An integrated watershed management plan developed	DS divisions of Galenbidunuwewa, Palugaswewa, Kalirawa, Dambulla and Naula	Continuous process				All relevant agencies engaged in development activities in the watershed.
Promote later - project coordination		WRMT institutionalized as coordinating mechanism at DS level						
Coordination at centre, Provincial Council and Divisional Levels		NSC/PSC/DS coordination institutionalized as a coordinating mechanism						
Coordination with Local Political Leadership		Awareness created among local political leadership						
Promote Integrate efforts of NGO and private firms		A number of NGOs and private firms involved in production and protection	KK, M/W/D/W, E/W, T/6, MDW, MRW, SD, MD, M/W, E-H, H-SI, SI-LN CA	50 User groups	50 User groups	10 User Organization	1 Sub-User Council	SCOR, DS, IMD, ID, Registrar of Companies
Integrate user organisations		Shared vision in managing natural resources assured.						
Promote user participation in integrated management of land and water resources		10 user organizations integrated into the watershed resources management planning						
(8) ORGANISING USER GROUPS/USER ORGANISATIONS/SUB-USER COUNCILS FOR PRODUCTION PROTECTION AND RELATED SERVICES.								
8.1 Organize groups for production and protection		100 user groups 10 new user organizations 50 existing organizations 1 new user sub - council	KK, M/W/D/W, E/W, T/6, MDW, MRW, SD, MD, M/W, E-H, H-SI, SI-LN CA	50 User groups	50 User groups	10 User Organization	1 Sub-User Council	SCOR, DS, IMD, ID, Registrar of Companies
Training in group dynamics and leadership, resource use planning, sustainable practices, organization and financial management, marketing and self M&E		100 representatives of RUGs 40 reps. of user organizations 4 reps. of user sub - councils						
8.2 Organize and strengthen institutional structures for marketing		Marketing, forward contract Collective bargaining Tenure re - arrangement Formal agreements New enterprises						

RESEARCH ACTIVITIES	OUTPUT	LOCATION	1993/1994 MAHA	1994 YALA	1994/95 MAHA	1995 YALA	AGENCY RESPONSIBLE
(9) RESEARCH WITH NO INTERVENTION							
Water balance	Areas Identified for future Projects	Within Huruluwewa Watershed	From January 1994 upto September 1995				IIMI Research Staff, SCOR Team, Other Research Organisations.
Bio diversity	Assist Planners to formulate policies						
Endemism	Information system established						
Herbs & medicinal plants							
Economics of irrigation							
Eco Tourism							
Vegetation change and rainfall							
Survey							
Water conservation							
Land tenure & conflicts							
Agro industries							
Indigenous knowledge							
Ingenuity & practices							

## Abbreviations:

SWS Sub - Watersheds  
 RUG Resources user group  
 RUO Resource user organization  
 NSC National Steering Committee  
 PSC Provincial steering committee  
 WRMT Watershed Resource Management Team  
 PS Pradeshiya Sabha  
 NGO Non - Governmental Organization  
 MPSC Multi - purpose Cooperative Society  
 CBO Community Based Organization  
 ADA Agricultural Development Authority

DAS Department of Agrarian Services  
 DS Divisional Secretary  
 GN Grama Niladhari  
 FD Forest Department  
 PAD Provincial Agricultural department  
 DOA Department of Agriculture  
 IMD Irrigation management Division  
 ED Education Department  
 PCC Provincial Land Commissioner  
 ACLG Asst. Commissioner, Local Government  
 IRDP Integrated Rural Development Project

CS Chief Secretary  
 LC Land Commissioner  
 DI Director, Irrigation  
 MEA Mahaweli Economic Agency  
 PMC Project Management Committee  
 FO Farmer Organization  
 LCD Land Commissioners Department  
 DAPH Department of Animal Production and  
 DSI Department of Small Industries  
 IDB Industrial Development Board

KK Kivulekda  
 MW Meegsawa  
 DW Duiuwewa  
 IW Illakawa  
 T/6 Tract 6  
 MDW Mahadivuwewa  
 MRW Maharambawa wewa  
 Hiriwadunna wewa  
 TW Talkote wewa

**REFERENCE METRIX FOR MAJOR SCOR OUTPUTS AND WORKPLAN ACTIVITIES**  
**WORKPLAN – NILWALA WATERSHED**

OUTPUT NO	OUTPUT AS PER TECHNICAL REPORT	WORK PLAN ACTIVITY NO.
1 a 1	Forming expanding and strengthening Resource user groups	1.1.2.4, 1.1.3.3, 4.2 1.2.1.3 1.4.2, 2.1.4 2.2.1.2, 2.2.2.2., 2.2.3.2, 2.2.3.3, 2.3.1., 2.3.6, 3.2.6
1 a 2	User organizations	1.5.2., 4.3, 1., 3.5
1 a 3	Sub – User councils	4.4
1 b 1	Training representatives of user groups	1.1.2.5, 1.1.3.4, 1.4.5, 2.1.6, 2.2.1.3, 2.2.2.3, 3.2.7
1 b 2	user organizations	4.5
1 b 3	user sub – councils	4.5
1 d 1	Small grants to user groups to invest in common group assests	1.5.3, 2.3.8, 2.3.9, 4.6
1 e 1	New commercial opportunities for user groups	1.1.2.3, 2.1.7, 2.2.1, 2.3, 3.1.3, 3.2.6, 4.10
1 f 1	Production companies linked to new markets	4.11
1 g 1	Rural based commercial activities with matching grants	1.3.3, 2.2.3, 2.1.1, 2.2.1.4, 4.7
1 h 1	User organizations conferred with legal status and power	4.3, 4.7
2 b 1	Land leases/usufruct processes leading to production companies	1.3.8, 2.3, 4.11
2 b 2	Commercial activities	1.1.1.1., 1.1.3.2, 1.1.3.5, 1.3.7, 1.4.6
2 c 1	Demonstration of benefits of jioint management in small tanks Minimum of 3000 ha under joint management	1.1.1.1, 1.1.1.2, 1.2.1.1, 1.3.1, 1.3.4, 3.1.1.4, 3.2.1.2, 3.2.2.4.
3 a 1	Improved systems of resource use and user operations monitoring	5
3 b 1	Officers trained in local level planning group formation and support at national, provincial and divisional level	5.4, 5.5
3 c 1	Training on participatory natural resource management to NGOs and private sector organizations	5.4
3 d 1	NGOs and private sector organizations providing technical managerial and commercial information to user groups	4. 1.3.2.
4 a 1	Improved methods developed for multi – level planning and coordination in pilot watershheds	5
4 b 1	Groups/organizations support and promote planning and coordination in pilot watersheds	5
4 d 1	Improved land and water resources information and monitoring system designed	5
4 e 1	Institutional mechanism to coordinate and support land and water management practices made operational at provincial and national levels	5

Note: The activities of the work plan are ordered according to the major interventions.  
The above metrix links activities to the SCOR promised outputs appearing on  
pages 21–24 of the technical report.

**SCOR PROJECT - UPPER NILWALA WATERSHED  
WORKPLAN FOR OCTOBER, 1993 - SEPTEMBER, 1995**

THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
			93		94		95		1	2	3	4	LINE AGENCY	SCOR
			4	1	2	3	4	1						
1 THEME: SHARED MANAGEMENT OF LAND & WATER RESOURCES														
1.1 Non - Vulnerable Degraded Forests (Forest Dept.)														
1.1.1 Establish government and user usufructuary rights														
1.1.1.1 Establish rights for limited use of encroached forests	Usufruct right granted for; Auninlands svs - 100 ha Dyadeva svs - 100 ha Milla Ela svs - 100 ha Horagala svs - 100 ha	Auninlands Kahigashena, Kotapola (N) Pahala Millawa, Morawala Uda Horagala			25	25	50						S/FTMD,CF	KSB
1.1.1.2 Identify present land use in degraded forests and assess number of people involved	1 map for each svs at 1:500	All 4 svs			100%								FD/UTPPD	KSB/AW
1.1.1.3 Establish formal agreements by the state with user groups/organizations	For 400 ha					100%							FD	VKN
1.1.2 Introduce Agro - forestry	Agro forestry systems introduced in 40 ha	above locations			20		20						FD	KSB
1.1.2.1 Identify locations for interventions	A document showing locations and map	as above				40							FD/PAD	KSB
1.1.2.2 Design possible cropping systems for above areas	A document describing the concepts and proposed cropping system	as above											FD/PAD	KSB
1.1.2.3 Raise plants	50,000 plants	above locations		12,500	12,500	12,500	12,500						FD	KSB
1.1.2.4 Establish user groups	4 User groups formed	One per svs			2	2							FD	KSB
1.1.2.5 Technology Transfer - User training - Demonstration	80 users trained 4 Demonstrations			4	80								FD FD	KSB KSB
1.1.3 Enhance watershed protection by providing production incentives for setting-up/improving industries based on non-wood forest products (Kaul, Bamboo, herbal medicine, bee honey)														
1.1.3.1 Assess possibilities for non-wood forest products utilization	A document describing potential and possibilities			100%									FD	KSB

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THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	SCORE
			93	94	95	96	97	98	99	00	01	02		
1.1.3.2 Establish rights to collect non wood forest products	Rights for three products established		4	1	2	3	4	1	2	3			FD/DS(K.P.N)	KSB
1.1.3.3 Formation of user groups for (a) Kiriul Industry	9 Kiriul produce groups formed	Mugumunulla - 2 groups Berisipamata - 3 groups Horegala (B) 1 group Millaewa - 3 groups		1	1	1							FD/DS(P), PAD	WK
				1	1	1							FD/DS(P), PAD	WK
													FD/DS(K), PAD	DW
				1	1	1								DW
(b) Pinus Tapping	2 Pinus tapping groups formed	Anniland, Hingewatta - 1 group Diyedawa - 1 group			1								FD	WK
					1								FD	WK
1.1.3.4 Develop skills to generate income through non-wood forest products while conserving the forests	120 users trained	Above locations and specific training in formal centers of respective departments		20	40	40	20						FD/DS	KNJ
1.1.3.5 Establish facilities for production, processing, packing and marketing for the above products	2 centres established	Millaewa and Anniland							1	1	1	1	IDB/CISIR/MPCS/K	KNJ
1.2 Degraded Other State Forests (Divisional Secretary)														
1.2.1 Promote conservation farming in cultivated areas														
1.2.1.1 Identify degraded areas for intervention	Degraded areas (400 ha) identified and a report with maps prepared	Anniland, Doda Ingala lands, Diyedawa Hingurupamagala, Millaewa Ela, Kanaboldawa, Yanniland, Moragala Uda Horagala		400									LUPD	AW/NE
1.2.1.2 Establish protective measures: Organic bunds/live terraces SALT techniques, fodder planting on terraced edges	Protective measures established in 400 ha	100 ha per area One group in each area		50	50	100			200				RM/TS/SHDA (M) PD/AP&H PAD	WK/DW
1.2.1.3 Identify/form groups	10 user groups formed	above locations		4	6									WK/DW
1.2.1.4 Establish demonstrations on conservation farming	12 demonstrations	4 - Milla Ela 5 - Anniland 2 - Teapita 1 - Moragala		6		6							RM/TS/SHDA (M) PD/AP&H PAD	DW

THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	SCOR
			93	94	95	1	2	3	4	1	2	3		
1.2.1.5 Establish agreements with state and user groups: (permit/ usufruct)	Usufruct rights/permits granted for 400 ha.	In above locations	4				50	100	100	150			PLC(SF)/DS(K) DS(N)/DS(P)	VKN PSC
1.3 Establishment of stream gardens	4 locations (19.0 km) identified, reports prepared with maps	ANINKANDA MWS Stream originating from Dolhalugala Kanda leading to Thiruvenganga - 10 km. (approx) Liyasage Dola - 1.0 km.	100%										DS(N)/DS(K) DS(P)/CRs/RUGs	DW/WK
1.3.1 Identify locations for interventions in stream reservations		DIYADAWA / THANIHITA Thiruvenganga dola, Mugunumulla - 1.0 km	100%											
		MILLA ELA MWS Stream originating from Yamanakanda, Kanibokkara leading to Milla Ela - 7.0 km.	100%											
1.3.2 Involve existing NGOs, voluntary organizations for establish gardens.	4 NGOs involved	Above locations		2	2								DSs/CRs/RUGs	DW/WK
1.3.3 Procure suitable plants through NGOs, Nursery	10,000 plants arranged	Above locations		5000	5000								NGOs	DW/WK
1.3.4 Establish model stream garden demonstrations	6 models established	Above locations		3	3								DSs/CRs	TKW
1.3.5 Establish user groups	6 groups established	Above locations		3	3								DCAS	WK
1.3.6 Establish user groups	Stream garden models extended to cover 19 kms.	Above locations		3	4	5	7						NGOs, RUG	DW/WK
1.3.7 Extension of model stream gardens by the NGOs involving user groups	Usufruct rights established for 19.0 km length.	Above locations								50%	50%		LC/PLC(SF)	VKN
1.3.8 Establish usufructuary rights through formal agreements	formal agreements entered with 6 user groups	Above locations			6								PLC(SF)/DSs/RUGs	DW/WK
1.4 Revegetating road reservations	Locations for interventions identified 11.5 km. and map prepared	Kalavagala Korattur - Thampin Road - 2.5 Km Thalpalakanda - Berelapathara road - 6 km. Millaela Dola road - 3 km Morewala - Millaela road (Thala portion) 3 km.	100% 100% 100% 100%										DPO(SF) GM/PROV. RDA FD/AP&H, CM/PSs	DW
1.4.1 Identify locations for interventions in road reservations		Above locations 2 groups/areas		2	2	4							GM/PROV.RDA	DW/WK
1.4.2 Establish groups for avenue planting and raising plant nurseries	8 user groups formed	Above locations											Prs Sabla	TKW
1.4.3 Obtain clearance from local authorities for interventions	Clearance obtained (letter)	Above locations		100%										

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THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
			94					95					LINE AGENCY	SCORE
			1	2	3	4	1	2	3	4	5	6		
1.4.4 Arrange for planting materials	10,000 plants and grass cuttings raised.	As above									3000 grams		PD/AP&H	TKW
1.4.5 Arrange training	80 users trained and a report prepared	As above											PD/AP&H	TKW
1.4.6 Arrange granting of usufruct rights	Usufruct rights granted to 80 users (document)	As above											Pre Sabha	TKW
1.5 Mini-hydro power generation through shared capital investment	10 KW power generated through shared investment	Mugunuvalla Kiruvana dola Ammalanda 10 kw											CEB/CP DS, Kotapola	NF/DW
1.5.1 Feasibility study	Feasibility report produced			100%									ITDG	NF/DW
1.5.2 Form user organizations	2 user organizations formed			1	1									DW
1.5.3 Arrange support	Grants awarded and external support arranged.				100%									NF/DW
1.5.4 Plant construction	Plant built										10%	90%		NF/DW
1.5.5 Commission project	10 kw electricity generated											100%		NF/DW
2.0 Theme - Sharing Resources for Improving Homesteads														
2.1 2.1.1 Identify Potential homesteads for introducing market oriented production base	Potential homesteads (125 Nos.) identified and report prepared including map	ANNIKANDA MWS Thalapalanda village - 32 Nos. Balgalahena - 20 Nos. Lajragawetta - 10 Nos.  DIYADAWA TENIPITA SWS Tenipita - 4 Nos. Kahalahena - 3 Nos. Berasdura - 5 Nos. Ola kumbura - 3 Nos.  MILLA ELA MWS Polgawila - 10 Nos. Mallawa West - 20 Nos. Ithala Millawa - 30 Nos.	32 20 10  4 3 5 3  10 8 30										PD/AGRIC Coor./Ind. Mod.	WK  do do do do do do do do do do do do
2.1.2 Studies aimed at homestead management problem analysis	Management problems identified (About 125 Nos. Homesteads) and report prepared	Above locations		50%	50%								PAD	KNJ

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THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	SCOR
			93	94	95	96	97	98	99	00	01	02		
2.2.2.2 Establish resource user groups for floriculture	9 user groups formed	01 per ssw												DW/WK
2.2.2.3 Training on plant propagation and other techniques	135 user trained	above locations												DW/WK
2.2.3 Livestock Development														
2.2.3.1 Improvement of Cattle husbandry	Annikanda 40 units Diyadawa 10 units Milla Ela 25 units	Annikanda ssw Diyadawa ssw Milla Ela ssw											PD/AP&H	TKW/DW /WK
Improvement Goat husbandry	Annikanda 2 units	Liyangawatta and Kaluwagahena												
2.2.3.2 Establish groups for cattle husbandry	7 groups formed	Above location		3	4									WK
2.2.3.3 Establish groups for goat husbandry	2 groups formed	Above location		2										WK
2.2.3.4 Establish demonstration on ruminant feeder legume fences	4000 m.	In all four ssw		1000	1000	2000							PD/AP&H	TKW
2.2.3.5 Establish compost heaps	100 Nos.	As above		25	25	30							PAD/AP&H	TKW
2.3 Establish value adding opportunities for primary products	Value adding opportunities introduced for Milk, Fruit, Kintu Coir and Herbal plants - 100 users benefitted and concept paper developed	Milla Ela, Annikanda and Tenipata		25		25							EDB/IDB/PAD	KNJ
2.3.1 Organize groups for value added production	40 resource user groups formed. Increase income through value added and environmentally sound production	As above		5	5	10	20						IDB	KNJ
2.3.2 Negotiate with existing programmes, agencies and NGOs for interventions	Intervening areas identified and report produced	Above locations		100%									DS(KNJ/P)	KNJ
2.3.3 Arrange technology transfer	Technology transfer arranged for 100 users	Above locations			30						50		IDB/PAD	KNJ
2.3.4 Identify potential markets & linkages	A report showing potential markets and linkages in respect of 7 commodities	Location neutral			100%								IDB/ADA/MPCS/K DS	KNJ
2.3.5 Establish market opportunities & linkage for primary and value-added products	Market links established for 7 products	Above locations				2	2	2	1				MPCS/DS ADA/IDB	KNJ
2.3.6 Organize user groups for collection, processing, package, transport and delivery to market	4 user groups formed	3 ssw 7				2	2						DAS/MPCS/DS	KNJ

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THERMES AND MAJOR ACTIVITY AREAS.	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	SCOR
			93	94						95				
			4	1	2	3	4	1	2	3				
2.3.7 Arrange technology transfer and training for food processing & preserving for organized groups	Processing and preserving facilities established for 4 products and a report produced	above locations					2	2					IDB/PAD	KNJ
2.3.8 Arrange credit facilities for activities in respect of value added enterprises	Credit facilities & service linkages established for 40 RUGs	3 nos				20							RRDB, Banks, Co-ops	KNJ
2.3.9 Arrange input and other service facilities	Input facilities & service linkages established for 40 RUGs	3 nos					10	10	20				Co-ops, DCAS	KNJ
3.0 Improve Tea - Paddy culture														
3.1.1 Promote conservation farming in tea small holding														
3.1.1.1 Identify areas for interventions	Locations (435 ha) identified and report produced with maps	<p>Anantnaga nos: Thalpehlanda, Beralapanshabara - 130 ha. Diyedawa/Tenipita nos: Gobakumbura, Olakumbura, Bodinaya, Geesagoda - 25 ha. Mulla Ella nos: Yanalandra, Kambolka, Millawa West - 250 ha. Moragala nos: Yati Horagala - 10 ha</p>	100%										RM/TSHDA, OIC (TRI) Duniya	KNJ
3.1.1.2 Collect basic data	Data collected through farm records and report prepared	As above	Continue										TSHDA/TRI/DAP	NE
3.1.1.3 Establish protective measures (a) Agronomic measures - Organic Bunds - Live Terraces - SALT Technique - Pasture strips on foot paths & stone terraces (b) Mechanical Measures - Improve existing - Leader drains - Contour drains - Stone terraces	Protective measures adopted in 435 ha.	As above	100				200	135					RM/TSHDA/DIC/TRI/PD/AP&H	WK/DW
3.1.1.4 Introduce tree strips along streams bordering tea lands	Tree strips introduced 4000 m (1000 per nos)	Streams in above locations	1000				2000				1000		RM/TSHDA) M OIC(TRI) D	DW/WK
3.1.1.5 Establish demonstrations on conservation measures and tree strips along stream banks	Demonstrations established 8 Nos. 2 per nos	Above locations	4				4						RM/TSHDA) M OIC(TRI) D	TKW/DW/ WK

Contd..

THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	\$COR
			93	94			95							
			4	1	2	3	4	1	2	3				
3.1.2 Promote planting fuel crops, intercropping and border cropping in tea small holdings	60 ha tea small holdings improved	Same locations selected for interventions under section 3.1.1.1			15		30		15			RM/TSHDA) M OIC/TRI) D	DW/WK	
3.1.3 Facilitate linkages with small holders and large plantations for supply of inputs, quality planting materials and output marketing	Linkage established - 1000 Tea Small Holders benefitted	In all sites			100	100	200	200	200	200		RM/TSHDA/M) Co-ops, Plantation Agencies	KNJ	
3.2 Improve paddy productivity	8 locations (46 ha) identified and report prepared	Amankanda sunc: Thalapalankanda paddy tract - 5 ha. Pailawita yayu - 10 ha. Diyedawa - Temipala sunc: Nawelabana yayu - ha. Mulla Ela sunc: Ambelankumbura yayu - 2 ha. Linda Liyada - 3 ha. Pausalagawa kumbura - 7 ha. Ambagala goda kumbura - 3 ha. Eeragala sunc: Illulapitiya yayu - 8 ha.	100%									DCAS	DW	
3.2.1 Improve water acquisition and land management														
3.2.1.1 Identify locations and potentials for improvements														
3.2.1.2 Facilitate arrangements for sharing capital for development of irrigation systems	46 ha of paddy lands developed through shared investment	Above locations			10		16		20			PAD/DCAS	DW	
3.2.2 Land consolidation	Paddy lands consolidated - 46 ha.	Above locations										Land Consolidation task force	DW	
3.2.2.1 Consultation with users and collection of relevant data from the institutions	Report produced with relevant data included	- do -	100%									- do -	NE	
3.2.2.2 Identify areas for land consolidation	Areas identified and report produced	Above locations			100%							- do -	DW	
3.2.2.3 Establish contracts with relevant officials & users	Contract established	- do -	100%									- do -	NF/DW	
3.2.2.4 Map out Strategy by the task force	Strategy identified and report produced	- do -										Above task force and	WK	
3.2.2.5 Implement land consolidation in selected sites with Rehabilitation Projects	46 ha of paddy lands consolidated	- do -			6	8	15	17				- do -	DW	
3.2.3 Promote integrated pest management and use of organic manure in paddy lands	Integrated pest management practice and use of organic manure promoted Application of chemical fertilizer reduced, soil physical condition improved 46 ha.	Above locations			10		16		20			PAD/DCAS	DW	

Contd..

Page 2 of 9

THERMS AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	\$COR
			93	94				95						
			4	1	2	3	4	1	2	3				
3.2.4 Facilitate seed paddy production within ssw	A seed paddy yaya established for each ssw - 19 ha	Auninlands ssw Thalapalands yaya - 5 ha. Diyed ssw Tenipala ssw Nuvabons yaya - 4 ha. Milla Ela ssw Auninlands yaya - 3 ha. Pabala Egoda Kunabura Aunus - 5 ha. Horagala ssw Ilupitiya yaya - 2 ha.			1		2		2		2		PAD DCAS/RUGs - do -	WK
					1		1		2		2		- do -	WK
					2		2		4				- do -	WK
					1		1						- do -	WK
3.2.5 Introduce measures to prevent scouring of highland and silt deposition in valleys	Preventive measures adopted to avoid draining run off water into paddy fields - 46 ha.	Locations identified under 3.2.1.1			10		16		20				DCAS RM/TSIDA(M), RUGs	DW/WK
3.2.6 Formation of user groups for improving paddy culture	16 user groups formed	Above locations		16										DW/WK
3.2.7 Arrange training	160 users trained	Above locations		80		80							PAD	DW/WK
3.2.8 Arrange inputs	Required inputs arranged 46 ha. Fertilizer, agro-chemicals	Above locations			10		16		20				DCAS/PAD	DW/WK
THEME: ORGANIZE GROUPS FOR IMPROVED PRODUCTION, PROTECTION, MARKETING AND RELATED SERVICES														
4.0 Identify and assess existing organizations & CBOs etid	Use organizations, CBOs identified and assessed	in 4 ssw	100%											DW/WK
4.1 Organize user groups for collection, transport and delivery of produce to markets	4 user groups formed	in 4 ssw				4								DW/WK
4.2 Formation of single task based organizations from groups formed under different themes No. 1, 2, 3, and 4.2	10 organizations formed	As above				5	5						RUGs, NGOs	KNJ
4.3 Formation of sub user council for organizations mentioned in 4.2	1 sub user council formed	Nilwala Upper Watershed					1						RUGs, RUDs, NGO	KNJ
4.4 Training representatives of: - RUOS - User sub council	40 Reps. trained 04 Reps. trained	in 4 ssw				20	20	4					Resource personnel selected from relevant institutions	VKN
4.5 Arrange small grants for user groups and invested into common user assets	75 small grants arranged to user groups	in 4 ssw			15	20	20	20					DAS	KNJ
4.6 Facilitate user organizations to establish links with lending institutions to obtain credit for commercial activities	10 user organizations linked with credit institutions	All 4 ssw				3	3	4					RRDB, BDC, PB Private Banks, Co-ops	KNJ

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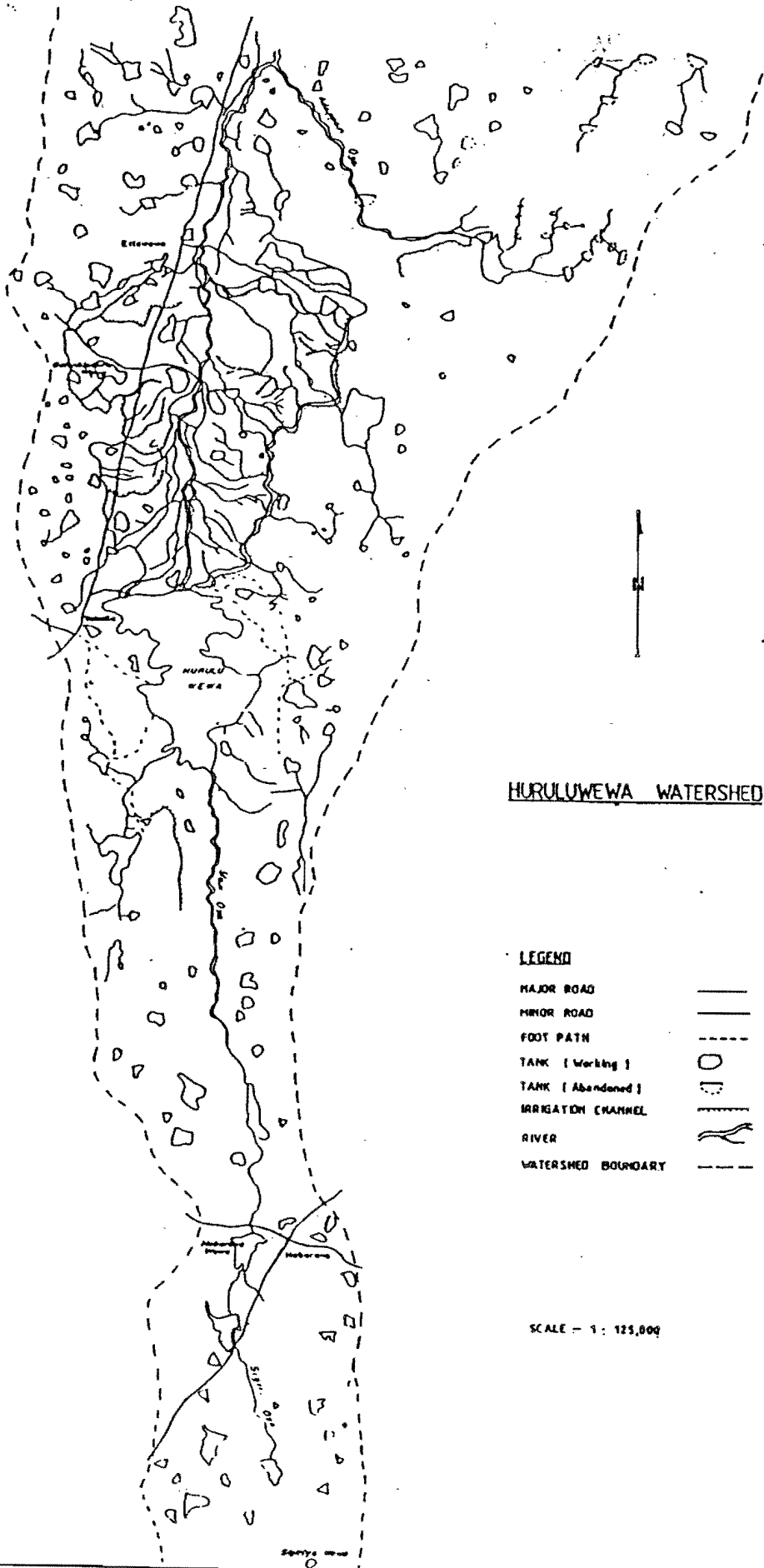
THEMES AND MAJOR ACTIVITY AREAS	OUTPUT	LOCATION	TIME SCHEDULE										RESPONSIBILITY	
													LINE AGENCY	SCOR
			93	94	95	96	97	98	99	00	01	02		
4.8 Facilitate user groups/organizations to procure input supply through collective action	Requirements of inputs obtained through collective action - 10 organizations	All 4 sws											Co-op. Pvt. Co.	KNJ
4.9 Facilitate collective action to ensure higher returns for commodity produce of users and linked to new markets	Bargaining power strengthened, forward contracts established (2 Nos.) Link established with new markets for 4 sws	in all 4 sws											DAS	KNJ
4.10 Establish new commercial enterprises through user groups	5 new enterprises established	- do -											DAS	KNJ
4.11 Facilitate user groups/organizations to form a production company	One production company established	Nilwala Upper watershed											IDR, EDR, CISIR, DOIM, NHB	KNJ
5.0 THEME: INTEGRATED PLANNING & COORDINATION														
5.1 Prepare inventory of govt. agencies and non-govt agencies relevant to land and water management of Upper Nilwala Watershed	Inventory of land and water resources managing agencies and a report prepared	Upper Nilwala watershed	100%										DS	TKW
5.2 Prepare inventory of resource management inputs for Nilwala Upper Watershed with the assistance of agencies mentioned in 5.1	Land and water resources inventory	- do -											DepSecy (P)	TKW
5.3 Facilitate the development of a data-base and information system for land & water resource management	Land and water resource data-base Land and water resource information system (4 Nos.)	4 sws											DS (K), (N), (P), (F)	PR/GB/TKW
5.4 Arrange training on (1) Local planning, user groups formation, support and collaboration (2) Integrated planning (projects programming aspects) for watershed basis for protection & production	10 provincial officials trained 25 Divisional level local officials trained	Galle Respective 4 sws												PR/GB/TKW
5.5 Arrange training on "participatory natural resource management" for NGOs, PVT. Sector orgs (PSOs).	15 NGO & PSO reps. trained	Respective 4 sws												PR/GB/TKW
5.6 Install monitoring & Evaluation systems at Divisional Secretariat/Micro watershed level	sws level monitoring & evaluation system established (4 systems)	4 sws												GB

## Abbreviations

sws = sub watershed  
 RUG = Resource User Group  
 RUO = Resource User Organization  
 NSC = National Steering Committee  
 PSC = Provincial Steering Committee  
 WRMT = Watershed Resource Management Team  
 PS = Pradeshiya Sabha  
 NGO = Non Governmental Organization  
 MPSC = Multi-purpose Cooperative Society  
 CBO = Community Based Organization  
 ADA = Agricultural Dev. Authority  
 TSHDA = Tea Small Holding Dev. Authority  
 TRI = Tea Research Institute

VK = V.K. Narsayekara  
 KSB = K.P. Sri Bhareethi  
 TKW = T.K. Wanasuriya  
 KNJ = K.N. Jayasuriya  
 WK = W. Kuruppu  
 DW = D. Wijesayake  
 NE = N. Edirisinghe  
 AW = Anura Wimalasekharana  
 NF = Nihal Fernando  
 GB = Gaurani Betuwige  
 PR = Paul Rajasekara

DAS = Department of Agrarian Services  
 DS(K) = Divisional Secretary - Kotapola  
 DS(P) = Divisional Secretary - Peggoda  
 DS(N) = Divisional Secretary - Neluwa  
 GN = Grama Niladhari  
 ITDG = International Technology Development Group  
 CISIR = Ceylon Institute of Scientific and Industrial Research  
 IDB = Industrial Development Board  
 FD = Forest Department  
 PAD = Provincial Agriculture Department



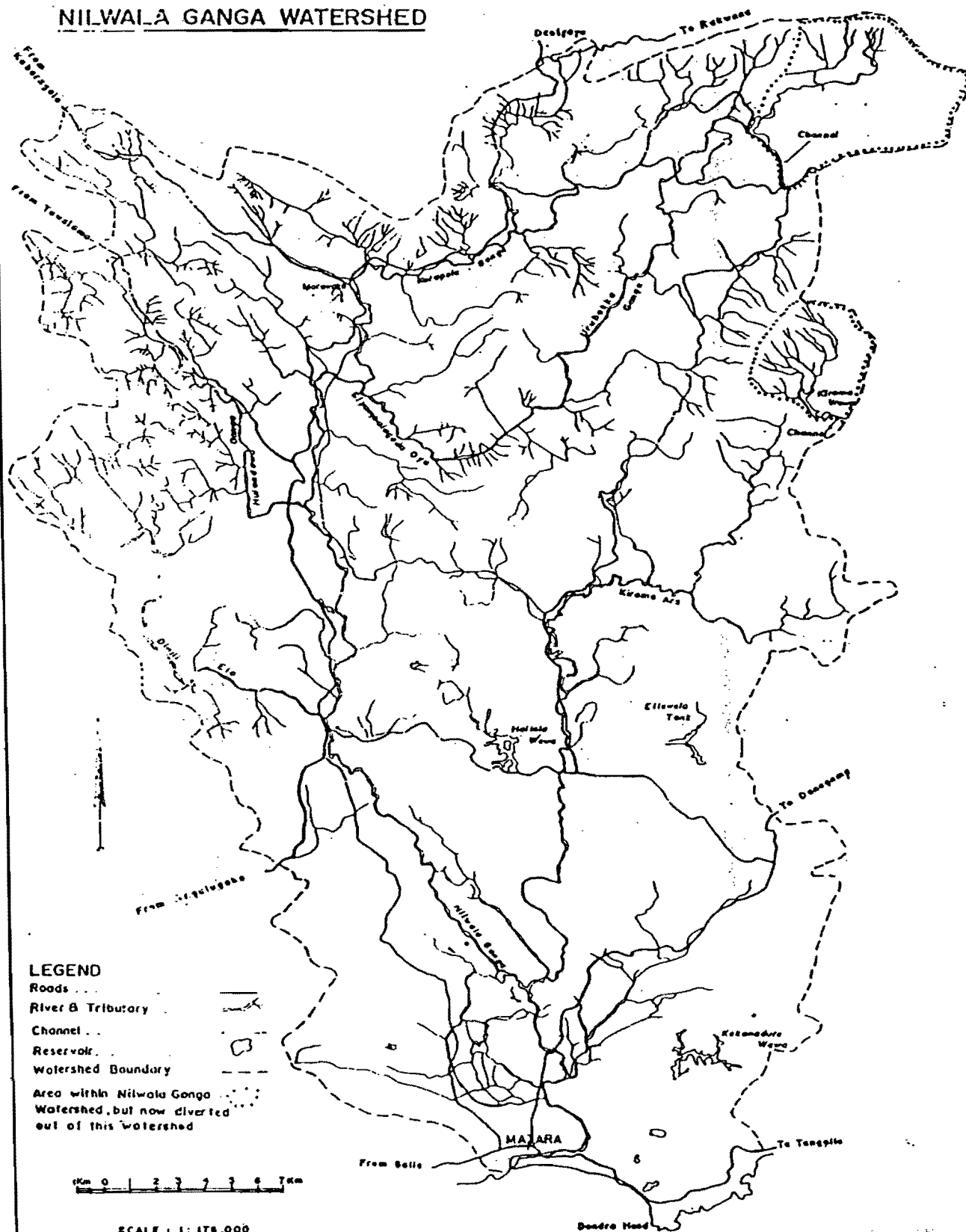
# HURULUWEWA WATERSHED

## LEGEND

MAJOR ROAD	—
MINOR ROAD	- - -
FOOT PATH	...
TANK (Working)	○
TANK (Abandoned)	⊗
IRRIGATION CHANNEL	—+—+—+—
RIVER	~~~~~
WATERSHED BOUNDARY	- - -

SCALE - 1:125,000

# NILWALA GANGA WATERSHED



## Monitoring and Evaluation Framework

Project goal, purpose of objective	Objectively verifiable indicators (illustrative)	Outputs/achievement of 2-yr Co-op. Agreement	End of 6-yr Project Status
1. <i>Goal: To increase the Sustainable Productivity of the land and water resources base in pilot watersheds</i>	<ul style="list-style-type: none"> <li>• Production per unit of land and water increases.</li> <li>• Quality of land and water increases.</li> <li>• Number of environmentally sound production practices increases.</li> </ul>	<ul style="list-style-type: none"> <li>• Bench mark assessment in regard to such indicators as productivity and quality of land &amp; water resources (eg. illegal use of forest, forest cover, etc.) completed.</li> <li>• Few tangible outputs such as investment by user groups, environmentally sound prod. practices etc. will be measured.</li> <li>• A trend analysis of impact will be attempted.</li> </ul>	<ul style="list-style-type: none"> <li>• Form, form expand and strengthen user groups;</li> <li>• Secure shared control through formal agreements between users &amp; state.</li> <li>• Introduce &amp; internalize information &amp; M&amp;E systems.</li> <li>• Help improve support services – credit, market etc.</li> <li>• Improve integrated planning capacity.</li> </ul>
2. <i>Purpose: Increased shared control of land and water resources in pilot watersheds</i>	<ul style="list-style-type: none"> <li>• Significant regulatory procedure or organizational changes exacted to increase shared control.</li> <li>• Land leasing to user groups/small farmer companies accelerated.</li> <li>• Joint management arrangements demonstrated.</li> </ul>	<ul style="list-style-type: none"> <li>• 150 User Groups, 15 User Organizations, 1-2 Sub-user Councils, established and demonstrated formal state user participants.</li> </ul>	<ul style="list-style-type: none"> <li>• Form, expand and strengthen user groups, Training &amp; information systems.</li> <li>• Facilitate establishment of formal agreements between user groups &amp; state.</li> <li>• Economically &amp; environmentally sound production modes.</li> <li>• Other activities listed under objectives II &amp; III below.</li> </ul>
3. <i>Objectives</i> i. Enhance, Govt, User groups & individuals' information base.	<ul style="list-style-type: none"> <li>• Improved information on natural resources base.</li> <li>• Improved MIS and dissemination systems for info. on natural resource use.</li> <li>• National, Prov., Div., level govt. officials, user groups, NGO &amp; selected private sector people trained and made aware of environmentally sound production modes for intensified resource use.</li> </ul>	<ul style="list-style-type: none"> <li>• Significant improvement (over benchmark situation in regard to: a) awareness of users Govt. officials, NGO &amp; private sector, on land water use. b) information base re: land &amp; water. (only in areas covered by Phase I).</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct training for user groups, Govt. officials, NGO &amp; private sector.</li> <li>• Information Education &amp; Communication (IEC) material preparation &amp; dissemination.</li> <li>• Establishment information systems.</li> </ul>

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Project goal, purpose of objective	Objectively verifiable indicators (illustrative)	Outputs/achievement of 2-yr Co-op. Agreement	End of 6-yr Project Status
ii. Form, expand and strengthen user groups; and  iii. Securing shared control of land and water resources by user groups.	<ul style="list-style-type: none"> <li>Organized and federated user groups               <ul style="list-style-type: none"> <li>- User groups</li> <li>- User organizations</li> <li>- User sub councils</li> <li>- User councils</li> </ul> </li> <li>Formal and informal training</li> <li>Economic sustainability enhanced through intensified production in environmentally sound ways</li> <li>% area with improved conservation techniques, sustainable cropping patterns, proper drainage etc. enhanced.</li> <li>Investment by user groups on environmentally sound production modes &amp; techniques enhanced.</li> </ul>	<ul style="list-style-type: none"> <li>150 user groups, 15 user orgs., &amp; 1-2 sub councils established.</li> <li>2 small farmer production companies established.</li> <li>A minimum of 3000 ha. under joint management</li> <li>% area with environmentally sound production increased.</li> <li>Significant improvement in small farmer investment on environmentally sound production modes.</li> <li>Improved drainage and conservation.</li> </ul>	<ul style="list-style-type: none"> <li>Create/strengthen user groups</li> <li>Develop user groups skills in L&amp;W mgt.</li> <li>Participatory design &amp; implementation of economically &amp; environmentally sound production modes.</li> <li>Enhance support services &amp; institutional linkages eg: link RUG with Banks.</li> <li>Legal status &amp; powers to RUGs to success to resource use.</li> <li>Establish small farmer production companies</li> <li>Conduct studies on resource tenure arrangements</li> </ul>
iv. Strengthen capacity at National, Provincial, & Div. level in integrated watershed resource management/planning	<ul style="list-style-type: none"> <li>Improved methodologies, tools &amp; procedures developed &amp; used for multi-level integrated planning of L&amp;W resources on watershed basis.</li> <li>Participatory and integrated planning, involving federated user groups, internalized.</li> <li>Sustainable M&amp;E info. systems</li> </ul>	<ul style="list-style-type: none"> <li>150 user groups, 15 user organizations, &amp; 1-2 sub councils enhanced their capacity in resource mgt. &amp; work closely with relevant agencies.</li> <li>Improved methods, tools &amp; procedures developed for multi-level, integrated planning, (introduction &amp; internalization of participatory planning on watershed will used more than 2 years)</li> </ul>	<ul style="list-style-type: none"> <li>Develop improved methods, tools and procedures for integrated planning.</li> <li>Strengthen linkages and co-ordination among line agencies user-groups and Div./Prov./national authorities in regard to watershed planning.</li> <li>Help internalize participatory &amp; integrated watershed planning.</li> <li>Info. &amp; M&amp;E systems internalized.</li> </ul>

SOOR PROJECT  
PROJECT TARGETS AND PERFORMANCE  
REPORTING MONTH DECEMBER 1993

CO = Colombo Office

HW = Huruluwewa Watershed

NW = Nijwala Watershed

PC&amp;DS = Provincial Council &amp; Divisional Secretariats

[illegible]

## PROJECT TARGETS AND PERFORMANCE

1. Project purpose: To increase shared control of land and water resources in two pilot watersheds

2.	PURPOSE LEVEL INDICATOR	BASELINE	LOP TARGET	TOTAL TODATE	FY94 ACTUAL PLAN	FY95 PLAN
1.	# of groups served by regulatory procedure or organizational change exacted to increased shared control	0	150			
2.	# of land leasing agreements granted to user groups/ organizations	0	150			
3.	# Of joint resources management arrangements	0	5			

3.	OUTPUT TARGETS/PERFORMANCE	BASELINE	LOP TARGET	TOTAL TODATE	FY94 ACTUAL PLAN	FY95 PLAN
1.	User group creation (incl. registration) Total	0	175			
2.	# of representatives of user groups trained	0	600			
3.	# of User Organizations	0	20			
4.	Representatives of User Organizations trained	0	75			
5.	# of Sub-user councils	0	2			
6.	Representatives of User Sub-councils/councils trained	0	8			
7.	# of small grants made to user groups to invest into common user group assets	0	150			
8.	# of user organizations conferred with legal status and powers	0	20			
9.	Modes of commercial opportunities developed and/or supported for user groups	0	10			
10.	Production companies established and linked to new markets	0	2			
11.	# of rural based commercial activities linked to new markets and provided with marketing grants	0	50			
12.	Land leasing/usufruct process facilitating establishment of					
	(1) production companies	0	2			
	(2) Commercial activities	0	50			
13.	Demonstrations of authorizing user groups, joint consolidated land management/production systems in minor tanks	0	5			
14.	# of resources use monitoring systems developed	0	0			
15.	# of resources user operations monitored	0	0			
16.	Training of officials in local level planning, user group formation, support and collaboration Total	0	80			
17.	# of NGOs and other private sector organizations providing technical managerial and commercial information to user groups	0	8			
18.	Improved methodologies and tools developed and applied					

## PROPOSED CRITERIA FOR GRANT DISBURSEMENT

The technical document of the SCOR project has clearly indicated that the project will provide small grants to existing and new user groups and such grants will enable the user groups/organizations to :

- Show collateral when seeking additional loans through private financial institutions;
- Develop and promote insurance schemes for new crops, conservation schemes and investments;
- Construct storage facilities, markets, terraces, nurseries or other small physical infrastructure;
- Purchase equipment needed to initiate or upgrade joint enterprises to gain economies of scale and value added to their production.
- Join with other user groups to establish revolving funds for conservation of investments and/or the purchase of agricultural inputs; and
- Obtain legal, financial and other services associated with established user rights, small enterprises and productive ventures.

Following requirements are suggested in providing grants to RUG/RUO.

- I. RUG/RUO will have a constitution  
(Draft copy attached)

II. Project report :-

Each activity proposed in the work plan should be converted to a mini project of a RUG/or RUO. This mini project report has to be prepared by the particular RUG/RUO with the assistance of SCOR catalyst in consultation with the local officials of the line agency. Mini project report would consist ;

- a) Name of the Mini Project
- b) Location
- c) Clearly defined objectives
- d) Problems that are addressed by the mini project
- e) Proposed action (with representatives and time plan etc.)
- f) Resources required for the successful implementation of the project
- g) Anticipated Costs
- h) Resource user contributions
- i) Assistance expected from the SCOR
- J) Expected outputs

III. Project appraisal :-

Mini Project report should be appraised by an appraisal team of SCOR members. When appraising, economic-viability, social-acceptability, sustainability of the project and whether the project agrees with SCOR concepts should be clearly ascertained.

SCOR members who are appraising the mini project could also divide the cost items to consider;

- i. Items required direct financing by the SCOR.
- ii. Items necessary to finance through bank loans by arranging collaterals.

Recommendations on phasing out of the grant could also be done by the appraisal team.

Recommendations of the appraisal team should be reviewed by the Team Leader/Deputy Team Leader before effecting payments.

#### IV. Bank account :-

Opening up of bank account by RUG/RUO should be encouraged in order to facilitate payments.

#### V. Agreement :-

RUG/RUO should enter into an agreement with the SCOR project for the successful implementation of the mini project. (Draft Agreement form attached)

Hypothetical flow diagrams to depict the suggested flow of grant disbursement and strengthening of economic activities undertaken by RUG/RUO on a sustainable manner are given in Figures 1, 2 and 3.

Few examples of sub components of economic activities undertaken by RUGs which require direct financing through sub grants are indicated below.

1. Stream Reservation Group

- a) Purchase of improved varieties of fruit plants, high value timber plants for stream gardens.
- b) Purchase basic tools, machinery etc. to start a small handicraft enterprise base on raw materials such as bamboo, rattan, bata.

ii. Nursery group

- a) Purchase minor agriculture tools and polythene.
- b) Hire an experienced grafter until such time group members are trained to handle such activities on their own.
- c) Purchase propagating materials.

iii. Homestead group

- a) Purchase of plants (Fruits, medicinal plants, anthurium, Pasture/Fodder cuttings)
- b) Equipment required for economic activities such as food processing

iv. Enterprise development

Equity support or start up capital for small enterprise

Our strategy should be to strengthen the economic activities of RUGs/RUOs by giving financial assistance through user subgrants.

In no way this should be a delivery mechanism where sustainability of such mini projects are doubtful. Changing recipient attitude of resource users should also be a challenging task having before SCOR members.

PROPOSED MINI PROJECT ON "SEED PADDY PRODUCTION" IN MILLA ELA SWS  
 RESOURCE USER ORGANIZATIONS - MILLA ELA FARMER ORGANIZATION (EXISTING ORGANIZATION)  
 (A HYPOTHETICAL CASE)

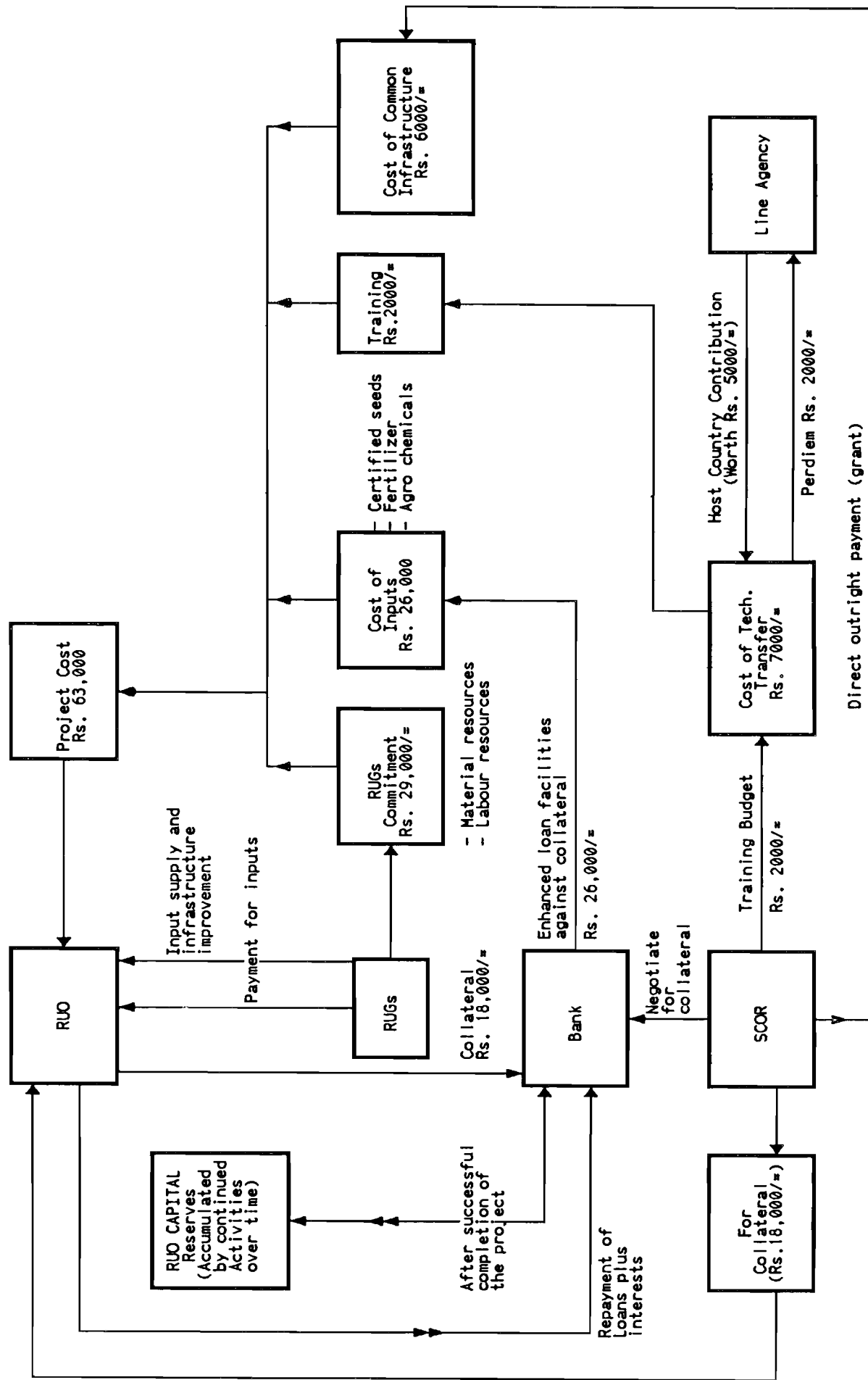


Figure 1



# FLOW OF FINANCIAL ASSISTANCE TO RUGS THROUGH RUO FOR COLLECTIVE ACTION

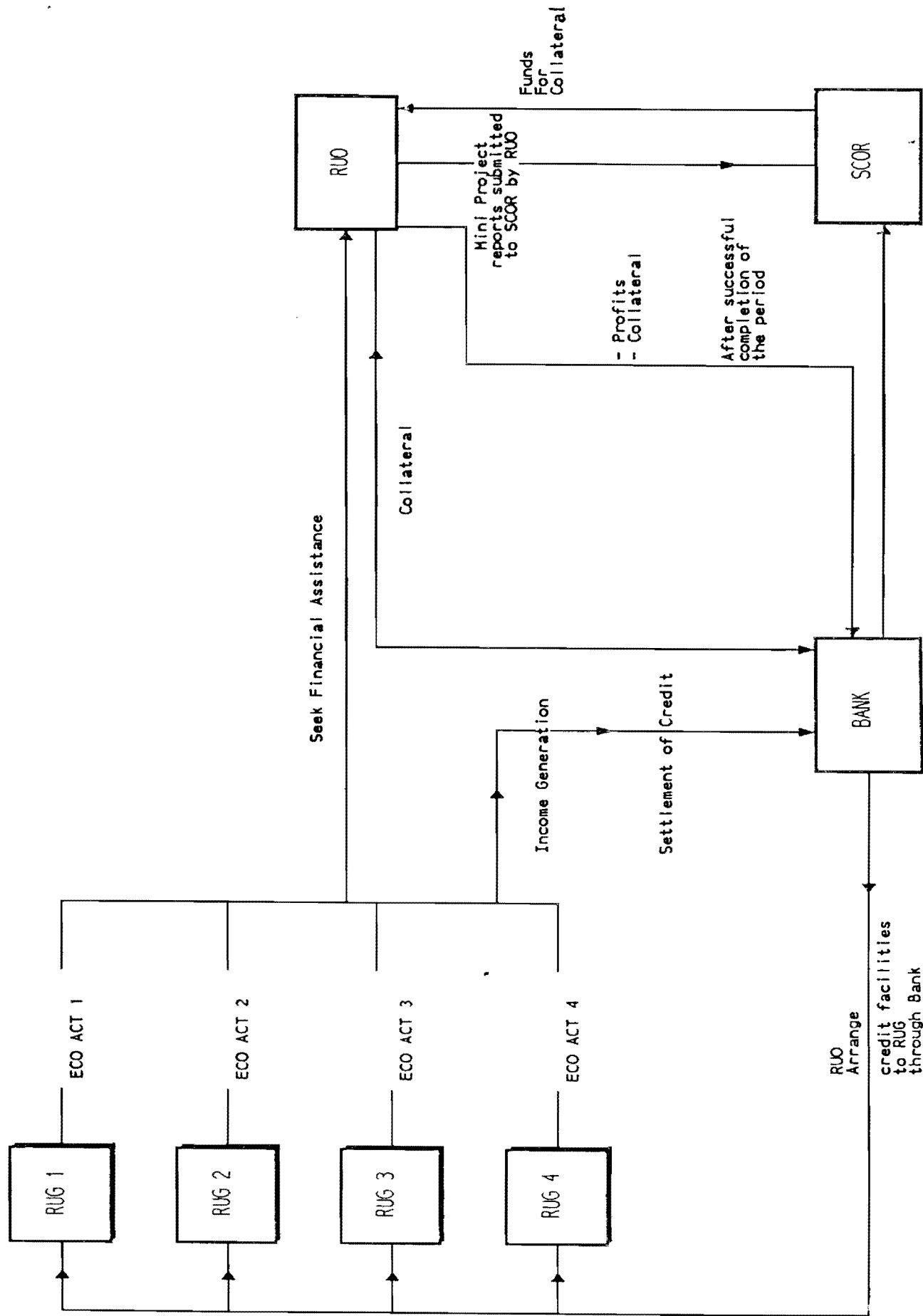
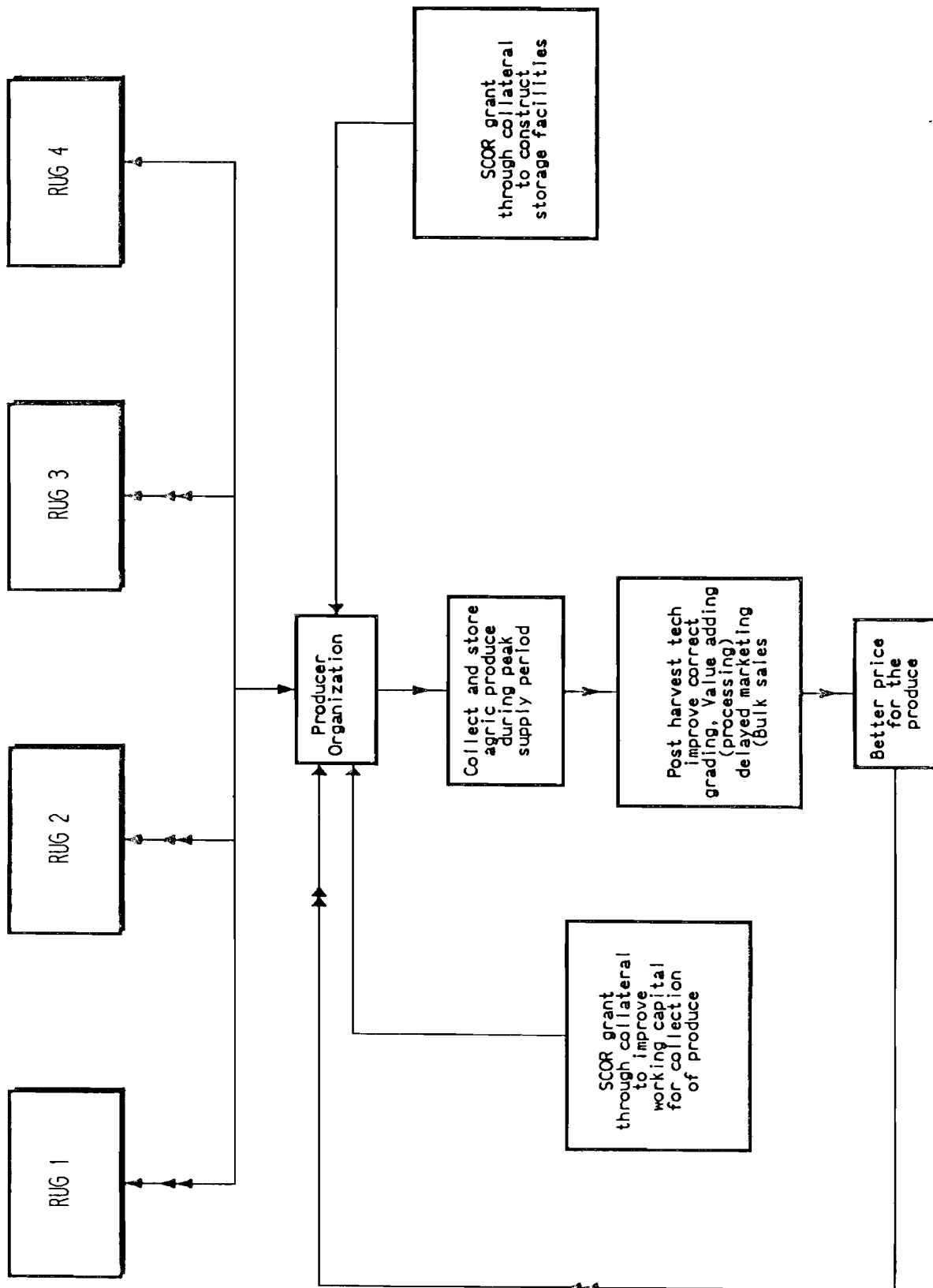


Figure 2

# SCOR GRANTS TO PRODUCER ORGANIZATIONS FOR MARKETING OF PRODUCE

Resource use adopting agronomic practices in their small holdings who have little produce of other crops



ගිවිසුම් පත්‍රය

ජාත්‍යන්තර වාටි කළමනාකරන ආයතනයේ මොරටක මිලදු ඇල පිහිටි පිහිටි වසායාති  
කාර්යාලයේ දිවයෙත්ම කළමනාකරන සම්බන්ධිකාරක \_\_\_\_\_ සහ සමිපත්  
පරිහරණ කණ්ඩායමේ නියෝජිත \_\_\_\_\_ මතකා/මය මෙයේ ගිවිසුමකට  
වළැඹෙනු ලැබේ. \_\_\_\_\_ සමිපත් පරිහරණ කණ්ඩායම විසින් ප්‍රධාන ඉල්ලීමට  
ඉදිරිපත් කරන ලද වසායාති වාර්තාවේ දැක්වෙන ක්‍රියාකාරකම් එහි දැක්වෙන කාලසටහනට අනුව  
ක්‍රියාත්මක කිරීමටත්, අපේක්ෂිත වලය නියමිත දිනයේදී ලඟා කර ගැනීම සඳහා කැපවී ක්‍රියා කිරීමටත්  
මෙයින් එකඟවනු ලැබේ.

ඉහත කී ක්‍රියාකාරකම් ඉටු කිරීම සඳහා මුදල, ප්‍රගති සලකා බලා ගෙවීමට කටයුතු කරන අතර,  
එය එා කණ්ඩායම වෙනුවෙන් එකඟවේ.

\_\_\_\_\_ දින පිහිටි වසායාති කාර්යාලයේදී ඉහත සඳහන් පරිදි ගිවිසුමකට වළැඹෙන  
බව මෙයින් සහතික කරමු.

\_\_\_\_\_   
දිවයෙත්ම කළමනාකරන සම්බන්ධිකාරක

\_\_\_\_\_   
සමිපත් පරිහරණ කණ්ඩායමේ නියෝජිත

මිහිදිය සමිතත් පරිහරණ කණ්ඩායමේ වාර්තාව

1. කණ්ඩායමේ නම :
  2. ලිපිනය :
  3. මිහිදිය ව්‍යාපෘති කාර්යාලයේ ලියාපදිංචි අංකය :
  4. කණ්ඩායමේ අරමුණු :
    - 4.1 කෙටි කාලීන අරමුණු :
      - 1.
      - 2.
      - 3.
    - 4.2 දිගු කාලීන අරමුණු :
      - 1.
      - 2.
      - 3.
  5. මිහිදිය ව්‍යාපෘතිය යටතේ අනාගතයේදී බිහිවන සමිතත් පරිහරණ සංවිධාන/උපසහාය/සහාය සමග ව්‍යුහගතවීමට එකඟ විය යුතුය. (මෙහිදී සේවා සැපයුම්, නිෂ්පාදනය, ගබඩාකරණය, නිෂ්පාදන සැකසුම් හා අලෙවිය වැනි කටයුතු සෑදීමට අවශ්‍ය ක්‍රියාකාරකම් වඩා කාර්යක්ෂම හා ඵලදායී කර ගැනීමෙන් සමිතත් කළමනාකරණ පරිපාටිවලට පුළුල් කර ගැනීමට අපේක්ෂා කෙරේ.)
  6. ජලය සහ භූමිය වැනි ස්වාභාවික සම්පත් සාමූහික කළමනාකරණය සාමාජිකයින්ගේ අවධානය යොමු කළ යුතු අතර ජනතාව සමග හිටිසමීරයට එළැඹීමට ද කටයුතු කෙරේ.
  7. හැකි සෑම විටම සමිතත් පරිහරණ කණ්ඩායම (RUG) විසින් බැංකු ගිණුමක් විවෘත කර කණ්ඩායමට ලැබෙන මුදල් ප්‍රදානය, සාමාජික මුදල් හා රෙගුලාසි කණ්ඩායම නමින් එම බැංකු ගිණුමෙහි තැන්පත් කළ යුතුය.
- බැංකු ගිණුම \_\_\_\_\_ පිහිටි \_\_\_\_\_ බැංකුවේ  
\_\_\_\_\_ ගබඩාවේ විවෘත කරනු ලැබේ.
8. බැංකු ගිණුමෙන් මුදල් ආපසු ගැනීමේදී කලින් දෝරනා සම්පතයෙන් නිසි කර ගන්නා ලද සාමාජිකයන් දෙදෙනෙකුගේ අත්සන් ලබා ගත යුතු අතර, මුදල් ආපසු ගැනීමට මිහිදිය ව්‍යාපෘති විධායකාරක නිර්දේශය බැංකුව වෙත ඉදිරිපත් කළ යුතුය.
  9. කණ්ඩායමේ සාමාජිකයන් නාම ලේඛනය ඇමුණුම අංක (1) හි දැක්වේ.
  10. මිහිදිය 'නිල්වලා ව්‍යාපෘති' කණ්ඩායමේ නිර්මාණය වූ පිළිගත් ව්‍යාපෘති සැලැස්මකට අනුව අවශ්‍ය අවස්ථාවන්හි සැලැස්මේ ඒ ඒ පිටපතක් සඳහා කණ්ඩායමේ පොදු කාර්යයන් වෙනුවෙන් ප්‍රදානය කෙරුණු රහස්‍යයන් නිදහස් කරනු ලැබේ.

**SCOR PROJECT – HURULUWEWA**  
**WORK PLAN (NOVEMBER 1993 TO SEPTEMBER 1995) – INDICATORS**

MAJOR INTERVENTION	OUTPUT	INDICATORS
(1) STABILISATION OF CHENA AND ENCROACHED STATE LANDS.		
(a) Conservation farming Awareness Programme Training Of Officers/ Users Demonstrations Workshops Visits /Field Days School Programmes	Officers—125 Farmers 1000 15 04 Farmers 1000 Awareness created among school children	Increased awareness indicated in before after assessment
(b) Stabilisation of chenas	20 Ha. from each User Groups (2000 ha.)	Tree density
(c)		Yield of chena crops
		Profits
		Water infiltration
		Soil loss
		Moisture retaining capacity
		Soil fertility
		# of Formal agreements
		Investments
		Permanent crops
		Extent freed from encroachments
Conservation of Channels, Roads, Streams and Tank Bunds.		
Channels	30 k.m.	# of eroded locations conserved
		# of groups formed
		# of usufructuary rights granted
Roads	15 k.m	# of trees surviving
		# of eroded locations conserved
Streams	25 k.m.	Tree density
		Plants by type
		Reservaton extent demarcated
		# of vulnerable sand mining locations conserved
		# of formal agreements
		# of permanent crops
		# of scoured sections conserved
Tank Bunds	05 k.m	

(2) REGENERATE TANK ECO-SYSTEM

(a) Awareness Programme

Demonstration Established

1 Demonstration

Awareness level

Training (Officers/Users)

Officers 30  
Farmers 1000

Awareness level  
Farmer willingness to adopt  
conservation

School Programme

Schools – 22  
Students – 3750

Awareness level

Visits/ Field Days

Farmers 500

Awareness level

(b) Conservation of chenas in  
Catchments

320 ha of chena areas in  
tank catchments  
conserved

Tree density  
Yield of chena crops  
Profits  
Water infiltration  
Soil loss  
Moisture retaining capacity  
Soil fertility  
# of Formal agreements  
Investments  
Permanent crops

(c) Establishment of Nurseries

Nurseries established in  
each locations (Total 35  
Nurseries)

# and type of plants produced  
# and type of plants distributed

(d) Restoration of  
Gasgommana

30 ha in 2 tanks

# of trees surviving  
Extent covered by trees

Perahana

Extent of ground cover  
Sediment inflow  
Water quality

Kattakaduwa

Tank

Extent restored  
# and type of recommended plants surviving  
Water quality  
Aquatic bio-diversity  
Water quality  
Food basket value

### (3) INTEGRATED WATER MANAGEMENT

(a) Formation of Farmer Organisations from Lenadora to Ilukwawe under one Agency	Strengthening of existing organizations IMD – 23 DAS – 26 New organizations – 10	Registered membership participation in meetings % of conflicts resolved within group # and % of decisions implemented Farmer participation in seasonal planning Adherence to cultivation meeting decisions Group action in farm input procurement and output marketing Increased adoption of conservation farming
(b) Feeder Canal  Inclusion of Huruluwewa Officials in Mahaweli Water Panel	Release of full quota assured (150 cusecs)	Credibility Reliability of water inflow
Operation and maintenance of the feeder Canal	(a) Handover the full feeder canal to ID/ Huruluwewa (Except 1st 5 miles)	Credibility Reliability of water inflow Joint O&M
Coordination among F.OO. in the System	Supply of 90 cuses to Huruluwewa assured	Credibility Reliability of water inflow # of conflicts resolved
Establishment of appropriate cropping systems.	Appropriate cropping systems in 5 ha established	Production by type Yield Farmer acceptance level
(c) Command Area Crop diversification during Maha and Yala	Yala – 1500 ha Maha – 1000 ha	Water use efficiency Profitability Cropping intensity Crop yield index Water productivity Land productivity Residual tank storage Farmer acceptance level

On – farm Water Management

Conjunctive Use of  
Water

Conjunctive use tested in  
tract 6

Water use efficiency  
Extent irrigated  
Cropping intensity  
Farmer acceptance level  
Formal adoption by ID  
Irrigation water demand

Timely Cultivation

Commence Yala before mid  
April (new year) and Maha  
with first rains commencing  
from October onwards

Water use efficiency  
Shortened period of cultivation season  
Residual tank storage  
Farmer acceptance level

Irrigation Scheduling

Irrigation scheduling  
developed, implemented,  
and monitored commencing  
from Yala 1994 season

Water use efficiency  
Water productivity  
Adequacy of supply  
Reliability of supply  
Farmer acceptance level  
Farmer participation level  
Formal adoption by ID

Operation and  
Maintenance of the System

Identify and rectify O&M  
problems in tract 6 through  
user participation

Water availability  
Extent irrigated  
User share in O&M  
Water use efficiency

Efficient System  
Management

Coordinate activities of small  
tanks in the command within  
Huruluwewa scheme

One sub – council formed  
including the  
representatives of small  
tanks of Huruluwewa

Water use efficiency  
Extent irrigated  
Water productivity  
Attendance of representatives at sub –  
user council meetings.  
# of conflicts resolved

(d) Drainage Area

Utilisation of drainage  
Water of Huruluwewa

Drainage water utilization  
improved in 300 ha

Drainage water use efficiency  
Production  
Cropping intensity  
Profitability

On – farm Water Management



Establishment of appropriate cropping systems

Introduce cropping patterns for drainage area of 300 ha

User groups formed for drainage waterutilization  
Integration of RUGs in the drainage area with those of the command area

(4) SHARING RESOURCES FOR IMPROVING HOMESTEAD

(a) Establish three Commercialized plant nurseries

(Fruits, Forests and Gliricidia Seedlings)

3 nurseries

# and type of seedlings produced  
# and type of seedlings sold  
Annual turnover from nurseries

(b) Establish Model Homesteads

28 model Homesteads

Tree density  
Moisture retention capacity  
Soil fertility  
Soil loss  
Income/family  
# and type of trees  
Ground cover  
Farmer adoption level

(c) Expansion of Homesteads due to spread effects

112 additional homesteads emerged  
250 house holds benefitted

Tree density  
Moisture retention capacity  
Soil fertility  
Soil loss  
Income/family  
# and type of trees  
Ground cover  
Farmer adoption level

(d) Livestock Improvement of Milk production

500 heads of cattle  
250 farm families benefitted

Average milk production  
Cattle population  
Milk consumption  
Income/family  
Organic matter (manure) produced

Processing of milk and Establish market links

2 processing units  
250 farm families benefitted

Value added  
Income/family  
Employment generated  
# of Forward and Backward linkages  
# of products by type

Promotion of goat rearing

150 heads of goats  
75 farm families

Average milk production  
Goat population  
Income/family  
Organic matter produced  
Crop/livestock integration level

(e)	Promotion of apiculture	Introduction of 300 bee colonies	Bee honey production # of Bee colonies Income/family
(f)	Promotion of medicinal herbs	Medicinal herbs— 5 ha.	Production Sale Income Farmer adoption level
(g)	Establishment of Fruit villages	2 villages	# and type of fruit trees surviving Extent covered Farmer adoption level
(h)	Promotion of Agro-based industries	4 industries	Production Income Employment Backward and forward linkages
(5)	GROUND WATER DEVELOPMENT AND MANAGEMENT		
(a)	Research on ground water	Ground Water potential assessed and recommendations on ground water use made	knowledge on ground water potential knowledge on ground water use Well density established Ground water use efficiency Ground water quality Service area under an agro-well Net return from agro-well Formal adoption of recommendations by the agencies Adoption of conjunctive use by the users
(b)	Providing necessary services through user groups	5 user groups providing services	O&M cost Construction cost Income to user groups Level of sharing of pumps and accessories by users
(6)	LAND CONSOLIDATION IN MINO		
		Increase Land Use efficiency & Increase Cropping intensity.	
	Formation of user groups	15 user groups formed	Farmer acceptance level
	Innitiate land consolidation	5 tanks	Farmer acceptance level

Consolidation of ownership	1 tank	Water productivity water use efficiency Yield Land holding size Land fragmentation trend Farming time saved Improved cultivation calendar Fallow area
(7) INTEGRATED PLANNING AND COORDINATION		
Promote inter-agency collaboration	An integrated watershed management plan developed	Agency acceptance level Agency commitment level
Promote inter-project coordination	WRMT institutionalized as coordinating mechanism at DS level	Quality of planning # of conflicts resolved Attendance of key officials at coordinating meetings  Multi disciplinary nature of the WRMT Level of sharing resources among agencies Data base Agency commitment for integrated land and water resource management Level of exchanging at DS level
Coordination at centre, Provincial Council and Divisional Levels	NSC/PSC/DS coordination institutionalized as a coordinating mechanism	Speedy resolution of issues Policy changes Involvement in land and water resource management
Coordination with Local Political Leadership	Awareness created among local political leaders	Support and commitment to plan Local resource allocation to supplement land and water resource management efforts
Promote integrated efforts of NGOs and private firms	A number of NGOs and private firms involved in production and protection	Investment by NGOs Investment by private sector firms Formal linkages of NGOs and private firms with DS/WRMT
Promote user participation in integrated management of land and water resources	10 user organizations integrated to the watershed resources management planning	User participation in planning

# SCOR PROJECT - LOGFRAME

## GOAL

Increase the sustainable productivity of  
land and water Resources  
"PRODUCTION AND PROTECTION"

↑  
other  
factors

## "SUB GOAL"

Land and water users adopt more  
sustainable and productive practices

↑  
other  
factors

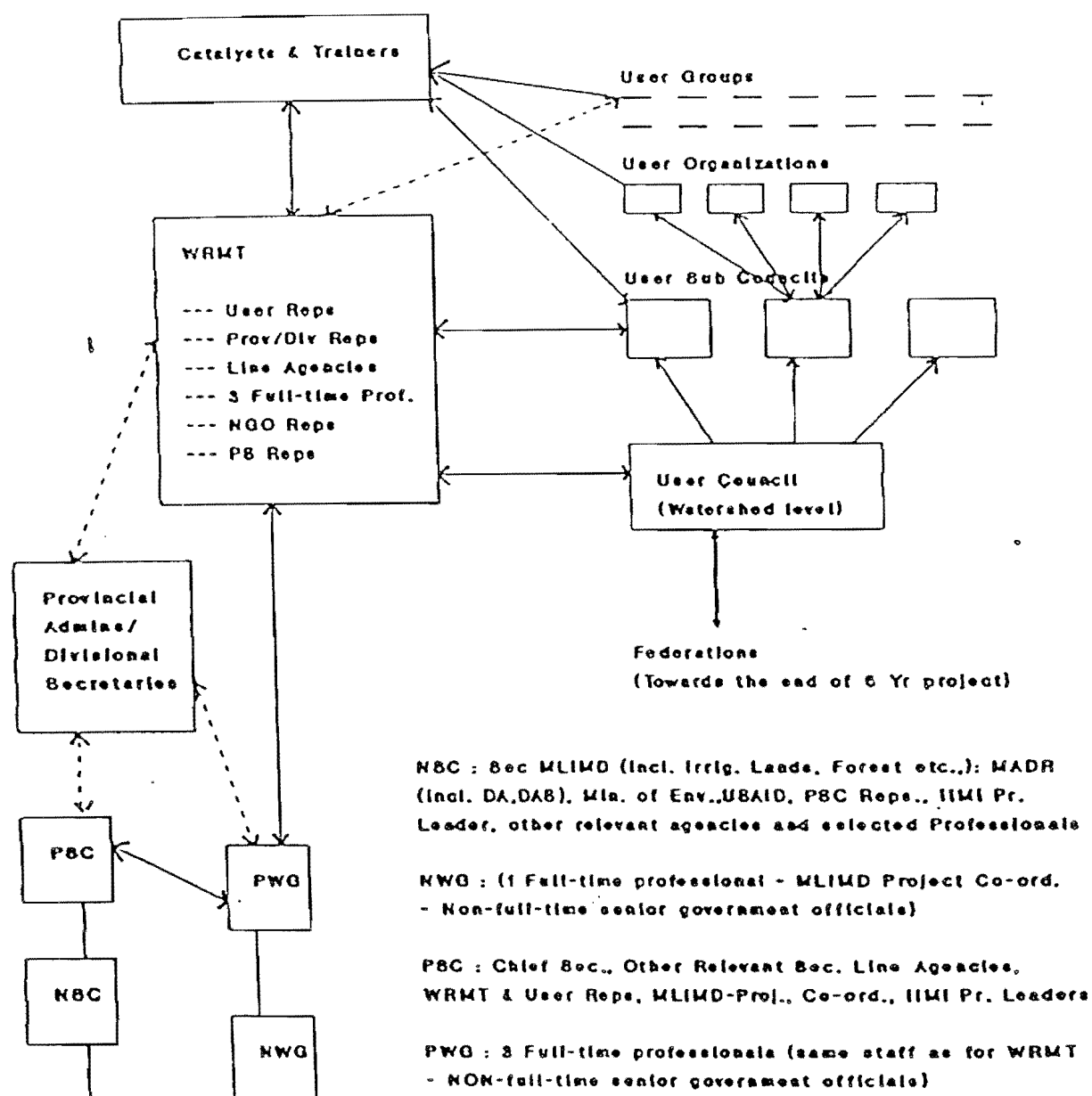
## PURPOSE

Increase Shared Control of Land  
and Water Resources

## ACTIVITY AREAS

- \* Strengthen user group capabilities
- \* Improve Resource Tenure Arrangements
- \* Strengthen government, NGOs and private sector capacities
- \* Improve Co-ordination and Linkage -  
"Projects to Program"

Figure 5 - SCOR Project Organizational Structure

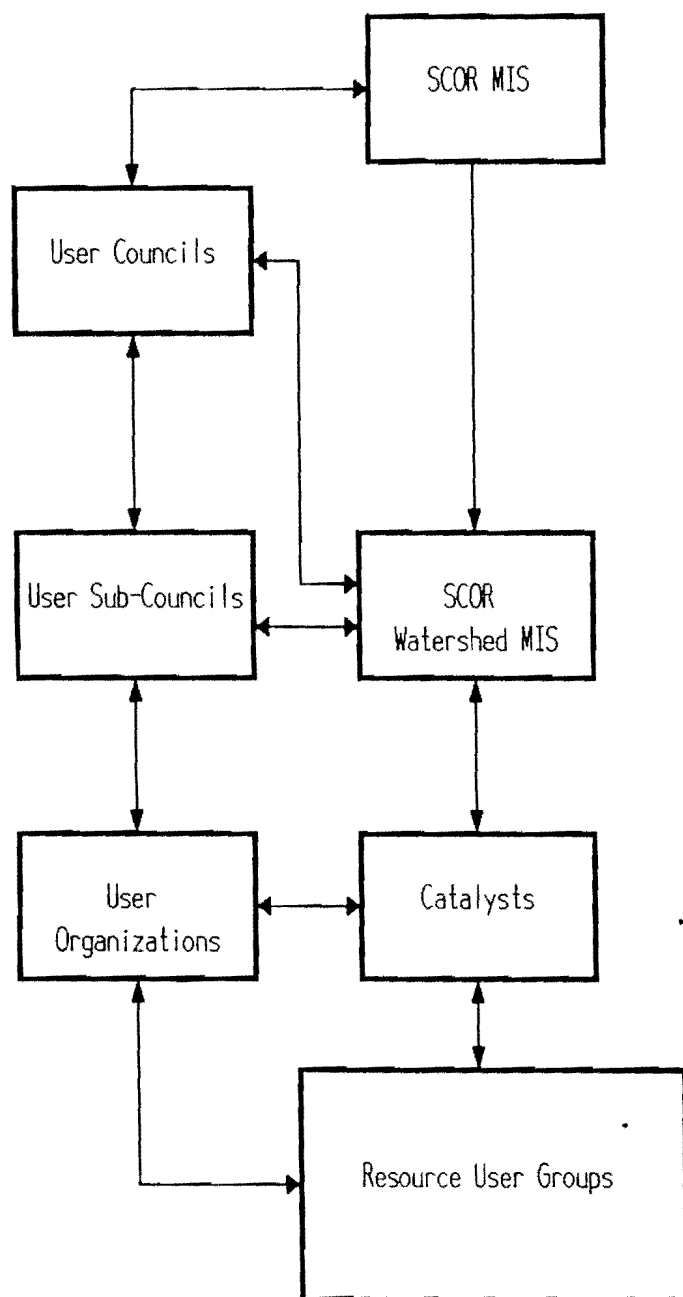
**Legend :**

WRMT - Watershed Resources Management Team  
 PBC - Provincial Steering Committee  
 PWG - Provincial Working Group  
 NBC - National Steering Committee  
 NWG - National Working Group  
 PROV - Provincial

REPS - Representation

PB - Private Sector

## Monitoring & Evaluation Process - SCOR Project



### Major Output

Periodic Physical  
Financial Progress Reports

Status Review Reports  
Evaluation Reports

Research results  
Documents

Process Documentation

Activity Status  
Recording

MIS = Management Information System