PROPOSED GOSL/USAID PROJECT FOR SHARED CONTROL OF NATURAL RESOURCES (SCOR)

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SHARED CONTROL OF NATURAL RESOURCES (SCOR) PROJECT

PROJECT PAPER

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Core Group of Senior Government Officials.
(See Annex XI)

Contents

Project Data Sheet

Project Authorization

Name of the Country: Sri Lanka

Name of the Project: Shared Control of Natural Resources (SCOR)

Number of the Project: _____

Acronyms

ADB	Asian Development Bank
ADA	Agricultural Development Authority
AGA	Additional Government Agent
ARTI	Agrarian Research and Training Institute
CEA	Central Environment Authority
CEQ	Council on Environmental Quality
ECC	Environmental Coordinating Committee
EIA	Environmental Impact Assessment
DAS	Department of Agrarian Services
DGA	Divisional Government Agent (now AGA)
DS	Divisional Secretary
DCC	District Coordinating Council
FD	Forest Department
FO	Farmers' Organization
GA	Government Agent
GIS	Geographic Information System
GOSL	Government of Sri Lanka
IBRD	International Bank for Reconstruction and Development (World Bank)
ID	Irrigation Department
IMD	Irrigation Management Division
IMPSA	Irrigation Management Policy Support Activity
INMAS	Integrated Management Program for Major Irrigation Schemes
IQC	Indefinite Quantity Contract
ISMP	Irrigation Systems Management Project
LIS	Land Information Systems
LUPPD	Land Use Policy and Planning Division
MASL	Mahaweli Authority of Sri Lanka
MADR	Ministry of Agriculture Development and Research
MEP	Mahaweli Environment Project
MEPA	Ministry of Environment and Parliamentary Affairs
MIS	Management Information System
MLIMD	Ministry of Lands, Irrigation and Mahaweli Development
MLLA	Ministry of Lands and Land Alienation
NAREPP	Natural Resources and Environmental Policy Project
NARESA	Natural Resources, Energy and Science Authority
NEA	National Environment Act
NGO	Nongovernmental Organization
NORAD	Norwegian Development Cooperation
NWG	National Working Group
NSC	National Steering Committee
PC	Provincial Council
PID	Project Identification Document
PWG	Provincial Working Group
PSC	Provincial Steering Committee
TARC	Tropical Agricultural Research Centre
TOR	Terms of Reference
UG	User Group
WRMT	Watershed Resources Management Team

THE PROPOSED GOSL/USAID PROJECT FOR SHARED CONTROL OF NATURAL RESOURCES (SCOR)

SUMMARY

Project Rationale:

The Government of Sri Lanka has recognized the urgent need for more intensive, but environmentally appropriate, utilization of its natural resources base, particularly land and water resources, for profitable and sustainable agricultural and related industrial production. Many efforts at fulfilling this need are already underway. However, four types of major constraints inhibit these efforts.

a) The lack of a production environment that permits the resource user to effectively manage the combination of resources essential to maximize economic production;

b) The lack of an effective combination of education, incentives and mechanisms to enforce penalties that induce internalization of environmental considerations into management decisions;

c) The lack of adequate information about the land and water resources at appropriate levels; and

d) Institutional constraints including inadequate co-ordination among projects/activities of land and water resources development.

Over a 6-year project duration, SCOR Project will attempt to overcome the above constraints. It will promote sustainable development in selected pilot watersheds in the North Central and Southern Provinces through an increasingly productive agriculture sector functioning within healthy social and natural environments. This will be achieved through **expanding and strengthening the role of the small holders in agriculture, as individuals and groups, in the management and control of the natural resources fundamental to the agriculture sector - primarily land and water. In essence, the SCOR Project is aimed at introducing and institutionalizing participatory management strategies to strike a proper balance between production and protection of land and water resources.**

The SCOR Project is based on the fundamental premise that a **progressive increase of users' share of control over natural resources (particularly land and water) is a vital means of guaranteeing more productive, profitable, equitable, and sustainable agricultural production in Sri Lanka.**

The interventions of SCOR will focus on formulating, pilot testing, and application of specific land and water rights, strengthen the technical and managerial capabilities for natural resources management, assist the users in structuring their agricultural activities for greater profitability, strengthen the capacities of local and intermediate level administrative and governmental bodies to interact positively with the resource users , and improve those aspects of national policy and structures necessary to implement the shared control of natural resources management.

2. The Design Process.

This Project Proposal is the product of a novel participatory project design process spearheaded by a Core Group of senior government officials who are closely associated with the management of land and water resources of Sri Lanka, and nominated by the Secretary, Ministry of Lands, Irrigation, and Mahaweli Development. The design process was funded by the United States Agency for International Development (USAID) and facilitated by the Sri Lanka Field Operations of the International Irrigation Management Institute (IIMI/SLFO).

The three-month design process included a review of past experiences in the management of natural resources in Sri Lanka and elsewhere, a series of consultations with a cross section of resource user groups, government officials, representatives of non-governmental organizations at all levels in two selected provinces,viz. the NCP and the SP, two participatory project design workshops for provincial officials, two workshops for national/provincial level policy makers and selected resource consultants and technical assistance from IIMI/SLFO staff and three international resource consultants.

The Project design was developed as part of a major on-going USAID-assisted Project, viz. The Natural Resources and Environmental Policy Project (NAREPP) which addresses basic national environmental policy and implementation issues. SCOR's activities will respond to related issues in the land and water resources sector which are not specifically addressed by NAREPP.

3. The Goal, Purpose and Objectives.

The Project **goal** is to increase the sustainable productivity of the natural resources base in Sri Lanka in ways that will improve people's livelihoods beneficially and equitably now and in the future with due regard for the environment.

The Project **purpose** is to enhance the share of user control over natural resources (land and water) through state-user partnerships that contribute to intensified and sustainable agricultural production while protecting the physical, biological and social environments.

The Project **objectives** are:

To improve the **incentive and institutional context** in which agriculture and other commercial activities are undertaken in the selected watersheds, so as to ensure both productivity and sustainability;

To get resource user groups and managers to consider **environmental implications** of land and water use more explicitly and to internalize environmental considerations in decision-making and implementation at all levels;

To enhance governmental, group and individuals' **information and understanding** about potentials of and prospects for natural resources base for production and protection; and

To strengthen the capacity of the Provincial /Divisional level government authorities in **planning for land and water resources utilization in an integrated manner**, gradually transforming the strategy of development of land and water resources **FROM A "PROJECT MODE" TO A "PROGRAM MODE".**

4. Project Approach

The key elements of the Project approach are outlined below:

a) The **basic planning, coordination and implementation units** for project operations will be the **Watersheds** in the two pilot areas selected for project operation, viz. the NCP and the SP.

b) All project **activities** will be geared **to strengthen the concept of shared productive control** of land and water resources through state-user partnership.

c) The **participatory planning and implementation** approach involving resource user groups, agencies of government and private sector and NGO actors will be intensified and institutionalized.

d) Users' capacity and capability to exercise shared control will be enhanced through **strengthening user groups.** Activities such as assisting in creating economic and commercial opportunities, improving access to information, improving resource tenure, promoting legal recognition and powers, and improving regulatory and legal mechanisms will be undertaken as these are required for strengthening user groups. **Effective links** between user groups and private agencies (including NGOs) will be promoted.

e) **Assistance** will be provided **to (i) users** to increase their technical and organizational ability to interact effectively with agencies and enterprises **and (ii) agencies** to improve their capacity to serve the users adequately.

f) The **capability of government agencies**, at different levels, **for planning, co-ordination and implementation** of land and water management programmes in an integrated manner **will be enhanced.**

g) The Project **will work concurrently at three different levels:**

i. At the National level to improve policies and processes and to support the implementation of programs where an adequate knowledge base exists.

ii. At Provincial and Divisional levels in the two selected provinces to strengthen institutional capabilities.

iii. At watershed levels to develop practical field-tested methods of organization, planning, execution, monitoring and evaluation.

However, the Project will **commence implementation from the watershed level,** and policy/legal reforms will be undertaken at higher levels, if they are found to be obstacles to field level activities.

h) The Project will have a **phased-withdrawal of external assistance** while ensuring a high degree of **internalization of processes** and practices which will have proven qualities of sustainability.

i) The Project will have mechanisms to **augment/expand the spread-effects** of its tested innovations.

5. The Main Areas of Project Operation

Most of the Project activities will be implemented in the watersheds while others will be undertaken at the divisional, provincial and at national levels.

The Project will work in a number of watersheds in the two pilot Provinces, covering a total area of about 30,000 hectares. The Huruluwewa watershed (covering the Divisional Government Agent's areas of Galenbindunuwewa and Palugaswewa) in the NCP, and the uppermost watershed area of the Nilwala river basin (covering the Divisional Government Agent's area of Kotapola) in the SP have been identified as the first set of watersheds for project implementation. The rest of the watersheds will be identified as experience is gained through work on the first watersheds.

6. Project Activities

The Project will implement activities under four broad areas as stated below, to achieve the Project objectives.

6.1 Strengthening the capabilities of resource user groups to participate in planning, management and shared control.

a) Survey of Existing Local Organizations (in pilot areas)
b) Constraints Analysis (in pilot areas)
c) Legal Status and Powers for User Groups
d) User Group Creation (in pilot areas)
e) Training for User Groups and Trainers
f) Economic Opportunities for User Groups
g) Special Opportunities for Women and Youth
h) Supporting Services and Facilities for User Groups
i) Production Companies.

6.2 Improving land and other resource tenure arrangements in ways that will further production and conservation goals for the country.

a) Regulatory and Legal Mechanism
b) Resource Access and Tenurial Arrangements
c) Policy and Process Reform
d) Land Titling
e) Land Consolidation

6.3 Strengthening government, NGO and private sector capacities to support resource planning, management and shared control at different levels.

a) Information Systems
b) National Departments and Agencies
c) Provincial Councils and Staffs
d) Divisional Offices and Line Agency Staffs
e) Strengthening of NGOs
f) Strengthening of Private Sector and Banks

6.4 Improving coordination and linkage among agencies, donors, levels of government, resources uses and users with respect to shared control.

a) Multi-Level Planning in pilot watersheds
b) User Group Federations in Watersheds (in pilot areas)
c) Administrative Mechanisms for Watersheds (in pilot areas)
d) Provincial and Divisional Planning and Implementation
e) Government Agencies and Donors
f) Coordination Among Projects
g) Establish information systems.

7. Project Outputs

7.1 Capabilities of User Groups Strengthened

1000 user groups, 100 user organizations, 15 sub-user councils and 4-6 watershed councils created/strengthened in pilot areas.

3000 representatives of user groups, 100 from user organizations and 20 from User Councils and Sub Council have received formal training in such areas as group dynamics and leadership, resource use planning, sustainable practices, organizational and financial management and marketing.

40 selected users' organization representatives have completed study Tours abroad.

30 different modes of existing and/or new commercial opportunities for user groups developed and/or supported.

10 Production companies representing different models for intensifying production in watersheds in sustainable and environmentally sound ways established on an experimental basis.

300 rural-based commercial activities and 10 production companies linked to new markets, and revolving funds and schemes for providing matching grants established to assist commercial activities.

100 user organizations within the pilot area are conferred with legal status and powers and a larger number outside, through spread mechanisms.

7.2 Resource Tenure made more secure for users

Policy, legal and regulatory changes enacted enabling increased control by users.

Land tenuring process accelerated.

Rationale for land consolidation demonstrated in 30 small tanks.

7.3 **Government, NGO and Private sector capacities strengthened and better able to support users and user organization**

Improved resources use information and monitoring system developed and resources user's operations monitored.

20 national, 50 provincial and 150 divisional level officials made aware of and trained in local level planning, providing assistance to user groups and coordination.

100 representatives from NGOs/private sector trained in participatory natural resources management.

NGOs and other private sector organizations providing technical, managerial and commercial information to user groups.

4 national, 6 provincial and 15 divisional level officials complete short study tours abroad.

4 provincial and 6 divisional level officials have received short-term training abroad.

7.4 **Improved co-ordination and linkages among users and agencies.**

Improved methodologies and tools developed and applied for multi-level planning.

Groups/organizations supporting and promoting planning and coordination in pilot watersheds.

Land and water use plans for pilot watersheds produced through participatory mode. (user groups, NGOs, Government and provincial staff, private sector staff and donors, if any)

Institutional mechanisms to coordinate and support land and water management practices made operational at provincial and national levels.

8. Project Inputs

The Project will provide long-term and short-term technical assistance to cover institutional development, agro-forestry, irrigation, enterprise development, strengthening participatory management policy analysis, and other needs mainly at the watershed level. It will provide for a limited number of sub-contracts involving consultants for assistance in relation to resources tenure issues, and one or more NGOs in Sri Lanka to manage and provide assistance in the area of group formation, experimentation, and institutional strengthening. The assistance provided for the major project components will cover:

a) Surveys, Analysis and Applied Research;
b) Experimentation and Program Development;
c) Capacity Building and Co-ordination;
d) Training and Education;
e) Policy Dialogue;
f) Commodity, Facility Support; and
g) Performance Disbursements.

9. Finance and Budget Plan

The Project will be financed from three sources. viz:

a) Direct USAID,
b) PL 480 Account; and
c) GOSL and other local contributions.

A total of US $ 7.34 million will be provided by USAID over the project period of 6 years (FY 93 through FY 98). The composition of financing will be as follows:

Technical Assistance (including all support staff)	57.0
Training (local and foreign)	6.1
Planning, M&E, and Spread Mechanisms	1.7
Sub-grants (User Groups 2.5, NGOs and private sector 1.4. and Provincial and Divisional Secretariats 1.4)	5.3
Special Studies	2.7
Equipment and Commodities	3.4

Information, Education and Communication (IEC) material	0.7
Operation and Maintenance of Offices and Vehicles	8.8
Contingencies	4.3
Inflation	10.0
	100.0

It is expected that approximately US $ 2,000,000 will be provided under PL 480 Title III Programme to supplement the above activities and an additional amount may also be allocated to provide guarantees against Bank loans to be obtained by the proposed production companies.

GOSL and other Local Contributions in the form of time spent/investments by 25,000 user households and time spent by Senior Government officials/Professionals will amount to approximately US $ 4,000,000

10. Project Implementation

A four-phase implementation programme is planned for each one of the sub-sets of pilot watersheds.

a) Planning and organizing phase - year 1;
b) Experimentation and replication phase - 2nd and 3rd years;
c) Consolidation phase - 4th year; and
d) Internalization and spread effects - 5th and 6th year.

The organizational arrangements for implementing SCOR will emphasize its catalytical and facilitating role. It will provide for a high degree of participation by persons involved in land and water resources and environmental management, at different levels, through planning, implementation and monitoring.

The primary responsibility for Project operation will lie with the Ministry of Lands, Irrigation and Mahaweli Development as the sponsoring ministry, but this responsibility will be shared with other ministries, particularly the Ministries of Agricultural Development and Research, Environment and Parliamentary Affairs and Policy Planning and Implementation.

The Project will be governed by a **National Steering Committee,** within which there will be National and Provincial representation. There will be **Provincial Steering Committees** to provide complementary guidance and direction at the Provincial level.

These Steering Committees will be serviced by **Project Working Groups (PWGs)** at the National and Provincial levels. The National Project Working Group, however, will be an implementing body with one full time, and relevant government officials working on an intermittent basis. Provincial Working Group will have three full-time specialists and relevant provincial level officials working similarly on an intermittent basis.

At the field level **Watershed Resources Management Teams** which will be established as ongoing entities will be the **centrepiece of SCOR project organization structure**. The full-time members of the Provincial Working Group will also work in this group.

The SCOR Project organization is uniquely designed in that stronger organizations (working groups) are at the lower levels where project activities are directed ; lower levels are adequately represented at the higher levels of the hierarchy ensuring vertical integration and effective participation; and, except for the participation of a few specialists in working groups, no new structures are proposed.

11. Project Benefits

The Project benefits are evaluated under the following 11 main categories;

a) Decreased government expenditure on natural resources systems;
b) Improved protection of the environment;
c) Increased user income through expanded agricultural production;
d) Increased user income due to new economic production;
e) Increased income due to new employment opportunities;
f) Increased income due to better marketing;
g) Decreased cost of agricultural production;
h) Increased farmer savings and investments;
i) Enhanced sustainability in the management of land and water resources;
j) Improved coordination, policy reform and awareness-building among agency staff; and
k) Tenure alternatives.

Based on the quantification of the benefits and costs of some selected categories of benefits alone, the estimated benefit-cost ratio at 10% discount rate is 1.43. The IRR of SCOR Project is 19%. If all the benefit streams which are not quantifiable are included, the IRR could be much higher. It can, therefore, be concluded that the investment on the SCOR Project is highly beneficial.

CHAPTER 1: BACKGROUND AND RATIONALE

1.1. Introduction

Sri Lanka's economic development in the foreseeable future will remain heavily dependent upon the effective utilization of its natural resources for agriculture, for power, and for industry. A major portion of Sri Lanka's massive investments in the agriculture sector has been to develop irrigation infrastructure. Undeveloped land suitable for economic expansion of the irrigation sector is very limited. Similarly, there is little undeveloped area of rain-fed land suitable for agriculture. However, the growth of population, while modest by South Asian standards, will continue to increase the pressure for land and water resources. This pressure will be enhanced by the needs of the accelerated development programs currently fostered in the country. Thus, there is an increasing need to intensify production on both irrigated and rain-fed areas, but it should be done in a **sustainable** manner.

Many past efforts, with their emphasis on immediate gains and centralized, but poorly coordinated control, have inadequately addressed the need to manage and utilize the natural resources that are the basis for continued production and development, more efficiently, effectively, and in a sustainable manner. Deforestation and inappropriate hillside cultivation in the watersheds, with resulting erosion, sedimentation, distorted runoff patterns, and decline in water quality threaten the continued benefits of irrigation investment. Intensification of agricultural production, necessary to meet future population and development needs, brings with it possibilities for agravating these problems. In addition, it has the potential to add new ones, such as chemical pollution of important areas of the nation's water resources, especially ground-water, which will be an increasingly important supply for agricultural, as well as domestic, urban and industrial uses.

The Government of Sri Lanka (GOSL) together with the United States Agency for International Development (USAID) and the International Irrigation Management Institute (IIMI), therefore, agreed that a project be designed aiming at striking an appropriate balance between "production" and "protection" in relation to the utilization of land and water resources through the intensification and institutionalization of participatory processes.

This Project Paper draws from the past experience of Sri Lankans and others in the management of natural resources both in Sri Lanka and elsewhere. It builds up particularly on the successful lessons learned from experiments in participatory irrigation management conducted in the past decade and on the premise that enhancing the degree of access to and user control over the land and water resources is critical to improved, sustainable and equitable production.

The paper is the product of a novel **design process** facilitated by IIMI-Sri Lanka Field Operations (SLFO) during the past three months. A Core Group of senior government officials directly involved in natural resources management, who met regularly, spearheaded the design process. A series of consultations with a wide cross section of resources user groups,

government officials and representatives of nongovernmental organizations at all levels (field to provincial) in the North Central Province and the Southern Province of the island was held. Valuable inputs were provided by two workshops for provincial-level officials, two workshops for national-/provincial-level policymakers and by consultations with selected resource personnel in Colombo. In addition to the design team of IIMI-SLFO, three international resource consultants and the USAID staff assisted in the process.

The interventions planned by the Shared Control of Natural Resources (SCOR) Project are designed to promote sustainable development through an increasingly productive agriculture sector functioning within healthy social and natural environments. This will be done through expanding and **strengthening the role of the small holders** in the agriculture sector, as individuals and groups, in the management and control of the natural resources fundamental to the sector -- primarily land and water.

The focus on watershed development is a unique feature of the SCOR Project. The need for integrating the development efforts in the different components of watersheds -- namely, upper catchment areas, reservoirs and anicuts, command areas and highland, and irrigation return-flow areas downstream -- is a basic premise of the SCOR Project. The central arena for project implementation will be the pilot watersheds selected from North Central and Southern provinces. A brief descriptions of the two provinces and the pilot watersheds selected for initial interventions are given in Annexes XII and XIII, respectively. The interventions will be focused on formulating, pilot-testing and applying innovative agricultural production modes. This will speed the transfer of specific land and water rights, strengthen the technical and managerial capabilities of the resources users so that they are better able to assume greater responsibilities for natural resources management, assist these users in structuring their agricultural activities for greater profitability, strengthen the capacities of local and intermediate level administrative and governmental bodies to interact positively with the resource users, and improve those aspects of national policy and ministerial structures necessary to implement SCOR.

In the pilot watersheds, the SCOR Project will take the leadership in bringing the activities (projects, programs, etc.,) based on land and water resources into closer coordination. The Project will strengthen the capacity of the Provincial administration and the Divisional Secretariats in integrated planning for the utilization of land and water resources in the watersheds. The institutionalization of such an approach will **shift the strategy of development of land and water resources from an uncoordinated "project mode" to a well-coordinated "program mode."**

Even though the SCOR Project will utilize a limited number of watersheds in its learning and development stages, it is anticipated that implementation will be on a much wider area. Toward this end, a significant spill over or "spread-effect" is expected as a **low-cost expansion** of the adoption of innovations tested and introduced by the SCOR Project. Two processes are relevant here:

a) autonomous expansion once the validity of the SCOR approach is demonstrated;
b) augmentation of spread-effect by a well-designed program/mechanism.

Both these will help internalize or institutionalize the SCOR approach. Moreover, the active involvement of the key actors relevant to land and water resources management, (namely users, government agencies, local government bodies, NGOs, and the private sector) at all stages of the project (design, implementation, M&E, etc.) will also lead to reactions consensus among them on activities and processes, and will guarantee a higher degree of sustainability. The autonomous and "planned" spread of the SCOR approach to non-project areas should involve the replication of essential supporting services, as well as the utilization of appropriate practices and processes.

1.2 Organization of the Paper

The rest of the sections of this Chapter discusses the constraints to sustainable productivity in agriculture, outlines the focus of the SCOR Project and its relationship to GOSL/USAID development strategies. Chapter 2 describes the goals, objectives, approaches, activities, organization and the inputs and outputs of the Project. **Chapter 3** deals with the Finance and Budget Plan. The Project is estimated to cost US $ 16 million out of which US $ 9 million will be budgetary support, over its 6-year period of operation. **Chapter 4** details the implementation and monitoring plan. It includes the details of the step-wise implementation schedule and the organizational arrangements proposed to be established at the Watershed/Divisional Secretariat level, Provincial level and at the center. It also discusses a plan to institutionalize the tested approaches of the SCOR Project and to expand/augment its spread-effects to other areas. **Chapter 5** outlines the Project Evaluation Plan. There are 13 Annexes to support the contents of this paper. They are:

I. Statutory Checklists
II. Logical Framework
III. Technical Analysis
IV. Economic Analysis
V. Constraints Analysis
VI. Social Soundness Analysis
VII. Institutional Administrative Analysis
VIII. Environmental Analysis
IX. Other Donors' Activities
X. Performance Disbursement Criteria and Benchmarks
XI. List of Core Group Members

XII. Description of the North Central Province and the Southern Province
XIII. Description of the Watersheds Selected in the North Central Province and the Southern Province

1.3 Constraints to Sustainable Increases in Agricultural Productivity and the Focus of SCOR Project

Four types of major constraints exist in relation to the environmentally appropriate increase in production:

a) The lack of a production environment that permits the resource user to effectively manage the combination of resources essential to maximize economic production;

b) The lack of an effective combination of education, incentives and mechanisms to enforce penalties that encourage internalization of environmental considerations into management decisions;

c) The lack of adequate information about the land and water resources, at appropriate levels.

d) Institutional constraints including inadequate co-ordination between projects/activities of land water resources development.

1.3.1. An Inappropriate Production Environment

Essential to sustainable production is sufficient security of tenure for farmers to utilize specific areas of land over an extended period. This reduces the temptation for exploitative land use, and permits recovery of investment in production and environment protection practices that takes relatively long cost-recovery periods. Security of tenure is usually assured by ownership title, but other mechanisms are available to provide effective security. Settlement schemes offer de facto security, as do various types of traditional tenancy.

However, the security of tenure alone is not sufficient to ensure that farmers will make economically and environmentally sound decisions. The size of the operating holding should permit viable and sustainable production. While there is evidence that there are individual small holdings which are or could be made economically viable, very small fragmented holdings are, generally, not conducive to either optimization of agricultural practices or to the application of environmental protection practices. Large operating holdings could permit a reasonable degree of optimization in the use of the available natural and human resources. However, the resources of individual holdings could be pooled together to bring about the same advantages without changes in tenurial rights.

There must be a supportive production environment. Production inputs, such as credit, seeds, fertilizer and technical information must be available at reasonable effort and cost. The total costs to farmers, particularly small holders, often include a high proportion of "transaction costs," those monetary and non-monetary payments that are associated with obtaining necessary

approvals, ensuring timely availability of inputs, etc. These costs frequently result in decisions significantly different from those that would result if they did not constitute a factor.

Customary economic incentives, such as product prices and market stability must also be such that production of resource appropriate crops can be profitable. Government policies on price fixing, property rights, importation of agricultural products, and other forms of regulation of agriculture and natural resources influence farmer decisions. These influences can produce positive or negative effects on the utility of the natural resources.

1.3.2. Failure to Consider Environmental Impacts

Sri Lanka has a long history of cultural sensitivity to the environment. Unfortunately, the combination of increased population pressure, increased urbanization, the push for development and modernization, and inappropriate government policies has seriously eroded this sensitivity. The impact of this loss, expressed in accelerated environmental degradation, is difficult to address in the agriculture sector, especially in the small-holder subsector. The typical processes used for environmental protection in the industrial sector -- establishment of environmental standards, monitoring of impacts, and enforcement of rules -- can be effective because most of the environmental-impacting practices can be identified with the individual producer. In the agriculture sector, particularly in farming, adverse impacts are usually the result of the cumulative effects of the actions of many, and cannot be identified with individuals against whom corrective actions can be taken.

These cumulative effects, such as erosion resulting from inappropriate cultivation practices, pesticide and nitrate contamination of groundwater and nitrate or phosphorous eutrophication of tanks and streams, are the result of decisions made in the normal course of farming. Unless those decisions are informed by the knowledge of potential impact, and unless reasonable alternatives exist for these cultivation practices and the management of those chemicals, environmentally inappropriate decisions will continue to be made.

Other environmental impacts may be the result of failure to use appropriate protection practices because they are technically too difficult or too expensive. Erosion control practices that require physical structures are illustrative. In this case, to reflect and protect public interest, and to encourage its adoption considerable technical assistance, training and new incentive structures may be necessary.

While most agricultural environmental impacts are from non-point sources, some, such as those resulting from inappropriate irrigation, can be identified with individuals. In these cases, penalties can be used to generate corrective action. However, education, training and technical assistance, understanding of alternative uses incentive structures, reduction in pressures to utilize environmentally fragile lands and participatory protection of natural resources are usually much more effective in internalizing environmental considerations into agricultural decision making.

1.3.3. Inadequate Resource Information

To understand environmental cause and effect relationships, and to evaluate their physical, economic, and social impacts, information on the environment must be available at a scale that permits appropriate decision making. For this information to be available, data must be collected, processed, analyzed and made accessible in usable form by the decision makers and users. Unfortunately, there is a serious lack of this basic information, particularly at the level of detail necessary for agricultural and resource utilization planning. In addition, even the available data are not conveniently available to those who could best benefit from them.

1.3.4. Institutional Constraints

The NAREPP Project Paper identifies four major institutional constraints relating generally to the management of environmental resources in Sri Lanka:

a) weak institutional capacities for natural resource management in the public and private sectors;
b) limited on-the-ground experience with alternative public-private partnerships in natural resources management;
c) insufficient numbers and quality of personnel, in and out of government, trained in basic skills of impact assessment;
d) limited opportunities for public review of government plans and decisions and for informed public participation.

In addition to these general institutional constraints, to which NAREPP is responding, primarily in relation to the needs of the government at the center and the formal private sector (with specific emphasis on the coastal zones and the urban-industrial sector), there are other institutional constraints of special relevance to the objectives of the SCOR Project:

a) inadequate institutional environment to foster new, sustainable production opportunities;
b) user groups nonexistent or too weak to participate in planning, management and control of natural resources;
c) resource tenure arrangements that inhibit adoption of sustainable production and conservation practices;
d) a lack of coordination among agencies, donors, projects, levels of government and resource users with respect to the use of natural resources;
e) a lack of supporting services for the identification and implementation of sustainable production and protection practices;
f) inadequate environmental consciousness with respect to potential impacts of agricultural and nonagricultural production decisions at various levels.

The SCOR Project will respond to these constraints, focusing on resource areas and governmental levels not addressed by NAREPP. In addition, it starts from the premises that

optimizing the sharing of resource management is fundamental, increased agricultural production and productivity are essential, and sustainability requires adequate consideration of environmental limitations as well as potentials. The SCOR Project purposes are directly aimed at reducing and/or removing these constraints.

In addition, as stated earlier, the Project will strengthen the capacity of the Provincial administration and the Divisional Secretariats in integrated planning of land and water resources utilization in the selected watersheds.

The number and variety of projects currently underway to improve the agricultural production sector, to rehabilitate and improve irrigation infrastructure, to enhance the capacity for appropriate planning and implementation of natural resource-based activities, and to increase awareness of environmental problems are such that the potential for overlap, duplication, and conflict, as well as for synergistic benefits exists. Effective communication and cooperation are necessary to gain benefits and avoid problems.

1.4 Relationship to GOSL/USAID Development Strategies

Recognizing the constraints described above, the GOSL has already undertaken a variety of actions to minimize these and continues to search for ways to eliminate them. A variety of projects are designed to increase agricultural production while also conserving the environment (see Annex IX, Other Donors' Activities).

In the irrigated settlements, the GOSL, with strong and continuing support from USAID, has fostered the participatory involvement of the water users in the management and control of water resources, through the formation of user groups and modifications in the structure and orientation of the Irrigation Department. This has resulted in more efficient use of the water, and greater production where it has been implemented. However, attempts to implement a similar approach in the minor irrigation sector have not been as successful, and much is still to be learned about the formation of sustainable natural resources user groups in non-settlement situations.

The production gains made possible through more effective involvement of the resource users in management and control will be short-lived if the fundamental natural environment in the watersheds that provide the critical water resource is not maintained. The USAID-supported NAREPP is addressing basic environmental policy and implementation issues, and is providing essential training in environmental impact assessment to personnel in the key environmental ministries, with special emphasis on those of the government at the center, and the private sector. The same level of skills may not be necessary in MADR and MLIMD, or in the Provincial Councils, but internalization of environmental considerations in their policies and actions, and in those of the clients they serve is essential for appropriate management of natural resources in production processes.

Though awareness of production opportunities, sensitivity to environment management needs, effective organizational structures, and cooperation and coordination with the government are essential, they are not sufficient to ensure an effective and efficient sustainable agriculture. Appropriate information, available in a timely way, is critical to effective management. Significant efforts are being made (see Annex IX - Other Donors' Activities) to increase the natural resources information base, and to maintain it in a form that is potentially widely accessible. There is a need, however, to clarify, to evaluate, and to make the necessary policy, organizational and/or operational changes which will ensure that necessary information is available to natural resources users and managers in both the public and private sectors.

Efforts are also being made to provide security of tenure in a variety of ways (see Annex V, Constraints Analysis). A major ADB-supported project designed to improve land use policy and planning is nearing completion. A Memorandum of Agreement on another ADB-supported project on participatory forest management was signed recently. But significant problems relating to the implementation of land tenure policies remain.

SCOR's interventions are directly supportive of GOSL/USAID's strategic objective of "sustainable productivity of natural resources" and the anticipated program outcome, "increased local participation and shared control of natural resources." It also contributes to two other mission objectives: the diversification and commercialization of agricultural systems, and citizen participation in democratic systems.

The activities of the Project are complementary and synergistic to the efforts of the USAID-supported Natural Resources and Environmental Policy Project (NAREPP), and are supportive of a number of other GOSL development efforts. The Project interventions are in consonance with the GOSL objectives for environmental protection and improvement, and are supportive of the GOSL policy of decentralization and devolution of authority and responsibility for many government functions relating to land and water use.

This Project is building on a base which USAID has laid with its previous Gal Oya Water Management Project (WMP) and Irrigation Systems Management Project (ISMP). This is the third in a series of projects dealing with land and water management in Sri Lanka, initiated shortly after USAID resumed its assistance program in 1977. Consequently, good working relations have been established with the Ministry of Lands, Irrigation and Mahaweli Development and also with the Irrigation Department and Irrigation Management Division. Other USAID projects have established linkages more broadly within GOSL. Special liaison has been established with the Forestry Department. The WMP and ISMP provided experience in creating and supporting user groups which will also be of value in this Project. There are user groups already existing which can utilize assistance under this Project to demonstrate approaches to sustainable productivity.

SCOR, a component of NAREPP, complements and extends into the agriculture sector the efforts NAREPP is making: to improve natural resources management generally at the national level through better appraisal, planning and implementation; to promote cooperation

between the public and private sectors for natural resources management, to develop impact assessment capabilities, and to encourage broader public participation on environmental issues. Particularly working with NGOs involved in environmental education, assisted under NAREPP, will contribute to progress under SCOR. The Participatory Forestry Project (PFP) supported by ADB has complementary goals, focusing on user resources management in upper catchment areas. SCOR will seek pilot areas that match PFP activities so both projects can reinforce and learn from each other.

CHAPTER 2 : PROJECT DESCRIPTION

2.1. Project Goal and Purpose

2.1.1. The Project's **goal** is to increase the sustainable productivity of the natural resources base in Sri Lanka in ways that will improve people's livelihoods beneficially and equitably now and in the future with due regard for the environment.[1]

2.1.2. The **purpose** of the Project is to increase shared control of natural resources through state-user partnerships that contribute to intensified and sustainable agricultural production while conserving the physical, biological and social environments.

2.2. Specific Objectives

The activities comprising this Project, to move toward its goal (2.1.1.) and to achieve its purpose (2.1.2.) are planned to be mutually reinforcing. The four specific objectives to be accomplished by this project are:

a) To improve in the **incentive and institutional context** in which agricultural and other commercial activities are undertaken, so as to ensure both productivity and sustainability;

b) To get resource user groups and managers to consider **environmental implications** of land and water use more explicitly and to internalize environmental considerations in decision making and implementation at all levels; and

c) To enhance governmental, group and individuals' **information and understanding** about potentials of and prospects for natural resources base for production and protection.

d) To strengthen the capacity of the Provincial/Divisional level government authorities in **planning for land and water resources utilization in an integrated manner,** gradually transforming the strategy of development of land and water resources from a "project" mode to a "program mode."

2.3. Project Approach

The project is designed to: a) increase users' share in the control of land and water resources, b) enhance users' capability through strengthening user groups, c) promote effective links between user groups, and state and private agencies (including NGOs) and, d) enhance the

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[1]References to "natural resources" or to "land and water resources" include forests and other biological resources where appropriate.

capability of the government agencies at different levels for planning, coordination and implementation of land and water management programs in an integrated manner.

In order to strengthen the user groups, they require economic opportunities, improved access to information, improved resource tenure, revision of legislation and regulations, etc. Hence, the Project will include these components in experimentation and subsequently in actual implementation. In addition to the experimentation with new strategies for better utilization of the land and water resources base, the Project will help augment the spread effects and institutionalization of tested innovations.

All activities are designed to strengthen shared productive control of natural resources through public-private partnerships. Since individual users cannot effectively deal with the public sector or the organized private sector, the Project will emphasize organizing and assisting resource users in effective groups and federations/councils.

The Project approach will be participatory in that the primary focus will be on resource users and on the agencies of the government with which they interact. Private sector and NGO actors will also be involved, drawing on their comparative advantages for promoting sustainable natural resources use in rural areas. Assistance will be provided to increase the technical and organizational ability of users to interact effectively with agencies and enterprises on matters relating to the use of production resources. Assistance will also be provided to agencies to improve their capacity to serve the users more adequately.

The Project which is planned for six years seeks to contribute to a progressive transformation of rural masses, expanding a range of new opportunities thereby relieving pressure on the natural resources base while using resources in sustainable ways for agricultural and other activities.

Where requirements for resolving identified problems of natural resources use are known, the Project will assist in meeting those requirements by providing incentives, training, and policy and process reform.

The Project will highlight the need for and assist in the gradual transformation of the working of the institutional system from a "project mode" to a program mode. It is hoped that by the end of this project, there would evolve a program whereby planning and coordination will be undertaken at the level of a watershed incorporating all available resources, governmental and donor. The capability and the capacity of the user groups and agency staff will be enhanced to undertake such a program.

In order to ensure a well-coordinated planning and implementation approach, the Project work will take place in four main phases within a given watershed. These are: planning and organization, experimentation and pilot-testing, consolidation and institutionalization, and augmenting spread effects. The details of activities and the implementation schedule in respect of these four phases are discussed in Chapter 4.

The Project will work concurrently at three different levels to create capacities for shared control of resources and more productive and sustainable natural resources utilization.

a. Some activities will be directed toward the **national level**, to improve policies and processes that deal with land and water resources use, and to support the implementation of programs at this level where an adequate knowledge base exists.

b. Other activities will take place at **provincial and divisional levels** in two selected provinces (NCP and SP) to strengthen institutional capabilities for supporting better land and water resources utilization. [2]

c. To develop practical, field-tested methods of organization, planning, monitoring and evaluation, the Project will work particularly **at watershed levels** in the two provinces. This is the focal point of project implementation.

As part of NAREPP, which focuses relatively more on the national level, SCOR activities will concentrate more on provincial, divisional and local levels. Also, while NAREPP deals mostly with non agricultural resources use, SCOR will bring agriculture sector activities under the "natural resources and environmental policy" umbrella of NAREPP.

2.4 Central Arenas of Project Activity - The Watersheds

As already mentioned above, the primary focus of project activity will be on the selected watersheds in the North Central Province and the Southern Province, which are the pilot area selected for Project operations. These Provinces, one in the dry zone and the other in the wet zone, are selected as these are illustrative of the range of physical and social environmental conditions found in Sri Lanka and also because of the strong interest shown by the Provincial and Divisional authorities in planning and implementing the project activities in their areas. During the Design Teams' discussions and consultations, the user groups and the relevant government officials have expressed their willingness and motivation to participate fully in SCOR activities. (See Annex VII - Institutional Analysis) The technical and economic feasibility and social soundness of basing project activities in the two pilot areas have also been established. (See Annexes III, IV and VI).

The Project will work in a number of watersheds in the two Provinces, covering an area of approximately 30,000 hectares. The first watershed in each Province has been identified. The rest will be identified as experience is gained through work on the first watersheds.

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[2]Corresponding Project activities will be undertaken at the district level if this level's role in local administration is retained. This design assumes that the Province and Division (AGA and Pradeshiya Sabha) levels will be the principal operative ones below the center.

In the NCP, the **Huruluwewa watershed** has been selected. (See description of watersheds in Annex XIII). The area, about 10,000 hectares in extent, is covered by two Divisional Government Agents' areas, viz. **Galenbindunuwewa** which covers the command area and part of the catchment, and **Palugaswewa** which includes the major part of the catchment. The area is represented by the poorest sections of the NCP community. The Provincial and Divisional authorities are already implementing or planning a number of activities in the Province which are in line with SCOR Project activities. These include construction of agro-wells to overcome acute shortages of water for crop production, particularly during yala; re-forestation to conserve catchments; promotion of ratan growing and developing ratan-based industries etc., **all based on a user-participation mode.**

In the Huruluwewa area, there is potential, and it is considered feasible, to implement SCOR Project activities directed at strengthening/initiating user groups around activities directed at conserving the critically endangered sections of the catchment. The people in the surrounding areas of the catchment are engaged in extensive chena cultivation for their livelihood. Almost the entire catchment area is covered by chena cultivation and large pockets of land are without any grown up trees. There are about 10 small tanks located in the different sections of the catchment but full cultivation is not possible, even in Maha due to the acute shortage of water. During the dry season, land is left fallow without any cultivation at all. However, there is high potential for utilizing ground water for crop production in this area. Already, at the tail-end of some of the D-channels in the Irrigation Schemes, agro-wells are being constructed to tap ground water and similar wells could be introduced to the lands surrounding the catchment area.

The SCOR project will help the people to utilize groundwater by means of agro-wells for profitable crop production during the dry season. This will lead to the release of catchment land which are presently used for chena cultivation. The catchment land located in the most critical hydrological areas within the catchment could be utilized for the cultivation of high-value timber.

In the irrigation command area of Huruluwewa, (about 5000 hectares in extent), the Farmers' Organizations are working actively with the cultivators in upstream areas to resolve acute water use problems. A feeder-canal diverts Mahaweli water to the severely water-short Huruluwewa irrigation scheme. It was reported that less than 40 cusecs of the 150 cusecs of water allocated reach the Huruluwewa reservoir owning to large-scale illegal tapping of water for paddy and even highland cultivation of about 2500 hectares upstream. The water use in this area is very high and wasteful and the illegal-tappers were unmindful of the plight of the legitimate users of the water in the Huruluwewa command.

The feeder canal has been cut across the catchment of several minor tanks and this may have deprived the present illegitimate users of the water rights they would have enjoyed before the canal was cut. However, their yields are high when compared to the Huruluwewa farmers, even though their water use efficiency is much lower.

As a result of the two sets of farmers getting together, a greater understanding of their problems have been achieved and ways and means of sharing of the water without affecting the interest of the majority are being worked out.

This situation, however, raises three typical issues that are proposed to be addressed by the SCOR Project, viz:

a) A rights issue (mainly of water, but also of land, in the unauthorized area).

b) A productivity issue (considering the yield foregone by the economy due to illegal tapping. This is the difference in water use efficiency between unauthorized tappers and Huruluwewa users).

c) Equity issue (as farm sizes of the illegal tappers in a few cases exceed 40 hectares).

SCOR will, therefore, assist and strengthen the current efforts of the government officials and the farmers' organizations to resolve these issues through the provision of technical assistance in the form of institutional organizers, action-research programs, etc.

In the Southern Province, the **uppermost watershed area of the Nilwala riverbasin**, about 10,000 hectares in extent and covering the Divisional Government Agent's area of **Kotapola**, has been selected. (See description of watershed in Annex XIII). This area includes two of Sri Lanka's important wet zone natural forest reserves, viz. Diyadawa and Panilkanda where a high degree of biodiversity could be observed. The two areas are also of critical importance, for hydrological reasons, in that the Nilwala River itself has its origin in the two reserves.

It will be technically feasible to try out in this area, the innovative ideas proposed by SCOR, especially the linking up of the beneficiary groups on the tea and other crop lands upstream with the downstream user groups and catalyzing a process of providing income-generating opportunities while protecting the environment. Administratively too, the consultation with government officials, other agencies, and user groups in these provinces has established the willingness and motivation of user groups and government officials to get involved in the proposed project activities.

During the Core Design Team's field trip, it was observed that in some parts of the watershed, the denuded forest lands have been turned into human settlements. There is a large number of blocks of such lands which are usually on a high elevation and surrounded by valleys. The terrain of the lands is such that water is not readily available for the settlers to engage themselves in profitable cultivation of traditional food crops. The Forest Department assists settlers in growing high value trees as part of a reforestation program in the area; but the benefits of this are long-term. The settlers, many of whom are youths are, therefore, compelled to neglect their land and look for employment elsewhere.

There are, however, prospects of improved utilization of these lands in a combined strategy of profitable agricultural production and environmental protection. It is observed that these areas, being in the wet zone receive reasonable rainfall during the year except for 2 or 3 months of a dry spell; but the groundwater potential in the area is high and this source could be tapped with minimum cost to tide over the water shortage during the dry season. Using this water combination of ground and surface water resources, the land could be put to profitable cultivation of high value cash crops in addition to the long-term perenials.

The Diyadawa and Panilkada forest reserves are earmarked for strict conservation purposes; but these areas are being degraded by tea and other crop cultivations and extraction of plant species such as rattan and bata (a species of bamboo). The rate of exploitation is so high that bata and rattan species have reached a stage of near extinction. To prevent these reserves from being overly exploited, a buffer zones covering these areas has been established; but the arrangements to manage the zones are found to be inadequate. Learning from the existing experiences of management of buffer zones of Sinharaja (which is an adjoining reserve), this Project envisages forming and strengthening the user groups for the twin purpose of protection of forestsand making use of the forest reserves for production activities such as kitul-based industries, medicinal plant extraction and rattan/reed extraction. (See Benefit area 2 of Annex IV - Economic Analysis).

SCOR will take up for experimentation innovative production modes around situations such as the above, to create and strengthen user groups to achieve greater profitability, productivity and sustainability of their land and water resources through shared control. The Project will catalyze a process of linking the support services including the banks in these efforts.

2.5. The Main Activity Components

The four main activity components selected for SCOR are:

a. Strengthening the capabilities of **resources user groups** to participate in planning, management and shared control.

b. Improving land and other **resources tenure arrangements** in ways that will further production and conservation goals for the country.

c. Strengthening **government, NGO, and private sector capacities** to support resources planning, management, and shared control at different levels.

d. Improving **coordination and linkage** among agencies, donors, levels of government, and resources uses and users, with respect to shared control.

Most of the above activities will be implemented in the watersheds (e.g., creation and strengthening of user groups, pilot experimentation, protection of watershed areas, etc.) while

others will be undertaken at the divisional, provincial and even at national levels. Examples for the latter are workshops and dialogues with the agency staff, mobilization of staffs, recruitment of catalysts, establishment of users' councils, policy, process and legislative reforms, etc. One very important feature of this Project is that it will start implementation from the watershed level and policy/legal reforms will be tackled at higher levels if, and only if, they are found to be obstacles for field-level activities.

Operationally, watersheds will be delimited in terms of some combination of (i) upper catchment areas, upstream of one or more command areas, created by control structures such as reservoirs or anicuts, and (ii) irrigation return flow areas downstream. It is expected that the Project will have under its implementation program, a few watersheds with a total area of about 30,000 hectares (ha) with the breakdown of 1,500 ha of catchment,[3] 5,000 ha of command and 3,500 ha highland area in respect of a single watershed. Two watersheds will be selected as pilot areas in the first year of project implementation. The pilot-testing will be expanded by adding a few more watersheds in the second and third years.

Having selected the first set of pilot watersheds one each from the two provinces through the study of maps, plans, reports, and photos and discussions with the officials and users and user groups, the Project will identify two sub-watersheds where the Project could concentrate upon its activities in the first phase of implementation. The sub-watersheds will be selected so as to include three main areas of forest, agriculturally used land and areas where misuse of land and water takes place. In addition, the inclusion of an irrigated area (in addition to rain-fed areas) as a component of the watershed will be considered in the selection of areas.

A constraint analysis will be conducted by project staff and users/user groups in close consultation with the agency staffs. The objective here would be to uncover the present pattern and status of land and water use and to assess the users' organizations, if any, in respect of their involvement in the use of land, water and forest resources in the selected areas. Once the analysis of constraints is completed, action will be taken to strengthen the existing users' organizations and together with them to develop a land and water use plan for the area. In areas where user groups do not exist, a pragmatic approach will be followed to ensure user participation in the analysis of constraints. In such areas, the creation of user groups will be considered as the first important activity by this project. This process will be initiated in the first year. It is hoped that by then, there will be an indicative land and water use plan prepared by the existing agencies (such as the LUPPD) in which case the plan will be used in consultation with the users. The user groups will be facilitated for the implementation of this plan as a means for shared control. To facilitate the strengthening of user groups, they will be linked to

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[3] The catchment of a watershed could be much larger than 1,500 ha. However, for the purpose of creating effective user groups which would be able to demonstrate the possibility and viability of "production and protection," an area of 1,500 ha will be selected. In certain watersheds the "highland" area may be less than 3,500 ha. In such cases catchment area included in the pilot may be expanded.

a process of developing economic/commercial activities, to markets, banks and the private sector delivering the necessary services, and will be provided with improved access to information on a regular basis.

Learning from the past several years of experience gathered through working with user groups and organizations, particularly in the irrigation sector, the user group creation and strengthening will be done in respect of the three components of the watershed on the following basis: In the catchment area of 1,500 ha, it is expected that user groups will be established at the rate of about 45 members per group. This works out to 35 user groups in one catchment. In the irrigation command area of about 5,000 ha, it is assumed that each group will consist of about 25 members and the number of user groups will be about 200. There will be 100 user groups in the highland area where each group will consist of about 35 individual users.

These user groups will form users' organizations and councils as indicated below:

	Per watershed (10000 ha)	**Total Project**
User groups	335	1,000
Users' organizations	35	100
Users' sub councils	05	15
Watershed council of users	01	3

It should be noted, however, that more accurate numbers of groups or the membership per group or organization cannot be decided at this stage as this would depend on specific conditions prevailing in the area selected, type of economic/commercial activity, etc. User groups in the watershed area will be federated to higher-level formal organizations on the basis of spatial distribution, as well as of specific activities such as the production of fruits and vegetables under supplementary irrigation, non-wood-forest-based activities, mushroom cultivation, and tapping the kitul palm for producing treacle and vinegar. It is expected that each activity will center on the theme of "production and protection." How the users' sub-councils will be formed at higher levels is not clear at this stage. It can be expected that there shall be one such council covering all the user groups involved in irrigation and another one encompassing all user groups in the catchment area and so on. Both the activity and spatial considerations may be useful in this grouping. Working on this basis, it may be expected that the Project will facilitate the establishment of about 5 users' sub-councils in each selected watershed. Finally, the sub-councils may be encouraged to federate to the watershed level where there will be one council of users.

It is expected that by the time the initial organizational work is completed, an implementable **land and water use plan** for the pilot areas would have been evolved and implemented to achieve increased shared control. Subsequent Project activities will concentrate on facilitating the user groups/users' organizations in the implementation of this plan. Planning

and implementing mechanisms both for institutionalization of the process and for spread effects to non-project areas, will also be undertaken.

A special focus of the Project is to initiate some immediate economic activities building upon **local capabilities** created by previous land and water resources management projects (e.g., INMAS, ISMP). This will not only permit the project to achieve more benefits during the life of the project, but also help speed up the approach and methods to achieve the Project goal of **sustainability** in participatory resources management.

Another focus of Project activity will be on further expansion/replication of already proven innovations within the pilot areas. The Project will also undertake some **action research** to test various strategies such as the impact of tenurial forms on productivity and sustainable use of land and water resources. The project will plan and carry out specific strategies to accelerate the processes of institutionalization and spread effects for continuing new innovations introduced by the project. To facilitate this, the project will plan to involve selected user groups, government, NGO and private-sector personnel from outside pilot areas through special mechanisms and procedures following participatory approaches.

2.6. Project Activities

The planning and implementation of most of the Project activities will be concentrated on the watersheds. The participatory nature of all Project activities will be emphasized. After mobilizing the Project staff and the agency officials for Project implementation, the project will undertake a **constraints analysis** to assess the status of resources use, users and the existing organizations, knowledge and institutional factors that prevent resources users from utilizing land, water and other resources (labor, capital, forest, etc.) to the best advantage. Participatory rural appraisal will be used and refined to develop methodologies for application in other areas.

The details of Project activities are described below under the four main Project activity components:

2.6.1. **Strengthening the Capabilities of Resources User Groups.** In pilot areas, the Project will work with existing user groups to strengthen their ability to plan for and manage the optimal use of land and water resources. At the provincial and national levels it will undertake such activities as will create an enabling environment for user groups to become more effective and productive in their shared control of resources.

a) The Project will first identify and assess **existing local organizations** in pilot areas to determine their willingness and suitability to work toward the Project's goal and contribute to various Project activities. This will be done concurrently and in conjunction with (1b). Different kinds of resources uses and users will be involved given the focus on managing soil and water resources within watershed units. It was observed during the field visits that several types of user groups have already started to function. There is, however, a necessity to strengthen

units. It was observed during the field visits that several types of user groups

them and to coordinate efforts while providing guidance for them to get involved in business activities in particular.

b) The Project will support identification and implementation of appropriate **legal status and powers** for resources user groups to give them sufficient recognition and authority for expanded responsibilities in economic production activities and natural resources management. It was observed during the study tour of NCP and SP that there should be a more expeditious way to get the FOs registered and that they should have authority to resolve water disputes (Reports of Field Trips of NCP and SP 1992). This activity is consistent with government policy and assumes continuing political support of participatory management of land and water resources.

c) Where users are not organized in pilot areas, particularly in catchment areas, the Project will support **user group creation**, possibly through its own catalysts or through selected NGOs. Developing viable user groups in rain-fed and catchment areas will present a special challenge, given their more dispersed and independent economic activities. Experience with irrigation user groups can give some guidance and examples, but information on incentives and means for organizing rain-fed farmers and other resources users in upland areas is lacking. For instance, the Core Project Design Team in its tour of the SP has observed how forest users as groups have been organized for exploitation of forest products such as reed and rattan for local industries while replanting at the rate of 100 plants for each plant uprooted (ibid. p. 19).

Experience with production and protection through organized action are also reported in other countries. For instance, in the Central Visayas Region in the Philippines, groups of upland residents were organized into associations which established nurseries for reforestation and they were given exclusive rights of harvest within a stipulated period. This is a new model which requires further study. In the State of Haryana in India, village resources management societies were created to protect the upper catchment where state forest lands are located. These societies have purchased lease rights to harvest grass from the catchment. Grass is sold for rope making or as fodder for dairy cattle and villagers have a strong incentive to protect the catchment for grass production. From these efforts irrigation schemes below the catchment have benefited. These structures serve as a strong incentive for protection of the catchment by all villagers including those without irrigation (Banerjee 1990).

Innovative efforts at user group organizing supported previously by USAID, offer some useful precedents. Similar efforts are needed under this Project. The interventions will be supported by experience with user groups outside the irrigation sector as well as evaluation of experience in the irrigation sector. To create and/or strengthen user groups, the Project will support and further

experiment with the training and deployment of **catalysts** such as Institutional Organizers used in previous projects and will also use other methods to work effectively in non-irrigated settings. As observed in the SP field tour for instance, the creation of immediate income opportunities such as the introduction of **new methods of irrigation, supplementary irrigation during dry spells in the wet zone, conjunctive use of surface water and groundwater for irrigation, tapping the kitul (Caryota.spp.) palm** and processing its products, etc., will work as sufficient incentives for them to form groups (Reports of Field Trips of NCP and SP).

d) The Project will support **training** of user groups and of trainers who can take leadership roles in this process in pilot and other areas. The aim will be to strengthen different kinds of user groups in skills such as financial management, developing training materials and methodologies that can be used more broadly and the extraction of economic products from forests and their processing. As much as possible, existing capabilities for training will be engaged. The assistance of NGOs in developing and providing training will be sought.

e) The Project will support experiments with establishing **economic opportunities** for user groups in agriculture, forestry, and other economic sectors that increase incomes compatibly with maintaining natural resources. These activities should strengthen user group capabilities as well as improve people's incomes and well-being, because such capabilities also contribute to these socioeconomic outcomes. This activity will reinforce Project efforts under (1c). Experiments where user groups have been provided with economic opportunities have been reported both here and elsewhere. For instance, it was observed in the tour of NCP and SP that a large number of non-wood-forest-resources could be extracted from the forest areas. Among them are the medicinal plants, bees' honey, reeds, rattan, edible wild fruits, kitul tapping, etc., which can provide income and food for the people thus directly contributing to a better livelihood (Reports of Field Trips of NCP and SP).

In Honduras where hundreds of farmers in small villages on the northern coast are using velvet bean in association with maize, results are good in terms of higher yields, erosion control, reduction in weeding, and land preparation costs. The farmers obtain maize yields of 2,700-3,250 kg per ha. (more than double the national average) without using chemical fertilizers. On the Island of St. Vincent, in the West Indies, vetver grass has been stopping erosion on slopes of upto 100 percent for over 50 years and, in some areas, has resulted in the build-up of natural terraces to a height of 4 meters (Reijntnes et.al. 1992).

f) Special efforts will be made to increase opportunities for **women and youth** to raise household income and diversify rural economies since decisions about

natural resources use involve more than household heads. Increases in women's incomes after forming themselves into organizations have been reported in West Bengal, where women's organizations were given legal rights to extract non-timber products from rehabilitated forests (Bromley, 1989). Women earned substantial income from these products which acted as an incentive for them to contribute toward stewardship of the forest. Research will be undertaken on effects for families and households of expanded economic opportunities.

g) The Project will support development of and access to **Supporting Services and Facilities** that strengthen user group's financial base and contribute to the local economy in sustainable ways such as, linking users to markets, establishing revolving funds to help groups to borrow, providing matching grants in the form of a Fixed Deposit Scheme in favor of user groups to enable them to raise a loan from a lending institution against this deposit, discussing with state and private insurance firms and drawing up innovative insurance schemes for new crops and investments backed by a guarantee by the Project, providing funds for registration or the preparation of legal documents for the establishment of production companies, negotiations with state and private agencies to get storage facilities for user groups, discussing with the private sector and securing such facilities like land, stores, etc., to enable them to set up supporting services in selected watersheds, providing seedlings, etc., (e.g., for economic and agro-forestry), and providing information, education and communication materials. Experience suggests that the provision of support services is very important to strengthen user groups. For instance, several social forestry projects in India have placed increasing attention on growing non-timber products, but have not explored the best channels for marketing and processing them in order to generate maximum income for local people. Such efforts, therefore, have not produced best results (Grimshaw, R.G. 1989). Experiments will be undertaken to determine the best modalities for strengthening support services and facilities, including work with NGOs and private sector enterprises.

h) 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 organization that can achieve economies of scale and greater value-added from production, e.g., through processing to enhance household incomes and reduce demands placed on vulnerable natural resources.

2.6.2. **Improving Land and Other Resources Tenure Arrangements.** For promoting agricultural and other kinds of natural-resources-based production that are sustainable, intensive and profitable within rural areas, more attention needs to be paid to (i) people's access to land and water resources, (ii) the terms on which that access occurs, and (iii) the resulting incentives, whether resources will be used in the most sustainable and beneficial ways. Security of tenure and equitable sharing of benefits are generally regarded as essential to achieve the latter results. Project activities will include:

a) Examination and evaluation of current **regulatory and legal mechanisms** concerning land and other natural resources. The Project will ascertain the need for changes in existing legislation, to consolidate, modify and implement it as found appropriate. This is important since there are 15 different Acts on Water Resources which are in operation at present (Upadhyay S.N. 1992).

b) Applied research on existing **resources tenure arrangements** for land, water, and trees as they affect production practices, cropping patterns, investment incentives, time horizons, etc., in catchment, command and drainage areas. Examples include different titling statutes, sharecropping arrangements, rotational land use (thattumaru), absentee landownership, and other practices. In the NCP, especially in settlement schemes it was observed that absentee landownership has an adverse impact on both productivity of the use of the land and water, and on equity (Reports of Field Trips of NCP and SP 1992). Experience in other countries would be assessed as relevant to Sri Lankan tenure issues. The 1957 nationalization of Nepal's village forests by the government converted a common property regime at the village level into a state property regime. Due to villagers' perception that "their" forests had been expropriated by the government, the resource became an open access which villagers felt free to squander. Another case is reported from Thailand where more farmers (69%) felt that land tenure made no difference to farming practices and did not limit the establishment of permanent tree crops. In fact, some farmers asserted that planing fruit trees was a way for them to make a more secure claim to the land they were farming (Bromley, D.B. and Cernea, M. 1989). In addition to these, Huruluwewa feeder channel case may be quoted as a classic case of conflicting resource tenure arrangements which has resulted in sub-optimal utilization of scarce resources. The SCOR Project will catalyze participatory processes to overcome such problems of user rights.

c) The Project will undertake policy dialogue at the national level and work with the relevant ministries and departments to initiate **policy and process reform** for incentives and institutions that will support more beneficial and sustainable natural resources use in rural areas. This effort will draw on the results of Project studies and experience as well as on policy analyses conducted by IMPSA and other field experience in the country.

d) Support for **land titling** in both settlement schemes and on state lands will be monitored and evaluated for the implications of this for productivity and sustainability of natural resource use. It was observed in Thailand (Feder, G. 1989) that titled land had a significant impact on productivity mainly because of their value for obtaining loans with land as collateral. Under the same project, it was observed that since farmers had been resident in the area for sometime, security to the land did not seem to affect the decisions to invest on the land. In the NCP, it was observed that clarifying uncertainties and issuance of land title occupy a significant amount of official time and may be a source of corruption. Hence, this issue will be examined by the Project.

e) Experimentation with **land consolidation** to increase productivity and sustainability and reduce pressures on the land. The DAS has undertaken a program of land consolidation in the Ulankulama village tanks scheme in the NCP. The command area of this tank had about 130 small and scattered land parcels belonging to some 200 farmers. Some of these parcels were not even cultivated since it was found uneconomical to do so. The DAS's program concentrated on surveying the parcels belonging to each farmer and re-arranging the parcels in such a way that each person had his/her area in one contiguous plot. This program of land consolidation not only made it economical for cultivation since the land size was increased, but also resulted in increasing farmer profits through economies of scale. The World Bank-assisted projects in Morocco and India suggest that land consolidation programs should accompany adequate technical packages or support services if they are to produce the desired benefits (Bromley, D.W. and Cernea, M. 1989). The Project will consider both programs, viz. (i) consolidation of fragmented private holdings, and (ii) pooling of resources to gain better access to credit, production inputs and economies of scale, to assess implications of alternative methods.

2.6.3. **Strengthening Government, NGO and Private-Sector Capacities**. The following activities aim to increase participatory management. The Project will pool expertise in ways that reduce duplication of efforts and improve the possibilities of coordinated action within and across different levels, providing for participatory inputs.

a) The Project will work with several ministries and agencies, as well as with donor projects, to establish **information systems**, including Geographic Information System (GIS), that will support national and lower-level capabilities not only for **monitoring and evaluation** of trends and performance in rural areas with regard to intensified agricultural production and natural resources maintenance, but also for production and protection of the land, water and forestry resources. Such systems will be designed to be useful for provincial and divisional-level decision makers as well as for local communities and resources users.

b) The Project will work with **national-level departments and agencies** to raise the level of staff interest and qualifications for dealing with agricultural intensification and natural resources management in participatory ways through training, information dissemination and other means. Some long-term training is planned under this activity.

c) The Project will work with **provincial councils and their staffs** in the two selected provinces to help develop planning, monitoring and evaluation capabilities to support divisional and local-level operations for intensified sustainable agriculture and diversified economic activities with due regard for the natural resources base. Some commodity support is planned for this.

d) The Project will work with **divisional offices and line agency staffs** in the selected pilot divisions in the two provinces to develop appropriate planning, monitoring and evaluation capabilities to support Project objectives and activities. Once effective materials and methodologies are developed with the pilot divisions, the Project will extend them to other DGA divisions within the two provinces. Some commodity support will be given for this.

e) The Project will work with selected **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 monitoring and evaluation with user groups and communities to raise environmental consciousness, and to integrate such considerations into production planning and implementation. For instance, it was observed in Muruthawela in the SP that development of marketing links alone can increase the income of users manifold. With diversified cropping in rice-based systems in Sri Lanka, it is reported that farmer income has been increased by about three times (Report of Field Trip of NCP and SP 1992) NGO capacities to promote shared control and participatory management will be developed.

f) The Project will also work with the **private sector and banking** institutions to enhance their capacities to support these kinds of economic and institutional transformations. One aim will be to get adequate and efficient private support services operating in pilot areas, e.g., for processing agricultural commodities, or for surveying in support of land titling programs.

2.6.4. **Improving Coordination and Linkage for Resources Management.** In the pilot watersheds, the SCOR Project will take the leadership in bringing the activities (projects, programs etc.,) based on land and water resources into closer coordination. The Project will strengthen the capacity of the Provincial administration and the Divisional Secretariats in integrated planning for the utilization of land and water resources in the watersheds. The institutionalization of such an approach will shift the strategy of development of land and

water resources from an uncoordinated "project mode" to a well coordinated "program mode". For better utilization and protection of natural resources, it is important to have better horizontal and vertical integration. An innovative aspect of the Project is to focus on **watersheds** as units for integrated planning for land and water resources utilization. Coordination efforts at the watershed level have both participatory (2.6.4a and 2.6.4b) and administrative (2.6.4c) aspects:

a) The Project will work with user groups in selected areas within watersheds, such as irrigated command areas, to introduce **multi-level planning** so that land and water resources uses are more coordinated for intensive and efficient production taking a long-term perspective. This will be done in cooperation with government and private agencies providing services and advice.

These efforts will be monitored and evaluated. Plans will provide for crop diversification or specialization depending on the circumstances, coordination of seasonal schedules, economizing on irrigation water, enhancing crop protection (introducing integrated pest management), and making marketing more efficient and profitable, all with a view to ensuring food security as well as raising incomes.

b) Building on efforts to strengthen user groups, the Project will support **federations/councils of user groups** which use resources in different parts of the watershed and whose uses have impacts on one another. Such organizations can help improve coordination and cooperation not only among users but also between government agencies and user groups. In SP for instance (Reports of Field Trips of NCP and SP), the irrigation-related users' organizations expressed the need to form a users' organization centered on various components of the watershed such as above reservoir, command, drainage, etc., and to link all of them to a council of users.

Councils will be helped to undertake **participatory land use planning** at watershed level, including soil and forest conservation, working with the administrative mechanisms established referred to in 2.6.4c. Federations will facilitate administrative and technical personnel sharing in local knowledge about sustainable resources use under local conditions.

c) Watersheds are currently overseen or managed by different government agencies and they often cross administrative boundaries. This makes coherent planning, monitoring and evaluation difficult. The Project will seek ways to achieve more rational, long-term resources management through **administrative mechanisms** that achieve interdepartmental and inter-jurisdictional coordination, complementing efforts under 2.6.4b. Severe destruction has been caused to watersheds already. In Muruthawela Scheme, for instance (ibid. p. 25), 3/4th of the catchment area has already been opened up for development, especially tea

and cinnamon cultivation. In addition, forest destruction now taking place in watershed areas in the SP, alleged to be supported by powerful individuals, is substantial. The Design Team observed in its tour of the NCP that frequent undesirable influences are an impediment to more productive and equitable use of the resources (ibid. p. 25). Users have no means to control such damages. They see strengthening of organizations and federating them at higher levels and linking them with relevant agencies, as the main strategy to control these influences.

The **Watershed Resources Management Teams** (WRMTs) proposed for Project implementation will be the main mechanism for this, as they are interdepartmental and, where the selected watershed crosses administrative boundaries, interdivisional.

d) Another focus of Project activity will be to strengthen connections between **provincial and divisional planning and implementation**. The powers and capabilities of both these governmental levels are still being determined and defined with respect to natural resources planning and management. The Project will facilitate productive working relations between these two levels in the selected provinces, to serve as models for evolving productive relations elsewhere. The structures and procedures worked out should include user participation or consultation as part of the coordination/linkage effort.

Appropriate linkages will be explored with **local government** bodies, such as the Pradeshiya Sabha, for land and water resources use or planning.

e) Responsibility for land and water resources management is diffused within the Government of Sri Lanka. The Project will facilitate better communication and cooperation among **government agencies and donors** with regard to long-term, sustainable and productive use of these resources.

f) Coordination among **projects** affecting land and water resources use is a specific aspect of this. Modalities for this will be developed inductively, as they are likely to be better grounded and more acceptable if they flow out of experience and experimentation in the two provinces with pilot activities.

g) The Project, in participation with WRMTs, Agencies, NGOs, and UGs will support establish information systems to facilitate information flow both from the field level upwards and from the government/provincial quarters down to the watershed level. The objectives of the information systems are manifold. First, information on new and sustainable technologies should flow down from the research centers and other NGOs, etc., to the user groups operating at the watershed level. Such technology is viable for both production and protection. Second, opportunities available for users such as banking and credit facilities,

market and processing information, etc., should be made available to the user organization. The Project will facilitate linking users' organizations with the above mentioned agencies. Third, the flow of information on policy, legal and regulatory aspects and information on government/agency programs to the users' organizations should be facilitated by the project. Finally, information on progress and other significant achievements of the Project should be brought to the knowledge of provincial and national-level agency staff. The Project will develop appropriate mechanisms through a participatory mode to facilitate the upward flow of this information.

In conjunction with other components of NAREPP, this Project will work with NGOs and others in the pilot areas to develop and apply **education and awareness strategies** to reduce adverse uses of natural resources while promoting sustainable agricultural and rural development. A summary overview of Project activities, listed by activity area (output category) is given in **Table 1**.

TABLE 1. Listing of project activities.

1. **Strengthening the Capabilities of Resources User Groups**

   a) Survey of Existing Local Organizations (in pilot areas)
   b) Constraints Analysis (in pilot areas)
   c) Legal Status and Powers for User Groups
   d) User Group Creation (in pilot areas)
   e) Training for User Groups and Trainers
   f) Economic Opportunities for User Groups
   g) Special Opportunities for Women and Youth
   h) Supporting Services and Facilities for User Groups
   i) Production Companies

2. **Improving Land and Other Resources Tenure Arrangements**

   a) Regulatory and Legal Mechanisms
   b) Resources Access and Tenurial Arrangements
   c) Policy and Process Reform
   d) Land Titling
   e) Land Consolidation

3. **Strengthening Government, NGO and Private Sector Capacities**

   a) Information Systems
   b) National Departments and Agencies
   c) Provincial Councils and Staffs
   d) Divisional Offices and Line Agency Staffs
   e) Strengthening of NGOs
   f) Strengthening of the Private Sector and Banks

4. **Improving Coordination and Linkage for Land and Water Resource Management**

   a) Coordination among Projects, Programs and Activities
   b) Provincial and Divisional Planning and Implementation
   c) Government Agencies and Donors
   d) Administrative Mechanisms for Watersheds (in pilot areas)
   e) Multi-Level Planning (in pilot areas)
   f) User Group Federations in Watersheds (in pilot areas)
   g) Establishment of Information Systems

2.7. End of Project Status: Project Outputs

At the end of the project period the SCOR Project, through the institutionalization of participatory processes in land and water management, will improve the quality of both the environment and the livelihood of the people with equity. It will bring in better environmental management and increase in agricultural and other production.

More specifically, the Project will achieve the following:

a) Improved access to resources (the catchment, highlands and irrigated command) will be effectively utilized for greater benefit to the people in a sustainable manner through well-designed participatory land use planning processes.

b) Better information systems which will facilitate the flow of two-way information between user groups and supporting "actors" including the government, NGOs and the private sector. This will help user groups to enhance their production, potential and management capacities. The government will be better-informed about field-level activities, especially with regard to land, water and forest resources management and the private sector will be better-informed about new production and marketing opportunities.

c) Better marketing opportunities for the people through linking of markets to organized production groups and companies.

d) New production systems introduced in keeping with effective and sustainable land and water use.

e) The government agencies strengthened through better planning, coordination, and joint implementation.

f) The increased capabilities of NGOs and the private sector through better training and greater incentives. They will get greater opportunity to work with users' organizations.

g) The provision for improved tenure will enhance the capabilities of farmers to work with user groups and develop their production activities.

h) The project will have developed a mechanism for participatory planning, coordination, monitoring and implementation of development in respect of watershed as a basic unit with Watershed Management Teams, Provincial Working Groups in several provinces and a National Working Group at the center.

i) The Project, based on experimentation, will have influenced favorable changes in the policy and process related to land and water use.

The spread effects of the Project will reflect in many other watershed areas, and will help give a new dimension to the traditional approach to the development of natural resources. The principle of shared control will help change the thinking and attitudes as well as patterns of cooperation between the government and the people through user groups, at all levels, and new leadership patterns will develop among the people.

The spread mechanism introduced by the project will facilitate catalyzing the adoption of this model in several watersheds in outside areas.

The Project outputs in the four activity areas are described below:

2.7.1. **Strengthened capabilities of resources user groups, resulting from:**

a) Provision of legal status to about 100 users' organizations for different types of activities (irrigated agriculture, rain-fed agriculture, forest activities), in the 4-6 watersheds selected covering about 30,000 ha. Additional provision of support for legalizing a larger number of users' organizations in non-project areas through the spread mechanisms designed by the Project.

b) The strengthening/creation of about 1,000 informal user groups,[4] 100 users' organizations, 15 sub-user councils and 4-6 watershed councils covering catchment, command and downstream areas. In this manner, over 20,000 households (about 100,000 people) will directly benefit from the new production opportunities evolved by the project. In addition, a large number of "supporting actors" will also benefit from project activities.

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[4]In 30,000 ha covering about 4-6 watersheds, the number of potential Informal User Groups that could be developed is calculated on the following basis:

a. Command area of 15,000 ha could be equivalent to 600 groups each consisting of about 25 users, and each user having about 1 ha.

b. Catchment of 4,500 ha could be equivalent to 100 groups, each having responsibility for about 45 ha.

c. Highland area of about 10,500 ha could be equivalent to about 300 informal user groups each member having 1 ha and a group consisting of about 35 users.

c) There will be at least 3,000 representatives of informal user groups[5] with training in organization, management, production planning, entrepreneurial and environmental protection skills. About 40 selected users' organization representatives will be sent on study tour abroad. Additional provision of training a larger number of users in a variety of activities will be undertaken by the trainers who will be trained by the Project.

d) New production opportunities for rural households, with special attention to women and youth, so that their incomes are improved in a sustainable way, without damaging the natural resources base upon which rural communities depend.

A minimum of 30 production models[6] in about 4 watersheds will be established by the Project.

e) Ten Production Companies representing 3 models viz: (i) based on pooling of land resources, (ii) based on pooling of other resources, and (iii) nucleus farms, for intensifying production in watershed areas in sustainable and environmentally sound ways will be established on an experimental basis to provide for broader participation by resources users.

f) Multiple support systems for resources users (agricultural and nonagricultural providing technical advice, access to credit and to other production inputs, and profitable marketing opportunities as well as acquisition or creation of assets that increase income streams in sustainable and environmentally friendly ways. About 300 rural-based commercial activities and 10 production companies will be linked to new markets. The Project will also establish revolving funds, provide matching grants, etc., to assist the above commercial activities.

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[5]It is assumed that at least 7 members from each user group will be trained by the Project.

[6] Some possible production models could be based on cash crop cultivation utilizing supplementary irrigation: treacle and vinegar making, dairy-based activities including goat-rearing, non-wood forest kitul tapping, bee-keeping, fruit processing, based activities, planting/after care of medicinal plants (after extraction), rattan, reeds and bamboo, and marketing.

2.7.2. **Improved land and other resource tenure arrangements, resulting from:**

a) Modifications in **regulatory and legal mechanisms** that will encourage resources users to protect and maintain land, water, forest and other biological resources beneficially.

The Project will formulate and help implement a system of sanctions through organized user groups to protect about 5,000 ha of upper catchment, storage systems, and corresponding command and drainage areas. It should be noted that the impact of such mechanisms will be felt over a wider area.

b) Policy and process reforms that give support to shared control of natural resources for their long-term management. The Project will support and assist in the development and formulation of a new law for watershed development. The Project will also support and assist in the formulation of a Water Resources Law/Irrigation Law following the recommendations of IMPSA.

c) Accelerated issuance of **land titles** so that eligible households have secure control over land and water with greater incentive to use these resources sustainably. The Project will formulate innovative participatory processes to expedite issuance of a minimum of 15,000 titles to land parcels in the 2 pilot areas. The implementation of these processes will help replication of the processes in other areas too.

d) Procedures and incentives for land consolidation that enable farmers to use this resource more efficiently for long-term productivity gains.

Utilizing a process similar to the Ulankulama model (initiated and implemented by the Commissioner of Agrarian Services) a land consolidation project will be undertaken in a minimum of 20 village tank areas. Moreover, consolidation of lands in respect of 25 tanks will be achieved through the Project's spread effects.

2.7.3. **Strengthened government, NGO and private sector capacities, resulting from:**

a) Integrated and accessible **information systems** for monitoring and evaluating land, water and forest and other biological resources, providing users and decision makers at national, provincial, divisional and local levels with what they need to know to assess trends and performance in terms of resources sustainability as well as productivity. Using appropriate technology, the Project will establish information systems in the Project areas. These systems will cover 100 users' organizations, 15 user councils, 4-6 watershed councils and 8 divisional secretariats in the pilot areas.

b) Increased number of **national-level staff** with experience and training in monitoring and evaluating land and water resources uses and maintenance. This will reinforce NAREPP's output of increasing the number of government agencies with trained personnel effectively operating environmental units.

The Project will provide long-term training at M.Sc. level for 2 national level officials, locally/abroad, and opportunities for study tours abroad for 5 officials.

c) Increased number of **provincial-level personnel** with experience and training in land and water resources planning, monitoring and evaluating at that level and below. The Project will provide short-term training for 4 officials, study tours abroad for 6 officials and skills development and awareness training through in-country workshops and seminars for a minimum of 50 officials.

d) Increased number of **divisional and agency staff** with experience and training in participatory natural resources management. The Project will provide short-term training abroad (3 months' duration) for 6 officials, study tours for 15 officials and skills development and awareness training for 150 officials at divisional/field levels.

e) Increased number of **NGO** personnel with experience and training in participatory natural resources management, and increased number of **NGOs** that have experience and financial capability to work with resources users in training and group formation modes and with GOSL and private sector entities to improve land and water resources use. A minimum of 20 NGOs in the 2 provinces will be supported and strengthened through local training.

f) Increased number of **private sector and bank staff** will be trained in assisting user groups to formulate and implement projects with the participation of NGOs.

2.7.4 **Better coordination and linkage among users and agencies, resulting from:**

a) **Methodologies** for multi-level planning which enable resources users to cooperate among themselves and with government and private agencies (particularly for credit, technical information, and sales). This will support crop diversification, protection (integrated pest management), and marketing, to increase household incomes. These methodologies will be implemented in the Pilot Project areas.

b) **User group federations/councils** in pilot watersheds to achieve participatory **land and water** use planning within these areas. Linkages will be established with a minimum of 100 user organizations, 15 user councils and 4-6 watershed councils.

c) **Administrative mechanisms** at the divisional and interdivisional levels which coordinate among line agency personnel to achieve more integrated use and maintenance of land and water resources within designated watersheds.

d) **Mechanisms** in selected Provincial Councils and Divisional Secretariats for carrying out land and water resources planning and monitoring.

e) **Mechanisms** at the national level for GOSL ministries and departments dealing with land and water resources management to coordinate among themselves and with donor agencies funding projects to improve natural resources management.

2.8. Project Inputs

2.8.1. **Technical Assistance**: SCOR will require technical assistance (sponsored by USAID) of a wide range of interdisciplinary skills from Sri Lankan and expatriate consultants to address the needs of different public sector agencies, user groups and private sector organizations. Long-term TA will cover institutional development, agro-forestry, irrigation, enterprise development, strengthening participatory management policy analysis and other needs mainly at the watershed level, as listed in **Table 2**. Support will be provided to the MLIMD and other national agencies and to Provincial Councils through the National and Provincial Project Working Groups as well as to divisional agencies through Watershed Resources Management Teams operating under PWG supervision.

Short-term TA to complement the expertise of the NWG and PWGs is listed also in **Table 2**. The areas of expertise may be adjusted to meet implementation needs during the course of the Project. The Table 2 also lays out the prospective TORs for short-term and long-term consultants.

The Project will enter into contract with NGO's, private sector, universities, Agrarian Research & Training Institute, Rural Development Research and Training Institute to perform a limited number of services which they are best equipped. The TORs for such contracts are outlined in **Table 3.**

2.8.2. **Training**: Short-term training will be provided for approximately 3,000 resource users and their representatives, an estimated 30 group organizers, 20 trainers from NGOs and/or public institutions, 50 divisional personnel, 30 provincial personnel, and 40 national personnel (public and private sector). Long-term training at the master's level is planned for two professionals in land tenure and resources evaluation, and data-base management.

2.8.3. **Commodity, Facility Support**: Minimum material inputs are planned in support of this Project, mostly vehicles for facilitating movement within the pilot areas and computer hardware and software for establishing natural resources information systems at different levels of decision-making.

2.8.4. **Special Projects:** Providing support to user groups to engage in productive activities by setting up revolving funds and acquiring storage facilities should be possible through loan guarantees to be worked out with the banking system or through credit guarantees to private suppliers. Alternatively, the Project will make funds available to the banking system for loans that create revolving funds and storage facilities. User groups will be expected to make substantial contributions to such assets through their own funds and/or labor. The Project will not make gifts to user groups as this would not establish good precedents for self-reliant management practices.

2.8.5. **GOSL Inputs:** GOSL's major contribution to the SCOR Project will be operational support for programs at the provincial, divisional and watershed levels. In addition, GOSL will provide training facilities for staff, resources users training, and data for establishing information systems on natural resources.

2.9. Project Organization

As an institutional development and strengthening project, the SCOR Project organization structure will emphasize its catalytical and facilitating role. It will provide for a high degree of involvement of members of the GOSL at all levels, nongovernmental actors, and particularly resources users, who are its main beneficiaries.

The Ministry of Lands, Irrigation and Mahaweli Development (MLIMD), with its major responsibilities for land, water and forest resources, will be the institutional home for SCOR. It will establish a **governing body** for the Project, called the National Steering Committee on Land and Water Resources Management (NSC). The NSC will include senior representatives of the relevant government agencies, of the MLIMD, Ministry of Agricultural Development and Research, Ministry of Environment and Parliamentary Affairs, Ministry of Policy Planning and Implementation, the North Central and the Southern Provincial Councils, representatives of the nongovernmental sector, and of users' organizations in the two provinces. The NSC will be chaired by the Secretary, MLIMD.

There will be Provincial Steering Committees (PSCs) to provide complementary guidance and direction at the provincial level.

The NSC and the PSC will be serviced by Project Working Groups (National Working Group (NWG) and Provincial Working Group (PWG) comprising both full-time project staff and non-full-time senior government officials to be established at the National and Provincial levels. The Project Working Groups will assist and manage Project implementation.

The **Watershed Resources Management Teams (WRMTs)**, which will be established in each watershed will be the centerpiece of the SCOR Project organization structure. It will comprise representatives of users' organizations, NGOs, relevant line agencies and provincial/divisional government officials (on a non-full-time basis) and 3 full-time professional Project staff.

The Provincial Working Groups (PWGs) will work with their respective Provincial Councils and guide and assist the work of Watershed Resources Management Teams. The WRMTs, supported by User Groups/Federations/Councils will work closely with the relevant Divisional Government Agents (DGAs, formerly AGAs) and Divisional Secretariats.

Users will become involved in the Project in different ways.

a) Where groups already exist in the selected watersheds, e.g., in irrigated command areas, they will be brought into Project implementation through a process of consultation and assistance.

b) New user groups will be created with the Project playing a catalytic role where users of certain land, forest and/or water resources are not organized.

c) When sufficient institutional capacity and interest have been built up, federations of user groups within a watershed will be set up to work with the WRMTs in local-level and watershed-level planning for sustainable, productive utilization of resources.

Details of Project Organization are given in Chapter 4 sub-section 4.2.1.

Table 2. Proposed Technical Assistance.

Long-Term Technical Assistance	Project Activities (Prospective TORs)
National level	
Resources Management Specialist/Project Leader (with experience in Project Management)	All activities
Provincial level	
Institutional Development Specialists (2)	1c, 1g, 1h, 1i, 2a, 2c, 3a, 3c, 3e, 4d, 4c, 4d
Resources Management/Agriculture/ Agro-Forestry Specialists (2)	1b, 1e, 1f, 1h, 2d, 2e, 3c, 3d, 4a, 4b, 4c, 4g 1b, 1d, 1f, 3e, 4a
Entrepreneur Development Specialists (2)	1a, 1b, 1f, 1i, 3e, 4a
Catalyst Managers (Training coordination) (12)	1a, 1b, 1d, 1e, 1g, 1h, 1j, 2e, 3b, 4b + Institutional Development and Coordination

Short-Term Technical Assistance		Person-months recruited	
		Intly.	Locally
Resources Management in Watershed (Institutional Development Eng. Econ.)	1a, 1b, 2b, 4a) 1c, 1d, 1i, 4a, 4b,) 4e, 4g, Ig) 1f, 4a, 4c)	10	25
Resources Tenure Specialist	1b, 1f, 2a, 2b, 2c, 2d, 2e	-	2
Resources rights, law and policy	1c, 2a, 2b	1	9
Land titling and registration	2a, 2c, 2d	-	2
Small business promotion (including forest based industry)	1i, 1f, 2d, 1h,) 1j, 3f)	3	10
Credit programs	1f, 1g, 1h, 1i	-	2
Marketing programs	1f, 1g, 1h, 1i	-	4

Note: At the provincial level, one of the three senior experts will act as the Provincial Coordinator.

Short-Term Technical Assistance		Person-months recruited	
		Intly.	Locally
GIS/LIS/MIS	3a-f	3	4
Land use planning	3c, 4a, 4b	-	8
Environmental impact monitoring	1a, 1d, 2a, 2e, 1f, 1j, 3a, 4b, 4c	1	4
Training	1d, 1e, 1h, 3b, 3e, 4d)	5	25
Subtotal		23	87
To be added where needed		3	8
Total		26	95

Table 3 PROPOSED TOR FOR SUB GRANTS TO NGO'S/PRIVATE SECTOR ORGANIZATIONS

- Formation of user groups in areas where such groups have not been formed.
- Strengthening of existing user groups.
- To engage in training user group and users. This will involve the preparation of training programs manuals and their execution.
- Initiate business opportunities and establish and register user companies for specific commercial activities.
- Preparation of public awareness and educational programs for targeted audiences including user groups on natural resources management.
- To provide special employment opportunities to women and youth living in the project area.
- Experimentation with different categories of groups and different types of natural resources information system.
- Provide commodity support to user organizations and institutions in order to enhance their organizational capabilities in carrying out the functions under this project.
- Develop and provide appropriate technologies and marketing links between users' organizations and trading agencies.
- Help organize spread effects of the project to other areas.
- Provide support services to user groups.

All NGOs and the private-sector establishments interested in sub-contracts should first submit proposals which should demonstrate their capacities to handle the activities referred to above. The Project, however, will also provide small seed grants to small NGOs which have no significant track records, if the Project decides that such a grant can help them to develop their own institutional capabilities and thereby help the Project in the realization of its objectives. The private-sector establishment should demonstrate their capacities in resources management and their interest in working with user groups. Grants under this category to NGOs and the private sector are expected to vary from US$ 500 to US$ 10,000 per item (per organization) depending on the activity to be undertaken.

TOR FOR UNIVERSITIES AR&TI, RDRTI FOR SUB GRANTS ON RESEARCH ACTIVITIES

The Project will engage the services of suitable researchers from the Universities, RDRTI and the AR&TI to undertake research connected with the activities of the Project.

The main areas involved will be -

- To undertake a baseline survey of the selected watersheds.
- To carry out a constraints analysis in collaboration with local organizations.
- To develop an understanding of current status of resources tenure arrangements and their impacts on access to resources and on a sustainable basis.
- To engage in applied research regarding the activities of the Project with special reference to some of the experimentations to be carried out by the Project.
- To develop a simple M&E and a feedback system.
- To establish a policy dialogue in relation to policies, group formation, resource tenure arrangements and natural resource management. The professional staff in collaboration with relevant agency staff will evaluate the capacities and capabilities of respective academicians and institutions in handling the subjects to be undertaken. The proposals for grants should include among other details, a brief proposal including a work plan, staff involved and a time schedule. The individual grants will vary from US$ 2000 to US$ 5000.

TOR FOR SUB GRANTS TO INDIVIDUALS

To study the legal aspects of land and water resources and formulate proposals for:

a) Water Resources Act
b) Irrigation Ordinance
c) Procedure for Registration of Farmer Companies
d) Farmer Organization Law.

CHAPTER 3: FINANCE AND BUDGET PLAN

The SCOR Project component of NAREPP will be financed by three major sources:

I. Direct USAID financing,
II. Financing through PL 480 account; and
III. GOSL and other local contributions.

3.1 Aid Costs

A total of US $ 7.34 m will be provided by USAID over a period of 6 years, FY 93 through FY 98. The composition of AID financing will be as follows:

	Percentage
Technical Assistance (including all support staff)	57.0
Training (local and foreign)	6.1
Planning, M&E and spread mechanisms	1.7
Sub grants (user groups 2.5, NGO and private sector 1.4, Provincial and Divisional Secretariats 1.4)	5.3
Special Studies	2.7
Equipment and commodities	3.4
Information, education, and communication (IEC) material	0.7
Operation and maintenance of offices and vehicles	8.8
Contingencies	4.3
Inflation	10.0
	100.0

NOTES:
1. USAID costs may be reduced to US$ 7 million if part of short term international staff and training costs are provided by the NAREP Project or from other sources.
2. Allocations for user grants (loans) and IEC materials are **inadequate.** It is expected that additional allocations be made through PL 480.

3.2 Financing Through PL 480

It is proposed to allocate the following amounts from the PL 480 Title III program:

a.	User grants, a minimum of	-	US$	562,000
b.	About 50 production group loans @ US$ 20,000	-	US$	1,000,000
c.	Commodity support:			
	Divisional Secretariats	-	US$	100,000
	Provincial Secretariats	-	US$	100,000
d.	Spread effects, mainly for catalysts, Information, Education and Communication (IEC) material and workshops	-	US$	200,000
			US$	1,962,000

In addition, PL 480 resources may be used to provide guarantees against Bank loans received by production companies.

3.3 GOSL and Other Local Contributions

These will include the time spent with the catalysts and investments made by approximately 25,000 participating households in the target watersheds. It is assumed that each of the households will increase its investments in the land and water resources by approximately one percent of household income, or US $ 20 per year. Over five years, this will represent a contribution of approximately US $ 2.5 million. Additionally, it is assumed that each household spends US $ 10 worth of time each year with the SCOR Project catalysts. For about 25,000 households over an average period of about 4 years, the net worth of time spent would be about US $ 1 million.

Moreover, it is assumed that Senior Government Staff would spend US $ 4,000/yr worth of time on the SCOR Project. Other professionals would spend US $ 10,000/yr in various activities (eg., training) involved with the SCOR Project. For 6 years, these services will provide US $ 84,000 worth of the SCOR Project inputs.

Hence, the total worth of local contributions in these categories would be about US$ 3.584 million.

The USAID contributions are summarized in Table 4. Next, Table 5 gives a summary of Technical Assistance, and Staffing Costs while Table 6 indicates these inputs in person years/person months over the 6 - year project period. These tables are followed by explanatory notes.

TABLE 4
SCOR PROJECT SUMMARY COST ESTIMATE AND FINANCIAL PLAN (US $ '000)

COMPONENT	FY 93	FY94	FY95	FY96	FY97	FY98	TOTAL
1. TECHNICAL ASSISTANCE							
1.1 Professional Long Term	417	522	554	554	482	318	2847
1.2 Professional Short Term	108	148	168	168	128	85	805
1.3 Support Staff	81	93	97	97	97	71	536
2. TRAINING							
2.1 Training Workshops Local	23	30	40	50	20	10	173
2.2 Short Term Foreign	30	70	70	55	50	-	275
3. PLANNING, M&E AND SPREAD EFFECTS	20	20	22	22	22	21	127
4. SPECIAL STUDIES	50	70	60	10	10	-	200
5. SUB GRANTS							
5.1 User Grants	100	87	-	-	-	-	187
5.2 NGO/Private Sector	20	20	20	20	20	-	100
5.3 Divisional Secretariat	50	20	10	-	-	-	80
Provincial Secretariat	20	-	-	-	-	-	20
6. EQUIPMENT & COMMODITIES	249	-	-	-	-	-	249
7. INFORMATION, EDUCATION AND COMMUNICATION MATERIAL	-	10	10	10	10	-	50
8. OPERATION & MAINTENANCE							
8.1 Office	72	72	72	72	72	72	432
8.2 Vehicles	35	35	35	35	35	35	210
SUB TOTAL	1275	1197	1158	1093	946	622	6291
CONTINGENCY 5%	64	60	58	55	47	31	315
INFLATION 5%	0	60	119	172	204	180	735
TOTAL	1339	1317	1335	1320	1197	833	7341

TABLE 5
LONG TERM TECHNICAL ASSISTANCE AND STAFFING SUMMARY

POSITION/LOCATION	NUMBER OF UNITS PER PROJECT YEAR YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	TOTAL
I. PROFESSIONAL LONG TERM							
Project Leader (internally recruited (I, COL)(1)	1.0	1.0	1.0	1.0	1.0	0.8	5.8
Environment/ Agricultural Specialist (NCP, SP) (2)	2.0	2.0	2.0	2.0	2.0	1.0	11.0
Institutional Development/ Ext/Training Specialist (NCP, SP) (2)	2.0	2.0	2.0	2.0	2.0	1.0	11.0
Enterprise Dev/ Marketing Specialist (NCP, SP) (2)	1.0	2.0	2.0	2.0	2.0	1.0	10.0
Catalyst Manager/ Trainer (NCP, SP) (12)	6.0	8.0	12.0	12.0	8.0	4.0	50.0
Project Associate/ M&E (COL.)(1)	0.5	1.0	1.0	1.0	1.0	0.5	5.0
Research Assistant (NCP, SP, COL) (3)	3.0	3.0	3.0	3.0	3.0	3.0	18.0
Catalyst (NCP, SP) (30)	15.0	30.0	30.0	30.0	20.0	15.0	140.0
SUB TOTAL	30.5	49.0	53.0	53.0	39.0	26.5	250.8

POSITION/LOCATION	NUMBER OF UNITS PER PROJECT YEAR YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	TOTAL
II. PROFESSIONAL SHORT TERM							
International PM	3.0	5.0	6.0	6.0	4.0	2.0	26.0
National PM	16.0	16.0	16.0	16.0	16.0	15.0	95.0
SUB TOTAL	19.0	21.0	22.0	22.0	20.0	17.0	121.0
III. SUPPORT STAFF							
Administrative Officer (COL, NCP, SP) (3)	3.0	3.0	3.0	3.0	3.0	3.0	18.0
Finance Officer (COL) (1)	1.0	1.0	1.0	1.0	1.0	1.0	6.0
Secretaries (COL, 1, NCP 2, SP 2) (5)	5.0	5.0	5.0	5.0	5.0	3.0	28.0
Drivers (COL, 1, NCP 3, SP 3) (7)	5.0	7.0	7.0	7.0	7.0	5.0	36.0
Other miscellaneous (4)	2.0	3.0	4.0	4.0	4.0	2.0	19.0
SUB TOTAL PM	16.0	19.0	20.0	20.0	20.0	14.0	109.0

* Number of Positions is in parenthesis.
1. Internationally recruited (only the Project Leader).
COL = Colombo, NCP = North Central Province, SP = Southern Province.

TABLE 6
SCOR PROJECT TA EXPENDITURE BY FY $'000 - AID COSTS

INPUTS	UNIT COST Per Year	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	TOTAL
PROFESSIONAL LONG TERM								
Project Leader (1)	165	165	165	165	165	165	132	957
Environmental Agricultural Specialist (2)	25	50	50	50	50	50	25	275
Institutional Training Specialist (2)	25	50	50	50	50	50	25	275
Entrep. Development/ Marketing Specialist (2)	25	25	50	50	50	50	25	250
Catalyst Manager/ Training Coord. (12)	8	48	64	96	96	64	32	400
Project Associate M&E (1)	8	4	8	8	8	8	4	40
Research Assistant/ Officer (3)	5	15	15	15	15	15	15	90
Catalyst (30)	4	60	120	120	120	80	60	560
SUB TOTAL		417	522	554	554	482	318	2847
PROFESSIONAL SHORT TERM								
International (24)	20PM	60	100	120	120	80	40	520
National (95)	3PM	48	48	48	48	48	45	285
SUB TOTAL		108	148	168	168	128	85	805

INPUTS	UNIT COST Per Year	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	TOTAL
SUPPORT STAFF								
Administrative Officer (3)	5	15	15	15	15	15	15	90
Finance Officer (1)	5	5	5	5	5	5	5	30
Secretaries (5)	5	25	25	25	25	25	15	140
Drivers (7)	4	20	28	28	28	28	20	152
Other (6)	4	16	20	24	24	24	16	124
SUB TOTAL		81	93	97	97	97	71	536
TOTAL		611	743	779	739	667	454	4188

TRAINING

For about all types of training considered below, the subject areas will be :

- Enterprise development
- Group dynamics
- Environment
- Financial management.

Training Workshops:

Target groups=	User groups (base units), 1,000 UG		
	Users organizations, 100 UO		
	Sub Councils, 15 SC		
	Watershed Councils, 4-6 WSC		
	NGO and Private Sector (about 100)		
	Government Staff -	National level	20
		Provincial level	50
		Divisional level	150

User Groups (base units) (1,000)

1,000 x 3 trained for 4 days on four occasions (ie., one-day workshops); 25 participants will participate in a workshop.
Therefore number of workshops = 3,000/25 x 4 = 120 x 4 = 480
Number of training days = 12,000

Users Organizations (100)

100 x 3 trained for 4 days on two occasions (2 days each); 25 persons will participate in a workshop.
Therefore number workshops = 300/25 x 2 = 24
Number of training days = **1,200**

User Councils and Sub Councils (15 SC and 5 WSC)

20 x 4 trained for 4 days on two occasions (2 days each); 20 participants per workshop.
Number of workshops = $\frac{20 \times 4 \times 2}{20} = 8$

Number of training days = **320**

NGO and Private Sector (100 Participants)

100 trained for 4 days on two occasions (2 days each); 20 participants per workshop.
Number of workshop = $\frac{100 \times 2}{20} = 10$

Number of training days = **400**

Government Staff (50 Provincial Level, 150 Divisional Level, 20 National Level)

220 trained for 4 days on 2 occasions (2 days each); 20 participants per workshop.
Number of workshops = $\frac{220 \times 2}{20} = 22$

Number of training days = 880

Total number of workshops = 544
Total number of trained locally (except planning and monitoring workshops) = 3,700
Total number of person days trained = 14,800.
Average cost per person day = Rs. 500 (incl. costs of external trainers, training material, accommodation, transportation, food etc.)

SHORT TERM TRAINING

These could range from 2 weeks' study tours within the region to 2 months' training within the region or in the United States of America. Assume most of the training is in the region.

Participants and type of training

	Study tours	**Short term Training**
National level	4	-
Provincial level	6	4
Divisional level	15	6
User Representatives	40	-
	65	10

Cost = US$ 65 x 3000 + 10 x 8000 = US$ 275,000

Timing: short term academic - 2, 4, 4, 0, 0, years
User representatives - 0, 15, 10, 20, 10, 0 years.

SPECIAL STUDIES

10 studies @ US$ 20,000 (timing: 1, 4, 3, 1, 1, 0 years)

SUB GRANTS

1. **User Groups**

   a. 1,000 user groups grants @ US$ 750 will be provided by the Project. Out of these, 250 user group grants (US$ 187,000) will be provided by the Project within the first 18 months of project implementation. The balance (US$ 562,500) will be provided through PL 480, Title 111, PVO. account)

   b. about 10 production group loans @ 20,000 to be obtained through financial institutions and may be guaranteed by SCOR Project. No funds are budgeted for this. Part of PL 480 sources may be used (freezed) to provide the guarantee.

   c. In addition, about 50 production group **loans** @ 20,000 will be provided for production companies through PL 480, title III, PVO account (US$ 1 million).

2. **Sub Grants to NGOs and Private Sector**

About 10 grants to selected NGOs and Private Sector firms to undertake work specified in Section 2.8.1 (average amount per grant = US$ 10,000).

3. **Sub Grants for Divisional Secretariats and Provincial Secretariats**

Divisional Secretariats

Computer, mapping and survey equipment, motorbike etc., @ US$ 10,000 x 8 secretariats = US$ 80,000

As this is not adequate for efficient operation of Divisional Secretariats an additional amount of US $ 50,000/Secretariat will be provided through PL 480 (US $ 50,000 x 8 = US $ 400,000).

Provincial Secretariat

Same as for Divisional Secretariats

US$ 10,000 x 2 = US$ 20,000 direct support
US$ 50,000 x 2 = US$ 100,000 through PL 480.

EQUIPMENT AND COMMODITIES

1. **Vehicles**

7 four-wheel driven vehicles (3 for each province and one for Colombo) @ US $ 15,000 = 105,000
12 motorbicycles for Catalysts Manager @ US$ 1750 = US$ 21,000
30 push-bicycles (or transport allowance) for Catalysts @ US$ 200 = US$ 6000

Total for motor vehicles and bicycles (all year 1) = US$ 132,000.

2. **Training Equipment**

(Video, slide projector and screen, camera, overhead and other)
US$ 5,000 each for 3 sets (all year 1) = US$ 15,000.

3. **Computer Systems**

8 desktop systems including hardware, software, UPS etc., @ US$ 3500 = US$ 28,000
8 lap top/note book models @ US$ 1750 = US$ 14,000

Total (all year 1) = US$ 42,000.

4. **Other Office Equipment**

Furniture, cabinets, photocopiers, fax machines, air conditioners, etc., US$ 20,000/office x 3 offices = US$ 60,000 (all year 1)

Total equipment = US$ 249,000

(Commodities provided to Divisional and Provincial Secretariats are included under Section 3 above).

OPERATION AND MAINTENANCE

Vehicles (7 four wheel, 12 motor bicycles, 30 push bicycles, photocopiers, training equipment etc.,) US$ 35,000/yr x 6 years = US$ 210,000.

Office support (inc. utilities, rent) and O&M @ US$ 2000/m x 12 m x 6 years x 3 offices = US$ 432,000.

INFORMATION, EDUCATION AND COMMUNICATION (IEC) MATERIAL

@ US$ 10,000/ yr x 5 years = US$ 50,000

An additional amount of US$ 100,000 may be allocated for IEC materials, in order to spread the tested innovations to non-project areas. This may come through PL 480 account.

PLANNING, MONITORING AND EVALUATION AND SPREAD EFFECTS

a. **National Steering Committee**

US$ 1,000/ 1/2 day meeting x 2/year x 6 years	= US$	12,000

b. **National Working Group**

US$ 750/meeting x 4/year x 6 years	= US$	18,000

c. **Provincial Steering Committee**

US$ 1,000/1 day meeting x 3/year x 6 years x 2 Provinces	= US$	36,000

d. **Provincial Working Group**

US$ 500/meeting x 2/year x 6 years x 2 Provinces	= US$	12,000

e. **WRMT**

US$ 200/ 1/2 day meeting x 8/ year x 6 years x 3 watersheds (Average)	= US$	28,800

Total a to e	= US$		106,800
	approximately	US$	107,000

f. **Planning and Monitoring Workshops to Augment Spread Effects**

US$ 2,000/workshop x 10 workshops	= US $	20,000
Total a to f	= US $	127,000

An additional amount of US $ 100,000 may come through PL 480 account to enhance spread effect. These resources, if available will be utilized for workshops, seminars, meetings, etc.

NOTE: Audit allocation is built-in to indirect costs (28%) which are included in all items excluding equipment and sub grants.

THE TOTAL USAID BUDGET MAY BE REDUCED TO US$ 7 MILLION IF PART OF SHORT-TERM INTERNATIONAL STAFF AND TRAINING COSTS ARE COVERED BY NAREP.

Contingency : @ 5% overall

Inflation : @ 5% compounded.

(ie.,	Year 1	=	0
	Year 2	=	5%
	Year 3	=	10.25%
	Year 4	=	15.76%
	Year 5	=	21.6% and,
	Year 6	=	27.6%).

CHAPTER 4 :IMPLEMENTATION AND MONITORING PLAN

4.1. Introduction

The central arena of project implementation will be the selected watersheds in the North Central and Southern Province and the main focus of activity will be on formulating, pilot-testing and application of innovative agricultural production models of different modes, optimizing the sustainable utilization of irrigated as well as non-irrigated lands and other natural resources.

The Project will first identify the user groups and along with them assess the current patterns of natural resources use and the capacities and capabilities of these groups as well as those of non-governmental and governmental organizations. The Project will then undertake an analysis of the constraints inhibiting improved and environment-friendly resources utilization, the Project will work with the different groups and help formulate and implement a systematic and comprehensive development plan for the watershed selected. The details of implementation of specific activity areas are discussed under **sub-section 4.3**.

In line with the objectives of the Project, the implementation strategy will be focused on testing and internalizing the new production modes and institutional approaches and processes of the Project within user groups, relevant government structures and other groups. This will contribute significantly to long-term, sustained and profitable management of natural resources and an enhancement of the share of responsibility borne by user groups for these activities.

While concentrating its resources and action in the selected pilot areas, the Project will keep in appropriate focus, the need to create the conditions for successful project processes and activities to have a 'spread-effect.' With this end in view, the Project will invite and secure the participation of groups, both governmental and nongovernmental, from outside the Project areas in its learning process. The details of this plan are set out under **sub-section 4.7**.

The Project will blend performance disbursements, direct support and technical assistance. Performance disbursements will be the financial core of the project, representing approximately 40% of total Project funds. They will be organized into a series of long-term, cumulative streams reflecting increasing efforts and accomplishments. An indicative list of performance disbursement principles, indicators and disbursement rates is given in sub-section 4.4.7.

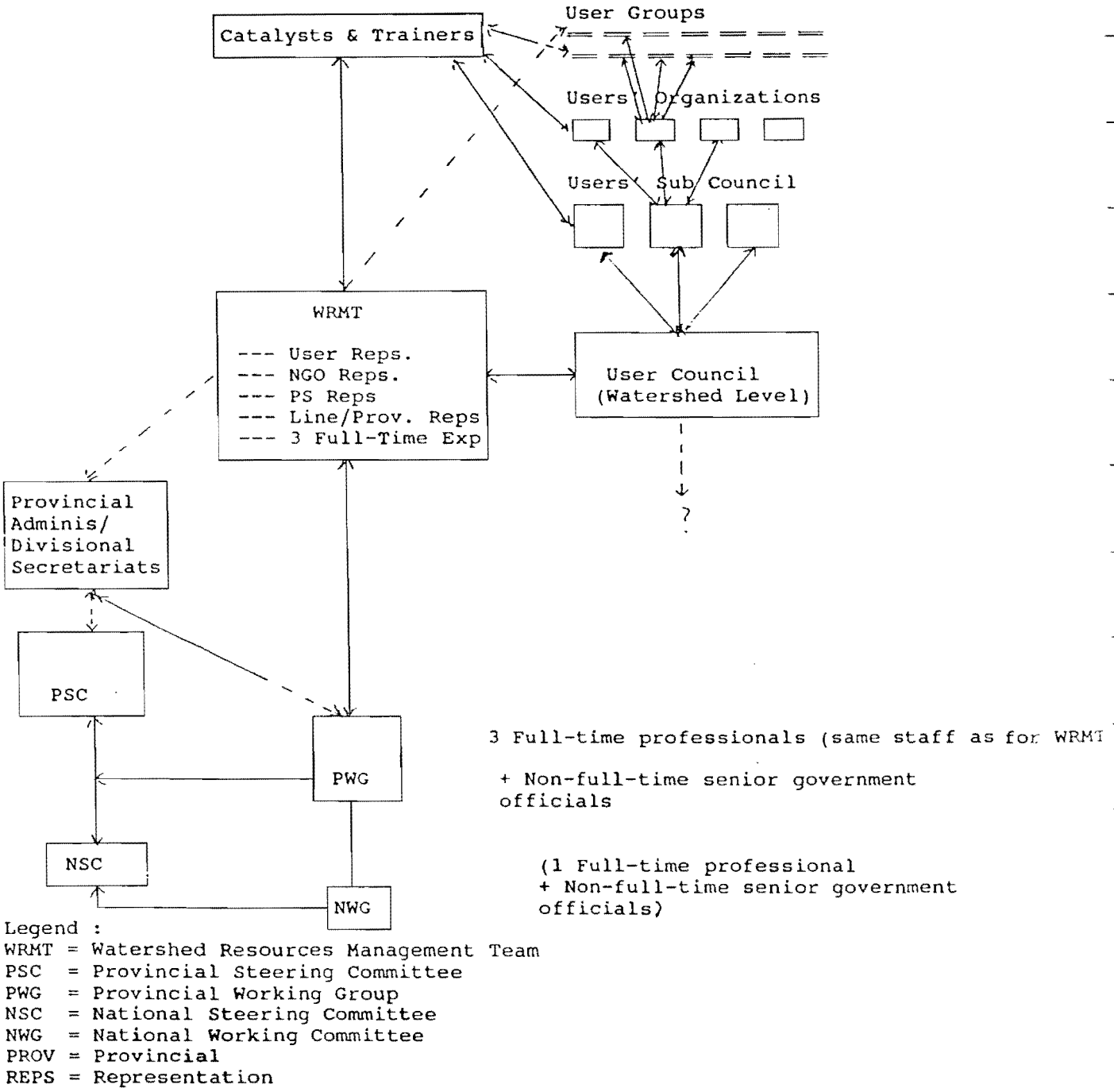
The Project organizational structure will emphasize its catalytical and facilitating role. It will provide for a high degree of participation by persons involved in land and water resources and environmental management at different levels, through planning, implementation and monitoring.

4.2. Project Management

4.2.1. Organization

The overall organizational structure for Project implementation and coordination is presented in Figure 1.

Figure 1. SCOR Project organizational structure.



Legend :
WRMT = Watershed Resources Management Team
PSC = Provincial Steering Committee
PWG = Provincial Working Group
NSC = National Steering Committee
NWG = National Working Committee
PROV = Provincial
REPS = Representation

The primary responsibility for Project operation will lie with the Ministry of Lands, Irrigation and Mahaweli Development as the sponsoring ministry, but this responsibility will be shared with other ministries, particularly the Ministries of Agricultural Development and Research, Environment and Parliamentary Affairs and Policy Planning and Implementation.

The Project will be governed by a **National Steering Committee**, within which there will be National and Provincial representation. There will be **Provincial Steering Committees** to provide complementary guidance and direction at the Provincial level.

These Steering Committees will be serviced by **Project Working Groups** (PWGs) at the national and provincial levels. The National Project Working Group, however, will be an implementing body with one full-time specialist, and relevant government officials working on an intermittent basis. The provincial working group too will have three full-time specialists, and relevant provincial level officials working similarly on an intermittent basis.

At the field-level **Watershed Resources Management Teams which will be established as ongoing entities, will be the centerpiece of SCOR Project organization structure.** The full-time members of the Provincial Working Core Group will also work in these Teams.

Unique characteristics of this organizational structure are:

a) Stronger organizations (working groups) are at the lower levels where project activities are directed;

b) Lower levels are adequately represented at the higher levels of the hierarchy. This will ensure vertical integration and effective participation.

c) Except for the participation of a few specialists in working groups, no new structures are proposed.

The Project will engage the active cooperation of national and provincial level agencies, as well as from elements of the nongovernmental and private sectors including the representatives of user groups. The proposed organization recognizes the authority of the government agencies at the national, provincial, and divisional levels and establishes mechanisms by which effective coordination can be achieved.

4.2.1.1. National Steering Committee (NSC)

The NSC will provide overall leadership, policy direction for the execution of the Project, supervision and coordination, and will establish effective linkages between the Project and the government at the national and provincial councils levels.

The NSC will comprise key policymakers representing the Ministries of Lands, Irrigation and Mahaweli Development; Agricultural Development and Research;

Environment and Parliamentary Affairs; Policy Planning and Implementation, and other relevant government agencies; representatives from the North Central Provincial Council and the Southern Provincial Council; from the nongovernmental sector; and from users' national and provincial-level councils which may be established in the future.

The NSC will be chaired by the Secretary, Ministry of Lands, Irrigation and Mahaweli Development.

The NSC will meet at least once every six months. These meetings will be organized in the form of one to two-day workshops with well-defined objectives and tasks to be accomplished.

4.2.1.2. Provincial Steering Committee (PSC)

Provincial Steering Committees will be established under the auspices of the Provincial Councils in the selected provinces to provide guidance and direction in planning and implementation and supervision of those activities carried out in the province. These committees will coordinate the activities of the provincial and line agencies in the selected pilot watersheds through the **Watershed Resources Management Teams**. The PSCs will be represented on the NSC to participate in Project governance.

The PSC will include the Chief Secretary, Secretaries in-charge of land, water, irrigation and the environment, relevant divisional-level officials, representatives of resources users' organizations, and from other relevant agencies and interest groups.

The PSC will be chaired by the Chief Secretary of the Provincial Council.

The PSC will meet at least once every three months. These meetings too will be organized in the form of workshops.

4.2.1.3. Watershed Resources Management Team (WRMT)

The Watershed Resources Management Team will plan, implement, monitor and evaluate the watershed activities. The WRMT will consist of staff from the relevant provincial, divisional and government line agencies, representatives of the nongovernment sector (NGOs, private sector, representatives of user groups and selected resource persons from the universities, if necessary). The government officials represented in the WRMT will interact with the other members of the group effectively to increase its working capacity and become institutionalized. All the full-time technical members of PWG will automatically become members of WRMT. They will function as facilitators while providing technical assistance.

The WRMT's working arrangements will be decided upon by its members.

4.2.1.4. Project Working Groups

Project implementation will be assisted and managed by **Working Groups** comprising senior government officials working on a non-full-time basis as well as Project staff at both the national and provincial levels. The two Provincial Project Working Groups will work under the direction of the respective Provincial Steering Committees. Their activities will be coordinated by the National Working Group.

The National Working Group (NWG) will be staffed with one full-time professional selected internationally. He will represent relevant multiple disciplines and will be designated as Project Coordinator. The Project Coordinator will function as Secretary of the NSC.

Each Provincial Working Group (PWG) will be staffed with three full-time professionals and one will be designated as Provincial Project Coordinator. The Provincial Project Coordinators will function as Secretaries to PSCs. The PWGs will be assisted by short-term specialists and a complement of support staff.

The Project Working Groups will:

a) provide professional expertise for project implementation
b) prepare work plans and budgets
c) conduct regular periodic reviews and analyses
d) arrange for specialist consultations
e) prepare terms of reference for consultancies, monitor and evaluate them
f) provide guidance and technical advice to the NSC and PSC
g) develop close working relationships with relevant projects, programs and agencies addressing land, water, irrigation and environmental issues
h) monitor project progress and performance
i) sub-contract project work to users' organizations, NGOs and others, and monitor performance of the contractors
j) any other functions that may be decided upon by the NSC or PSCs.

4.2.2 Formulating Annual Project Plans

The Working Groups will be responsible for the preparation of an Annual Project Implementation Plan, to be developed in close consultation with the WRMTs. The plan will include:

* a statement of the objectives for the year,
* specific activities to meet the objectives,
* human resources requirements for implementation, and
* budgetary requirements and anticipated sources.

4.2.3. Budgetary Allocations

After review of the Annual Project Plans, the NSC will recommend the budgetary allocations. Where resources are to come from individual agency budgets, the competent authority will approve the allocations. Coordination with the Ministry of Finance and USAID in these matters will be provided by the National Working Group and the NSC as the GOSL and USAID will need to make budget allocations official.

4.3. Selection of Watersheds and Step-Wise Implementation Schedule

The pilot watersheds will be divided into three "sub-sets." Project implementation will begin in the first year with the first sub-set of 2 watersheds (selected from NCP and SP) covering about 20,000 ha. The second and third sub-sets of water sheds will be added in the second and third years, respectively. In aggregate, the SCOR Project implementation will include a core group of about 4-6 watersheds covering about 30,000 ha, in the two provinces. Additionally, the Project will facilitate the expansion/spread of tested innovations to other watersheds both within and outside the selected provinces.

A 4-phase implementation program is planned for each of the "subsets" of pilot watersheds:

a) **Planning and organizing phase - year 1:**

In the first year, the WRMT will first initiate dialogue with the existing and potential users, organize user groups, conduct a **participatory assessment** of (present) land and water use patterns, capability of institutions including government agencies, NGOs, etc., and also a constraints analysis. Based on these, the WRMT will design, through a participatory approach, an integrated plan to improve land and water resources management. During this phase, (while planning for augmenting the resources base, for example, tree planting) efforts will be made to enhance the utilization of existing resources through known technologies. This will also provide an economic incentive for existing and potential users to organize into groups. Based on the learning from the design process, two such examples are cited below:

i. Supplementary irrigation for cash crops in the selected highlands in the wet zone.
ii. Linking user groups with markets to improve their income.

b) **Experimentation and replication phase - 2nd and 3rd years:**

Innovative production and protection modes will be tested and implemented in this phase. For instance, the production companies will use exploitation combined with augmenting existing forest resources base for the extraction of non-wood forest resources.

In addition, innovations will be tested in the institutional and tenurial areas.

c) **Consolidation phase - 4th year**

Phasing out of external inputs, such as project financing, technical assistance, etc., will begin in year 4 in respect of the watershed selected in year 1. However, a rigorous self-monitoring and evaluation mechanism will be carried out to enhance self-reliance of user groups, NGOs, etc., and as a feedback mechanism for the working groups.

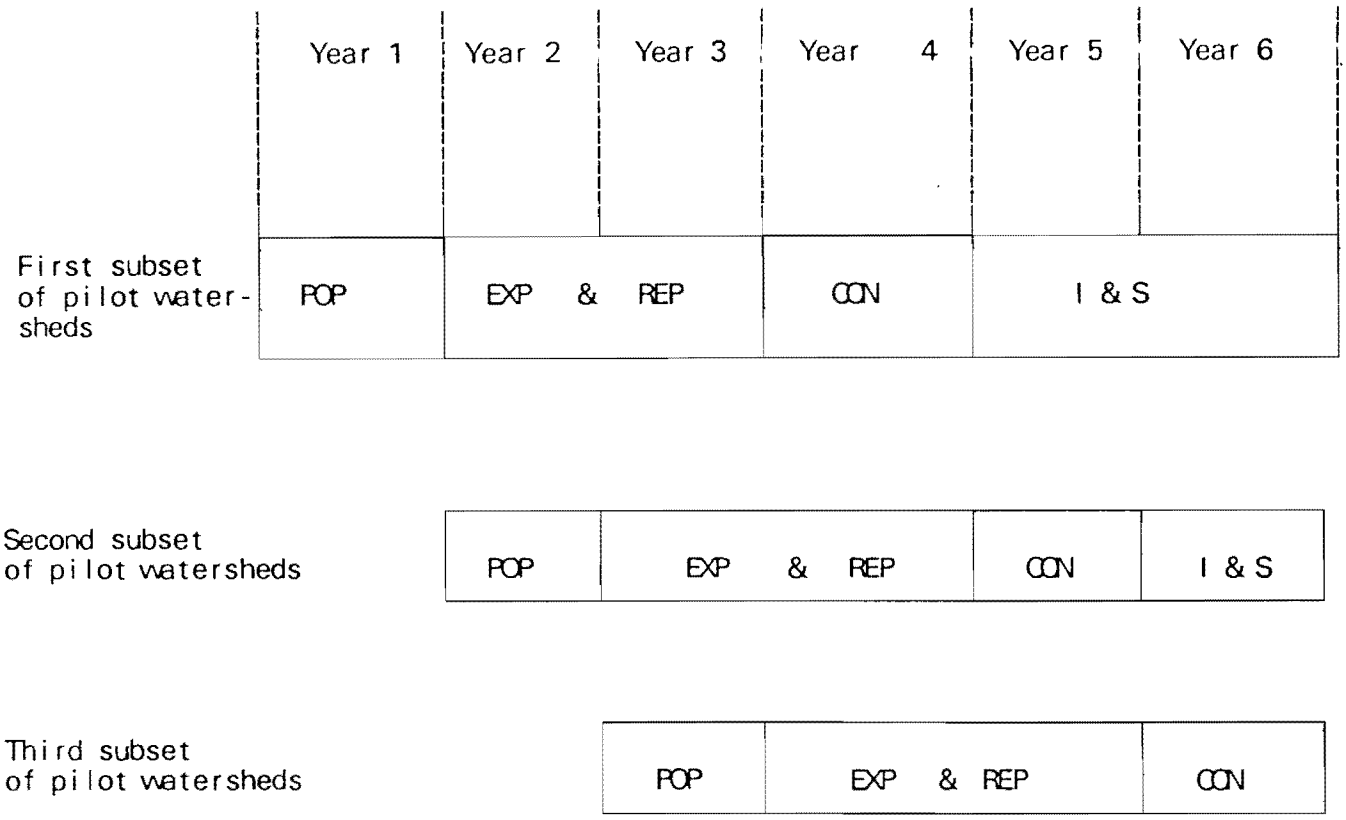
d) **Internationalization and spread effects - 5th and 6th years:**

The WRMT will focus on the mechanisms designed to enhance spread effects. It should be noted here that this mechanism has been already initiated in year 4.

In the latter two phases, the WRMT will provide the services of catalysts, on a reduced scale, if necessary. Only the first subset of watersheds will complete the 6-year cycle. However, by the end of the Project, the user groups and supporting actors (government agencies, NGOs, the private sector, etc.) are assumed to have improved their capacity to implement a project of this nature. With these and spread effects, the second and third subsets of watersheds and many other watersheds both within and outside pilot areas should have reached a higher degree of self-reliance.

The step-wise implementation schedule is illustrated in Figure 2. The details of implementation of specific activities are discussed under 4.3.1, 4.3.2, 4.3.3 and 4.3.4.

Figure 2 : Step-wise implementation schedule.



Notes:

1. POP - Planning and Organization Phase

   EXP & REP - Experiments & Replication

   CON - Consolidation

   I & S - Institutionalization & Spread Effects

2. Mechanisms to augment spread effects will be initiated in year 4.

3. In addition to new modes of Land and Water Resources and environmental management, institutional and legal support are also included here.

4.3.1. Strengthening Resources User Groups (UG)

4.3.1.1. Survey of Existing Local Organizations

The survey to be carried out initially in each watershed will provide a baseline for Project evaluation as well as a guide to Project implementation. The survey for the first two watersheds, one in each of the two provinces, will be carried out in year 1. The surveys for the second pair of watersheds will be carried out in year 2. The surveys will be under the responsibility of the WRMT, but may be contracted to NGO or university personnel where this will contribute to Project implementation and capacity-building objectives.

4.3.1.2. Constraints Analysis

The constraints analyses will be the responsibility of the PWGs with collaboration of the WRMTs. They will be carried out in conjunction with the survey of local organizations (4.3.1.1.) and will include sample surveys of rural households in different resources user categories within the selected watersheds and review of available data on the physical environment. Data/conclusions will be reviewed with local communities and officials in the watershed areas, with reports prepared by the end of years 1 and 2. Analyses will be carried out by the PWGs, in conjunction with the WRMTs.

4.3.1.3. Legal Status and Powers

Responsibility for this clearly rests with GOSL, but the NWG/PWGs will assess the need for revisions in legal enactments and implementing regulations so that resources user groups in the pilot areas and elsewhere in Sri Lanka have adequate legal recognition and standing to carry out resources management activities. Coordination with the DAS and IMD will be essential, drawing on the legal provisions of statutes that they implement to the extent possible. This activity will begin in year 1 or 2 and should be completed by year 5.

4.3.1.4. User Group Creation

The creation of UGs in those parts of the watersheds without effective groups will be the responsibility of the WRMTs with the support of the PWGs. This activity will start in year 1, with strengthening continuing through year 6. Implementation will be through the WRMTs and/or sub-contract to a NGO. Whereas there is less experience with organizing resources users outside irrigated agriculture, this activity will be initially as much experimentation as

implementation. The recruitment, training and deployment of organizers and the development of appropriate approaches, methodologies and reinforcement will present special challenges to the Project. The organizers will also work with existing UGs to strengthen their capabilities for shared control of resources.

4.3.1.5. Training for User Groups and Trainers

The responsibility for this activity will lie with the PWGs, and the activity will start with preparation of training materials and methodologies in year 1. The organizers discussed under 4.3.1.4. will be utilized in this activity, which will continue through year 6. Effectiveness of training activities will be evaluated in year 3 and implementation accordingly revised and improved.

4.3.1.6. Economic/Commercial Opportunities for User Groups

Responsibility for this activity will be with the PWGs, with support from the WRMTs and in close coordination with the UGs and other private sector groups. Planning will begin in year 1, where the attention will be to create economic opportunities from the existing resources base in an organized manner. Identifying, doing feasibility analyses and experimentation with new lines and techniques of production that are environmentally benign will present a challenge, but opportunities once developed should go beyond the pilot watersheds. This activity will include training, technical assistance and special studies and will extend through the life of the project. Benefits would go to individuals and households, but their being channeled through groups will increase Project efficiency and enhance the commitment of members to UGs. Development of appropriate technologies and marketing links will be necessary which will be accomplished by NGOs and private-sector firms. User group involvement in selecting and evaluating opportunities, should avoid the kind of mistakes common in the past.

4.3.1.7. Special Opportunities for Women and Youth

Responsibility for implementing these lies with the WRMTs with support from the PWGs, the UGs and other private-sector groups. This activity will be associated with 4.3.1.6. but is separately identified to ensure that attention is paid to this. Planning would start in year 2, after watersheds are selected and baseline information is in hand. Implementation may involve sub-contracts with or consultants from one or more NGOs particularly concerned with enhancing women's opportunities. Similar efforts would be made for creating youth opportunities. This activity is included because existing user groups, made up mostly of adult males, have proposed that income opportunities for women and youth will help to maintain the solidarity of rural communities and enhance their capacity to manage their resources with a long-term perspective.

4.3.1.8. Supporting Services and Facilities

Activity in this area is the responsibility of the PWGs with the cooperation and coordination of the WRMTs, UGs, banking institutions, and other private-sector groups. Planning and implementation in respect of activities which can be adopted immediately will start in year 1, with experimentation in respect of other relevant activities starting in year 2. It is not known how best to provide support services and facilities to user groups. Government programs in the past have not contributed much to self-managed productive activity. Experience and methods to help this Project promote these support services and facilities can be gained from working with user groups already in place such as under several ISMP-assisted schemes which have spontaneously undertaken the kind of intensification of production sought under SCOR. Arrangements for access to extension advice and credit will be facilitated by the organizers referred to above; particularly helping user groups to store (eg., paddy) and market (eg., vegetables, fruits, etc.,) their products collectively can generate substantial income improvements that will solidify the strength of resources user groups.

4.3.1.9. Production Companies

Support for the development of production companies or other forms of organizations that can make production more efficient and expanded will be the responsibility of the WRMTs and UGs, with support from the PWGs, in close cooperation with the private sector. Experimentation would begin in year 3, with full implementation starting in year 6 in pilot areas. Some experimentation could start earlier with UGs under ISMP where these need only a little assistance. Production organizations would operate with monitoring of their environmental effects, which is not possible with scattered individual producers.

4.3.2 Improving Resources Tenure Arrangements

4.3.2.1. Regulatory and Legal Mechanisms

A review/analysis for the existing situation at watershed, division, district, province and national levels will be conducted under the responsibility of the PWGs. Year 1 will result in a policy/process review paper to be considered in a national workshop by the end of that year. This will initiate the policy and process reform dialogue activity (4.3.2.3). Implementation will be assisted by sub-contract with university or similar academic groups. Necessary changes in regulations are anticipated to be implemented starting in year 3.

4.3.2.2. Resource Access and Tenurial Arrangements

Developing understanding of the current status of resource tenure arrangements and their impacts on access to resources and on sustainable productivity will be the responsibility of the NWG/PWGs, with NGO and/or university assistance. The research phase will be started in year 1, with dialogue in years 2 and 3. Monitoring and follow-on research will continue to the end of the project. There are a great variety of tenurial arrangements to be assessed for their effect on natural resources use, such as sharecropping, absentee ownership, and rotational cultivation (thattumaru and kattimaru) and also tree tenure.

4.3.2.3. Policy and Process Reform

This activity will be the responsibility of the NWG/PWGs, with support from relevant agencies. The process of dialogue has already been initiated in the course of Project design, building upon the studies, workshops and discussions provided for under IMPSA. This activity will continue for the life of the project.

4.3.2.4. Land Titling

Formulating this activity to accelerate land titling will be the responsibility of the NWG/NSC though implementing this on an experimental basis will devolve to the PSCs and PWGs. The activity will be initiated in year 2, with experimentation on procedures in years 2 and 3 and implementation for the remainder of the life of the project. Pilot projects would test alternative systems of granting titles, with streamlined, accessible land registries at the divisional level. Densification of the national geodetic control grid, contracted at least in part to private surveyors would facilitate implementation. The rate of cadastral survey and granting of titles could be accelerated by new financial arrangements. Research, monitoring and evaluation of the titling program would be an important part of this activity.

4.3.2.5. Land Consolidation

This activity will be the responsibility of the WRMTs, with assistance from the PWGs, UGs and other appropriate government agencies. It will start in year 3, building upon the knowledge generated in the initial years of the project and the rapport build-up with UGs. The first phase, years 3 and 4, will be for experimentation, building on experience under 4.3.4.1, with further implementation in years 5 and 6. The purpose is to raise land use efficiency so that there is less pressure on less robust land resources.

4.3.3. Strengthening Institutional Capacities

4.3.3.1. Information Systems

The NWG/PWG/GOSL will have primary responsibility for this activity, building upon the understanding to be developed with the UGs, DSs, and PCs. Work will start in year 2, with modification and extension continuing through the life of the project. The systems will utilize existing data to the extent possible and will coordinate with the ADB-assisted project with LUPPD which is introducing GIS at the district level. As SCOR is working at divisional and provincial levels, there should be complementary efforts between the two projects with regard to information systems. SCOR will also undertake **more than GIS**.

4.3.3.2. National-Level Departments and Agencies

Implementation will be the responsibility of the NWG with the effort starting in year 2 through the life of the project. Raising the level of staff interest and qualification could be achieved through workshops, seminars, study tours and short-term training.

4.3.3.3. Provincial Councils and Staffs

Implementation will be the responsibility of the NWG/PWGs/GOSL, in parallel and in conjunction with the activity for national-level departments and agencies (4.3.3.2.). This work will start in year 2 and continue through the life of the project, involving workshops, seminars, study tours and short-term training.

4.3.3.4. Divisional Offices and Line Agency Staffs

Implementation will be the responsibility of the PWGs/WRMTs, with support from the DSs and GOSL. The activity will start in year 1, as soon as the project watersheds are identified and the WRMTs are formed and will continue through the life of the project.

4.3.3.5. NGO Strengthening

This effort will be the responsibility of the NWG and PWGs, working with selected NGOs. The strengthening will start during year 1 and will continue through the life of the project. By contracting with NGOs for studies, training and UG creation, their skills and commitment for participatory natural resources management are expected to increase. Because this is a purpose of the project, the terms and conditions for implementation should provide for this as well as achievement of the specific activity output.

4.3.3.6. Strengthening Private Sector and Banking Institutions

The NWG and PWGs will have primary responsibility for this, working in conjunction with selected business establishments and banks. Implementation will begin in year 2 and continue through the life of the project. The same provisos as under 4.3.3.5 will apply for this activity.

4.3.4. Improving Coordination and Linkage

In the pilot watersheds, the SCOR Project will take the leadership in bringing the activities (projects, programs etc.,) based on land and water resources into closer coordination. The Project will strengthen the capacity of the Provincial Administration and the Divisional Secretariats in integrated planning for the utilization of land and water resources in the watersheds. The institutionalization of such an approach will **shift the strategy of development of land and water resources from an uncoordinated "project mode" to a well coordinated "program mode."**

4.3.4.1. Multi-level planning

This will be the responsibility of the WRMTs, with support from the PWGs, in close cooperation with the UGs. Experimentation in the pilot watershed areas will start in year 2, extending through year 3, with broader implementation starting in year 4. Where UGs are in existence as under ISMP-assisted schemes, experimentation and technical assistance would begin in year 1 to build a better knowledge base for work in new areas with new groups. This activity has already been encouraged by the Irrigation Management Division, which would cooperate with its further elaboration and improvement. Precedents and procedures from irrigated areas, it is hoped, would give some guidance for working in non irrigated areas.

4.3.4.2. User Group Federations/Councils in Watersheds

The WRMTs will have primary responsibility for this activity, supported by the PWGs. Initial efforts on the first set of watersheds will begin about year 3 in an experimental mode. Extension to the second set of watersheds could start in year 4. Monitoring will continue for the life of the Project. This will be one of the most challenging aspects of SCOR, and even a 50-percent success would represent a significant accomplishment.

4.3.4.3. Administrative Mechanisms for Watersheds

The PWGs, in cooperation with the PCs and DSs, will have primary responsibility for this activity. Establishment of the WRMT will be the first step in the development of new mechanisms. This will start in year 1 and will be

supported by funding through the Project. Monitoring, evaluation and modification will continue through the life of the Project. If additional mechanisms besides the WRMT are needed, these will be introduced.

4.3.4.4. Provincial and Divisional Planning and Implementation

The NWG and PWGs will have responsibility for implementation of these activities, starting in year 1 and continuing for the life of the Project. What planning and implementation mechanisms with the staffs of Provincial Councils and with Divisional Secretariats will be most effective are not presently known. As this Project allows for experimentation, each of the PCs and DSs will be encouraged, with NWG and PWGs advice and assistance, to formulate what each thinks will be most effective for promoting better land and water resources use. The effectiveness of alternative modes of organization will be evaluated beginning in year 3.

4.3.4.5. Government Agencies and Donors

The NWG/PWGs will have the responsibility for this activity, with the PWGs focusing on the government agencies and projects that reach the watershed level, and the NWG addressing issues with donor agencies. Preliminary work will be done in year 1, particularly in relation to donor-assisted projects, with further implementation planned for year 2 through the end of the Project. The design team has contacted several government and donor agencies involved with projects in the natural resources area, most notably the Participatory Forestry Project (PFP) funded by ADB, which has complementary objectives focusing on the upper catchment areas of watersheds. Liaison with the Department of Forestry is already planned and both SCOR and PFP can benefit from coordination and linkage.

4.4 Major Project Inputs

It is anticipated that the Project will be implemented through a Cooperative Agreement, with the majority of the technical assistance being provided by the cooperator/contractor, with a limited number of subcontracts involving consultants for assistance in relation to resources tenure issues, and one or more NGOs in Sri Lanka to manage and provide assistance in the area of group formation, experimentation and institution strengthening. The assistance needed for the major Project components are:

4.4.1. Surveys, Analysis, and Applied Research

Resident and short-term technical assistance to conduct the baseline surveys, analyses and applied research (1a, 1b, 2a, 2b, 2d) will be provided by the cooperator/contractor and subcontractor/s, with the assistance of local research institutes

such as AR&TI or universities assistance. Where such local assistance is utilized, it will be through a subcontract.

4.4.2. Experimentation and Program Development

Resident and short-term TA, in cooperation with UGs, the NSC, and PSC, will experiment and implement project activities 1d, 1f, 1g, 1h, 1i, 2d, 2e, 3a, 4a, 4b. Participation of the NGOs will be through the subcontracts.

Experimentation with different types of group organization, with different forms of group economic activity, and with different approaches to natural resources information dissemination are anticipated. In addition, there will be experiments on ways to accelerate the land titling program utilizing the private sector.

A "guarantee" fund that can be drawn on by cooperating NGOs to support user group activities will be utilized to insure group loans on an experimental basis.

4.4.3. Capacity Building and Coordination

Resident technical assistance will be provided to the MLIMD to enhance capacity for ministry coordination of its natural resources management agencies, with special attention to the area of data collection, information processing and dissemination (2c, 3a, 3b, 4e). The PWGs will undertake similar capacity-building activities with provincial and divisional personnel (3c, 3d, 4d, 4d).

Resident and short-term TA will be provided by the cooperator/contractor to build capacities of the NGOs (3e) engaged in group formation (1d) and to those providing supporting services to economically active natural resources user groups (1h). Similar assistance will be rendered to private sector entities (3f) involved with strengthening user groups (1f-i).

4.4.4. Training and Education

Resident technical assistance will be provided to manage a program of training for the WRMTs and for others as necessary to implement the capacity building, coordination and policy dialogue components of the Project (2c, 3b-f, 4c-e). The training consultant will be responsible for:

a) developing the training programs in support of the Project purposes;

b) designing local short courses and identifying NGO or other local sources for short course implementation;

c) designing and managing local and international study tours associated with

resources tenure, watershed resources management and other relevant issues;

d) arranging for two longer-term MS level programs, relating to resources tenure and information systems.

Training activities with user groups and with trainers/organizers (1e, 4a, 4b) will be handled by one or more NGOs specially selected for this task, since this is more to their comparative advantage.

4.4.5. Policy Dialogue

Technical assistance will be provided by the cooperator/contractor, augmented by local assistance, to GOSL, NGO and the private sector in relation to policies affecting group formation, resources tenure arrangements, and natural resources management (1c, 2a, 2b, 2c, 3b). This will be coordinated with the NAREPP and other projects providing related technical assistance to avoid duplication and to optimize the use of available expertise. The cooperator/contractor will provide:

a) long-term resident technical assistance in natural resources utilization and management, with an emphasis on agricultural utilization, to assist the M/LIMD and the NSC in exploring policy changes that would further the implementation of a supportive incentive and institutional environment for more sustainable utilization of watershed resources; and

b) short-term resident and local TA relating to resources tenure issues and to group formation.

4.4.6. Implementation of Commodities

As specified in the Project budget, only limited project commodities are anticipated under the Project. The cooperator/contractor will be responsible for commodity procurement. It is not possible to detail the equipment at this time, since the equipment necessary will be dependent upon the watersheds selected for Project action, and upon the degree to which existing agency resources can be utilized. The most likely requirements will be for support of mobility within the pilot watershed areas (vehicles) and for support of information systems and communication (computer hardware software). An assessment of commodity needs will be made in the preparation of the first annual work plan.

4.4.7 Performance Disbursement Principles and Benchmarks

Two principles underlie performance disbursements:

a) Compensation for real financial costs of performance;

b) Compensation for political costs of performance.

This means that there will not necessarily be in all cases a direct correspondence between the government budgetary costs of carrying out activities and the level of the disbursement. There are three general categories of performance expected of the government under this Project:

a) Ground-level participation in project implementation;
b) Capacity-building at various governmental levels;
c) Reform of policy, process and institutions.

In Annex X, an analysis is presented of how these principles and these categories would be translated into a program of performance disbursement of Project funds, in support of Project implementation and the achievement of Project purposes. Such an analysis is too detailed to be included in full in this Project Paper. Benchmarks for assessing the progress of Project activities toward achieving their objectives are also proposed as a means for guiding and monitoring the implementation of this plan.

4.5. Time Line for Project Implementation

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Existing local organizations	STUD---					
Constraints analysis	STUD---					
Legal status of user groups	DIAL---IMPL----------					
User group creation strengthening	IMPL/EVAL----------					
Training user groups/trainers	IMPL----------EVAL/IMPL------					
Economic opportunities	IMPL/EXP/EVAL/IMPL----------					
Special opportunities	- - - - - EXP/EVAL/IMPL-----					
Supporting services/facilities	- - -IMPL/EXP/EVAL/IMPL----------					
Production companies	- - - - -EXP/EVAL/IMPL-----					
Regulatory/legal mechanisms	STUD---DIAL---IMPL----------					
Resources access/tenurial arrangements	STUD/DIAL/IMPL----------					
Policy/process reform	DIAL----------					
Land titling	- - - - EXP/STUD/EVAL/IMPL---					
Land consolidation	- - - - - EXP/EVAL----- IMPL-					
Information systems	- - - - - IMPL/EVAL----------					
National departments/agencies	DIAL--- IMPL----------					
Provincial Councils and staffs	- - - - - IMPL----------					
Divisional offices and staffs	IMPL----------					
NGO strengthening	IMPL----------					
Private sector/banks strengthening	DIAL--- IMPL----------					

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Local multi-level planning	- - - - - EXP/EVAL/IMPL----------					
User group federations	- - - - - EXP/EVAL/IMPL-----					
Administrative mechanisms in watershed	IMPL/EVAL----------					
Provincial/divisional coordination	IMPL----------EVAL/IMPL-------					
Government agencies/donor coordination	IMPL----------					

STUD = Studies
DIAL = Dialogue
EXP = Experimentation

EVAL = Evaluation
IMPL = Implementation
- - - Planning/Preparation

4.6. Monitoring Plan

Monitoring during the project will concentrate on performance at the interface between the UGs and the government sector, but will include the necessary oversight of Project activity at the other levels. The cooperator/contractor will be required to obtain the necessary data on each of the four Project components to report on the degree to which the indicators of progress have been satisfied. Reports will be provided that meet USAID and GOSL requirements.

Most of the data necessary for reporting will be obtained through a system of process documentation which will be an important mechanism for continuous learning from the field activities. This will be supplemented with information from the normal monitoring activities of MLIMD, MADR and other government agencies. The Project will strengthen a national research organization such as AR&TI to undertake monitoring and evaluation (M&E) of SCOR. The selected agency will be accountable to the Project for the activities.

The cooperator/contractor will design a special monitoring element to determine changes in the roles and benefits of women in the course of the Project.

4.7. Spread Effects and Institutionalization

Even though the SCOR Project will utilize a limited number of watersheds in its learning and development stages, it is anticipated that implementation will be on a much wider area. Toward this end, a significant spill over or "spread-effect" is expected as a **low-cost expansion** of the adoption of innovations tested and introduced by the SCOR Project. Two processes are relevant here:

a) autonomous expansion once the validity of the SCOR approach is demonstrated;
b) augmentation of spread-effect by a well-designed program/mechanism.

Both these will help internalize or institutionalize the SCOR approach. Moreover, the active involvement of the key actors relevant to land and water resources management, (namely users, government agencies, local government bodies, NGOs, and the private sector) at all stages of the project (design, implementation, M&E, etc.) will also lead to reactions consensus among them on activities and processes, and will guarantee a higher degree of sustainability. The autonomous and "planned" spread of SCOR approach to non-project areas should involve the replication of essential supporting services, as well as the utilization of appropriate practices and processes.

Expansion of some of the supporting services, such as provision of financial credit under group auspices can occur essentially autonomously in the private sector, once the validity of the approach is demonstrated. Other services, such as the provision of technical advice on environmental protection practices and feasibility advice on new economic ventures may more appropriately be provided by the nongovernmental and/or governmental sectors.

Sri Lanka is fortunate in having a strong NGO sector with proven ability to work with local people, especially the poor. As such, the sector is in demand to serve as a vehicle for project implementation, for many externally funded projects. While the Project design effort has made a preliminary assessment of the capacity and availability of NGOs in the provinces to assist in the implementation of the Project, it has not assessed the potential for this sector to expand the project activities to the wider area. To augment this effort, a special mechanism starting in the 3rd year of the Project will be launched. These will include field days, planning workshops, review and follow-up sessions, etc., for participants from representative watersheds which were not included in SCOR pilot areas. The Project will attempt to make this assessment during years 2 and 3, considering two basic models: **expansion** and **cloning**.

The expansion model implies that the NGO would expand its staff and resources to be able to undertake the necessary work on a larger scale. This model anticipates that it will be possible for the NGO to **mobilize**, and **manage** an **expanded human and financial resources operation**, and to apply it over a wider area. Almost always, this means professionalizing the NGO. There are examples in India where this has been successful; most focus on providing a limited range of services, and many are supported by external donor funds.

The clone model starts from the assumption that expansion of the NGO is inadvisable because of the difficulty of managing a larger activity, and from the fear that growth means distancing from the client group. Critical to the success of most NGOs is a high degree of leadership. The clone model assumes that this leadership can be found widely, an assumption that is not always valid.

With the exposure to SCOR practices and processes in pilot areas, these participants may introduce innovations in their respective watersheds. Planning workshops and review sessions may help them in these efforts. The project may also provide "catalysts" to augment the spread-effects in such areas and conduct M&E in selected sites.

CHAPTER 5: EVALUATION PLAN

5.1. Final Evaluation

The activities of the Project will be carried out across a number of levels with different starting and ending times. Therefore, it is difficult to specify in detail the elements of an evaluation plan a priori. For each of the activities, outputs and indicators have been specified, and the evaluation will determine the degree to which the anticipated outputs have been achieved. Since the individual activities are anticipated to be synergistic, it is logical to try to evaluate the project in a more holistic manner. The four integrating themes of the project provide a basis for this aspect of the evaluation, to go beyond the specific assessment of outputs and impacts.

The final evaluation should identify the degree to which there are **improvements in the incentive and institutional context in which natural resources-based economic activity takes place**. The baseline information that will have been collected at the start of the project will provide reference points for judging the degree and location of improvements in production environments of natural resources users. Of special interest in the evaluation will be the degree to which the resources users have increased their control of natural resources and the impact of increases in control on their production decisions affecting sustainability.

The evaluation should determine the **degree to which environmental considerations have been internalized in group and individual production decisions** as well as in the thinking of government, NGO and the private-sector actors. This will be more difficult, but it can be inferred from a study of resources-related decisions and practices. Project reports, and particularly the research and process documentation that will be carried out, should provide basic information needed for the evaluation.

The **enhancement of people's access to and understanding of information about natural resources potentials and problems** will be evaluated to determine the changes in the types of resources information entering accessible data bases, in the forms whereby information is made available to agencies and to groups at the local levels, and in the purposes for which that information is used.

The strengthening of the capacity of the Provincial/Divisional level authorities in planning for land and water resources utilization in an integrated manner, will be evaluated by taking an inventory of resources allocated to land and water resources management and determining the percentage of such resources channeled through the integrated plan.

In addition to the evaluation of the substantive achievements of the project, there will be the normal evaluations of the performance of the participants in the Cooperative Agreement, of the technical assistance personnel and cooperating government and nongovernmental bodies, and of the financial performance of the project.

5.2. Mid-Term Evaluation

The mid-term evaluation will be done in 1995, to determine the progress of activities and to identify significant findings that may suggest changes in the direction and/or emphasis of project components. This will be an important evaluation since it is scheduled to occur when most of the research and experimentation will have been completed and information will be available to chart the implementation phase of the project. The make-up of this evaluation team will be partly determined by the composition of the team handling the mid-term evaluation of NAREPP. The evaluation of SCOR should be complementary to that of NAREPP and could be carried out in conjunction with the scheduled 1995 evaluation of the parent project, with the addition of local and/or expatriate experts in the areas of resources tenure. Provision is made in the Project for this type of external consultancy.

5.3. Interim Evaluations

This Project has been designed in a participatory mode, with GOSL and user group inputs to the design from the very initial stages. It is conceived as a learning process project as well. So, annual reviews and reporting of progress will be needed to continue the participatory nature of the project, to enhance the dialogue, linkage and coordination efforts, and to involve user groups more fully with governmental, NGO and private-sector participants.

It will be desirable for these evaluations to be carried out "in situ" with national and provincial participants together with the representatives of user groups if existing in the evaluation, spending time at watershed level, and observing the progress and problems. As soon as federations of user groups are established at watershed level, evaluations should be conducted with them, giving user representatives an opportunity to formally participate in the process of evaluations.

The Provincial Steering Committees and National Steering Committee members will be involved in the evaluation process, and the annual progress/evaluation reports will be formally reviewed by the PSCs and NSC as well as by user federations. WRMTs will be given an opportunity to comment and make suggestions on these reports too, since participation is valid and valuable for administrative participants as well as for community and group-level actors.

5.4. Baseline Survey

The project will support the establishment of several "benchmarks" in respect of the status of resources and their uses, about user group activities, about the state and efficiency of operation of line agencies and the private-sector groups, degree of shared control of resources, level of livelihood of a cross section of users and, finally about the state of the environment. The subsequent progress and achievements realized by the Project will be assessed against the benchmarks hitherto established. It is suggested that the baseline survey is completed before the commencement of proper Project activities.

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Annex I

STATUTORY CHECKLISTS

LOGICAL FRAMEWORK (LOGFRAME)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
GOAL			
To increase the sustainable productivity of the land and water resources base in Sri Lanka	Production per unit of land and water increases Number of environmentally sound production practices increases Quality of land and water resources improves	Monitoring private investment in land, water and agriculture	Increased shared control of resources will create incentive and institutional environment for production and protection; aquisition, analysis and dissemination of information will create greater environmental awareness
SUB GOAL			
Resources users in the target area adopt more sustainable land and water management practices	Rates of soil erosion decreases Illegal use of forest, land and water resources decreases Protection of forest, land and water resources increases Resources users increase investments of labor and capital	Monitoring land and water use practices adopted by userss	If user groups are provided with adequate information and incentives, they will adopt more productive and better protective practices
PROJECT PURPOSE			
To expand and effectively implement within the pilot provinces of Sri Lanka the concept of shared control of land and water resources	Number of user groups in target areas has increased access and rights to utilize resources in upper catchment areas, tank/reservoir areas, command areas and drainage areas User group able to: inventorize economic potential of resources; develop and implement resources utilization plans; control illegal practices; promote sustainable practices within their memberships; and operate and maintain resources infrastructure Government entities, user groups and private agencies have increased access to improved information regarding land and water use in target areas.	Project records; M&E reports	User groups not having the manage rights to control resources is an obstacle to their effective managment Lack of willingness created by lack of incentives for user groups adversely affects the management of land and water resources
INPUTS	Budget (million US$)		
	USAID GOSL	USAID and GOSL records	GOSL counterpart funding
1. Technical assistance	$____ $____		
2. Training	____ ____		
3. Commodities, facilities	____ ____		
4. Research support	____ ____		
5. Evaluation and contingencies	____ ____		
7. Operational support	____ ____		
TOTAL	$____ $____		

OUTPUTS

1. Capabilities of User Groups Strengthened

1000 user groups, 100 user organizations, 15 sub-user councils and 4-6 watershed councils created/strengthened in pilot areas.

3000 representatives of user groups, 100 from user organizations and 20 from User Councils and Sub Councils receive formal training in such areas as group dynamics and leadership, resource use planning, sustainable practices, organizational and financial management and marketing.

40 selected users' organization representatives complete study Tours abroad.

30 different modes of existing and/or new commercial opportunities for user groups developed and/or supported.

10 Production companies representing different models for intensifying production in watersheds in sustainable and environmentally sound ways established on an experimental basis.

300 rural-based commercial activities and 10 production companies linked to new markets, and revolving funds and schemes for providing matching grants established to assist commercial activities.

100 user organizations within the pilot area are conferred with legal status and powers and a larger number outside, through spread mechanisms.

2. Resource Tenure made more secure for users

Policy, legal and regulatory changes enacted enabling increased control by users.

Land tenuring process accelerated.

Rationale for land consolidation demonstrated in 30 small tanks.

3. Government, NGO and Private sector capacities strengthened and better able to support users and user organization

Improved resources use information and monitoring system developed and resources user's operations monitored.

20 national, 50 provincial and 150 divisional level officials made aware of and trained in local level planning, providing assistance to user groups and coordination.

100 representatives from NGOs/private sector trained in participatory natural resources management.

NGOs and other private sector organizations providing technical, managerial and commercial information to user groups.

4 national, 6 provincial and 15 divisional level officials complete short study tours abroad.

4 provincial and 6 divisional level officials receive short-term training abroad.

4. Improved co-ordination and linkages among users and agencies.

Improved methodologies and tools developed and applied for multi-level planning.

Groups/organizations supporting and promoting planning and coordination in pilot watersheds.

Land and water use plans for pilot watersheds produced through participatory mode. (user groups, NGOs, Government and provincial staff, private sector staff and donors, if any)

Institutional mechanisms to coordinate and support land and water management practices made operational at provincial and national levels.

TECHNICAL ANALYSIS

This analysis seeks to determine whether the interventions relating to technical aspect dealt with in the Project Paper are appropriate. It evaluates the practicality and the probability of success of these technical interventions.

1. Summary of Rationale for the General Approach

The Project purpose is to **increase shared control of natural resources** through state-user partnership that contribute to intensified and sustainable agricultural production while conserving the physical biological and social environments. The activities planned cover a broad spectrum, but there are three integrating themes: to improve the incentive and institutional context in which natural-resources-based economic activities take place, to encourage the combination of productivity and sustainability; to foster the internalization of environmental considerations into decision making; to enhance governmental, group and individuals' information and understanding about environmental problems and potentials. In essence, the SCOR Project is aimed at introducing and institutionalizing participatory strategies to strike a proper balance between **production and protection** of land and water resources. The technical feasibility of the project as well as the economic and social soundness, and administrative feasibility were also evident during the participatory design process.

The focus on **watershed development** is a unique feature of the SCOR Project. The need for integrating the development efforts in the different components of watersheds -- namely, upper catchment areas, reservoirs and anicuts, command areas and highland, and irrigation return-flow areas downstream -- is a basic premise of the SCOR Project. The central arena for project implementation will be the Pilot watersheds selected from North Central and Southern Provinces. The interventions will be focused on formulating, pilot-testing and application of specific land and water rights, strengthening the technical and managerial capabilities of the resources users so that they are better able to assume greater responsibilities for natural resource management, assisting these users in structuring their agricultural activities for greater profitability, strengthening the capacities of local and intermediate level administrative and governmental bodies to interact positively with the resource users, and improving those aspects of national policy and ministerial structures necessary to implement the shared control of natural resources management.

2. Analysis of Integrating Themes

a) Improvements in the incentive and institutional context:

There is a growing consensus that in developing countries, agriculture, to be sustainable, must provide for an improved livelihood for an increasing population and protection of the natural resources base. The sponsorship of the U.S. National Academy of Sciences

Panel on Sustainable Agriculture in the Humid Tropics by both USAID and the US Environmental Protection Agency is testimony to this view.

There is evidence in many developing countries, including Sri Lanka, that farmers, even those with very small holdings make production responses to the economic environment within which they carry out their agricultural activities. These responses are influenced by the degree of control the farmers can exercise over their means of production, the availability of information about market conditions and opportunities, and the availability of necessary supporting services.

In Sri Lanka, even the modest increase in control over water achieved by the farmers in projects such as the Gal Oya Water Management Project, the Integrated Management of Irrigation Schemes (INMAS), and Irrigation Systems Management Project, (ISMP), through their group participation in the Project Management Committee has resulted in significant increases in agricultural production and greater efficiency in the use of the land and water resources.

That Sri Lankan farmers respond to economic incentives and disincentives is clear, as evidenced by the change in farmer cropping practice, in Mahaweli System H and certain other areas having comparative advantage from rice planting on inappropriate red-brown soils to the production of chili, when the Government policy of importing chili to maintain a low consumer price was modified to permit a greater profit by domestic producers. The shift to the more suitable other field crops (OFCs), has resulted in a much more efficient use of the valuable irrigation water, as well as an improved fertilizer efficiency. The latter has undoubtedly also resulted in substantially reduced leaching of nitrates to the groundwater, providing an important environmental benefit.

However, it is also clear that in many countries there are disincentives associated with a number of practices designed for environmental protection. In some cases the disincentives are economic while in others they are institutional. For example, when physical works such as terraces and protected waterways, or tree planting are required, the time necessary to recover the costs usually is too long for the resources user to bear. The customary way to reduce this economic disincentive is to pay some or all of the cost incurred in following this practice. In the U.S., conservation payments are made for a wide range of environmentally beneficial practices. Local communities make the decision on which practices will receive payments in their communities, reflecting local knowledge and priorities.

The institutional context is important from two aspects, (1) the impact on the ability to organize for group economic activity and (2) the availability of supporting services. Small landholders and other individual resources users experience significant difficulties when they attempt to expand and/or modify their economic activities. Even when they have reasonable security of tenure, they find it difficult to obtain adequate financing, to gain from economies of scale, and to benefit from available professional

services. Under such circumstances, organizing into groups with appropriate legal rights provides an effective mechanism for overcoming these difficulties. The experience in Sri Lanka indicates that although some groups have been able to overcome some of the credit and scale constraints even without appropriate legal rights, this result is much more difficult to achieve. The SCOR Project will build on past experience of group economic activities - notably of the water user groups in major irrigation schemes - and promote group efforts in water and land use in the watersheds.

b) Internalization of environmental considerations:

Some of the environmental problems generated in the rural sector are the result of the identifiable actions of a few individuals, for example, accelerated erosion resulting from inappropriate (often illegal) cutting of trees on fragile lands. These can be addressed through the customary procedures of setting environmental standards, monitoring and imposing penalties. This incorporates a measure of environmental consideration into the individual decision-making process -- the extent depending upon the effectiveness of the monitoring and the severity of the penalty. Local or **community control** of water and land resources in the watersheds should enhance the efficiency of monitoring and imposing penalties.

However, certain rural-based environmental problems are the result of the aggregation of the impacts of actions by many unidentifiable (non-separable) individuals. These problems, typically of a **non-point source** cannot be effectively dealt with using the point source control mechanisms. Experience in many countries, including developing countries, has shown that a combination of education on the problems and their sources, monitoring to provide input to the educational effort, reasonable options for individual actions, and peer pressure or other social incentives can lead to internalization of environmental considerations.

c) Information and understanding of natural resources environmental problems and potentials:

A prerequisite to any effective program of sustainable natural resources-based production is a strong foundation of information on the natural resources. This information must be available to the resources users, others in the private sector, as well as the government agencies involved in natural resources management. The information must be available at a scale appropriate to the intended use, and in a readily understandable form. The basic information must be adequate to reasonably define the environmental constraints.

To assist in the identification of potential opportunities, the information must encompass a wider range. Information on technology, infrastructure, water sources, population centers, marketing, etc., become important when attempting to discover new economic potentials.

Computer-based data handling systems are now available to quickly and efficiently manage spatially defined data, and to permit their combination according to different criteria. The resulting combinations can be displayed readily as maps, charts, tables, or other forms of dissemination. These Geographic Information Systems (GIS) are being adopted rapidly by planning agencies, private firms and others involved with natural resources management and utilization. In Sri Lanka, the Land Use Policy Planning Division with ADB support is developing a major land use GIS data base, which could, and probably should be the foundation for a much more inclusive data base.

3. Analysis of the Project Approach

a) Sequential:

The majority of the Project's activities will be carried out sequentially within a limited number of selected watersheds within the North Central Province (dry zone) and the Southern Province (wet zone). In each, the set of activities proceeds from the identification and analysis of the existing situation, to the generation of additional knowledge essential to continuing actions, to experimentation and then to wider-scale application. The type and extent of knowledge generation required will differ in the two provinces, and in the different components of the watersheds, since much more is known about natural resources utilization in the dry zone, and in the irrigated commands, than in the wet zone and the upper catchment and downstream irrigation return-flow areas. Thus, the activities will proceed at different speeds, and there will be an explicit emphasis on learning during the process of implementation of the individual activities, through **process documentation** and frequent **feedback** to the users, the professional staff and the steering committees. The sequence of activities and the implementation strategy are given in tabular form at the end of this analysis.

b) User-oriented/participatory:

As indicated in the table of project activities at the end of this analysis, the Project is designed to be user-oriented and participatory. This means that much of the emphasis and activity of the Project will be at the field level in the selected watershed. The approach will be to increase the **share of control of the natural resources of the watershed by the users and to support them as they attempt to intensify, expand or move into new economic activities. To achieve economies of scale, and to utilize group solidarity to promote responsible behavior, the Project is based upon group action as a primary vehicle for Project implementation.**

As constraints to group activities are identified, the Project will assist in the removal of the constraints. When the constraints are the result of policies, rules, regulations, or actions of a higher level, the Project will work at those levels to achieve the purposes of the Project. **Demand-driven changes** are likely to be more expeditiously addressed than recommendations for change from above. The Project structure,

including Steering Committees in each of the provinces and at the national level will facilitate the process of inducing change.

The Project's participatory mode, starting with the design process, in which officials, resources user group representative and others from the national, provincial, district and divisional levels played important roles, through to implementation should facilitate both the identification of problems and constraints and their solutions.

c) **Multi-level:**

While the Project will focus the majority of its activities at the local level, with the watershed as the basic unit, other activities will take place at the division, district, province and national levels. The specific activities at the intermediate levels will be determined in the process of dealing with the problems and constraints identified in the selected watershed. It is anticipated that these activities will be those that strengthen the ability of the government and NGO organizations to more adequately provide supporting services to the user groups, and to assist in the reorientation of the government agencies to a client-centered mode.

At the National level, the primary emphasis will be on strengthening capacity to deliver appropriate information on natural resources to the broad community that can benefit from that information. In addition, as explained in the text, and primarily based on the Projects action-research activity, certain policy and process reforms will be promoted at this level.

d) **Watershed-based:**

The rationale for using the watershed as the basic unit for integrated planning of resources utilization is clear. The watershed is a physical entity geographically defined by an important natural resource, water; the ways in which the water in the upper parts of the watershed are used affect the ways in which it can be used downstream, and they affect the associated land resource. Thus, the various parts of the watershed are physically and operationally linked in important ways, and the potential benefits from integrated use can be large. However, two aspects of the human ecology in the watershed influence the relevance of the physical ecology. First, the people in the different components of the watershed having access to different aspects of the natural resources base, are frequently engaged in different economic activities, and may be of different social and/or cultural backgrounds. People in the upper catchment areas have very different environmental, economic and social conditions from those in associated irrigated commands and those in downstream areas of the irrigated areas. Thus, the personal and economic interests in the different areas do not necessarily coincide, introducing problems for planning and implementation.

Second, the physical boundaries of the watershed are rarely congruent with the boundaries of the constituent political entities. While some political boundaries may be demarcated by ridge lines, many follow streams and rivers, thus splitting the watersheds. This situation complicates the processes of planning and implementation.

The Project will attempt to overcome these problems of human ecology, to take advantage of the benefits to be gained from a physical ecology approach. The Project recognizes that **there are very few examples where this has been successful**, beyond the apportioning of the water resource. The Project emphasizes an integrated participatory approach, and will make a substantial investment in linkage and coordination. Experience in the major irrigated commands, in Sri Lanka, has shown that the combination of the use of catalysts, sharing of information, and reasonable administrative and political support can bring divergent groups into successful cooperative activity. While the process will be more difficult in the context of the full watershed, **there is a reasonable probability of success, and the potential for major benefit.**

e) **Inter-project coordinated:**

There are over 50 externally supported projects that relate in some way to the goal and purpose of the SCOR Project. Of these, three are directly relevant to the Project which has been designed to be complementary and synergistic to these. The most important of the three is NAREPP, whose training emphasis in environmental impact assessment, general education efforts, and emphasis on work in coastal areas, and with fish and wildlife have helped to narrow and refine this Project. Similarly, the ADB-supported GIS component of LUPPD provides the SCOR Project the opportunity to make significant advances in the governments' ability to deliver appropriate information to an important range of potential users. Discussions with LUPPD during the process of Project design have shaped the nature of interaction with the LUPPD Project.

The proposed ADB-supported Participatory Forestry Project, with its emphasis on the upper catchment areas provides an opportunity to enhance the abilities of both projects. The Participatory Forestry Project can benefit from the experience and the expertise in participatory techniques to be mobilized in the SCOR Project, while the latter can benefit from the incentives and other resources anticipated to be available to watershed residents.

While interaction with these three projects is strongly indicated, the SCOR Project will take the leadership in bringing the wider groups related projects and programs into closer communication and informal coordination. Institutionalization of such an approach will shift the strategy of development of land and water resources from an uncoordinated **"project mode to a program mode."**

4. Design Process

The participatory design process provides the most important evidence on the technical feasibility (as well as economic, social and administrative feasibility) of the SCOR Project. A cross section of "stakeholders" of land and water use, covering national, provincial, divisional and user levels actively participated in the design process. Among other things the design process has resulted in the following:

a) Senior policymakers of the key ministries have "accepted" and commended the project concepts, and strategies.

b) User interests have been incorporated and the project ideas discussed with a large sample of user groups in the two provinces selected for project implementation. Hence, one may conveniently assume a high degree of participation, resulting in an increase in **shared control**.

c) The fact that stakeholders had participated in the project design will give them the feeling that the project belongs to them. Hence, a high degree of "implementability" may be expected.

d) Last, but not least, the constraints as well as the potential (both technical and otherwise) were analyzed using a participatory approach, involving users, government officials at various levels, and representatives from the private sector. Hence, the activities and approaches proposed in the SCOR Project should be much closer to the ideal solution resulting in technical feasibility. (A recent reference in Parliament to the development of kitul-based production, given in **Attachment I to this Annex**, gives further confirmation of the prospects of profitable non-wood forest production through user involvement.)

The design process is briefly explained below.

The Government of Sri Lanka and USAID had discussions on the need for donor assistance in the more effective management of natural resources of Sri Lanka, particularly land and water resources, in irrigated as well as in non irrigated areas. A team of USAID consultants visited Sri Lanka in January this year to conduct a Project Identification Study. Among the main areas identified were: (a) institutional changes within the MLI&MD, (b) improvement to local level organizations, and (c) expansion of analytical capabilities and the knowledge base.

Following discussion with the Government of Sri Lanka and USAID officials, IIMI/SLFO was invited to present proposals to assist in the development of a project with the working title "Rights to Resources." It is particularly significant that USAID had agreed that the proposed project be designed by IIMI/SLFO in close collaboration with the Government of Sri Lanka on the basis of a systematic consultative process with all relevant officials of government, nongovernment agencies and users involved in the management of land and water resources.

Following the agreement with USAID and the Government of Sri Lanka, IIMI/SLFO set up a 4-member team to initiate the work of facilitating the design process in May 1991. IIMI also commissioned the services of three expatriate consultants from the University of Cornell and the Land Tenure Center, Wisconsin University. The Secretary MLIMD nominated a Core Team of senior officials to spearhead the participatory design process.

Consultations were held with senior officials of national-level agencies, non government agencies concerned with the management of land and water resources, and with provincial/divisional/field-level officials and also with user groups to obtain inputs into the design process. The IIMI Core Design Team joined by the three international resources consultants worked together in formulating the Project paper. The first meeting was held on 11 June 1992 at which the Group was able to discuss matters intended to be addressed through the Project and the possible goals, objectives, proposals and themes and the activities of the would-be Project. These tentative proposals were prepared by the Core Team on the basis of literature reviews and past experiences. Following this meeting several other Core Group meetings were held at which the final design was developed in stages with the active participation of the members of the Core Group. A decision was made that the resources of the Project would not be thinly spread but would concentrate on two pilot areas which represent a sample of the issue areas to be tackled. Accordingly, the North Central Province and the Southern Province were selected.

A field trip to the North Central Province was organized for 24 - 27 June 1992. During this consultations were conducted with several user groups and officials ending with a Workshop for Provincial/Divisional officers at Habarana on 25/26 June 1992. Similarly, a field trip to the Southern Province was also organized. Consultations were conducted with the user groups and officials ending with a workshop for provincial level officials at Koggala on 10/11 July 1992. The information and knowledge gathered from these field trips provided inputs to the design process.

Following the North Central Province field trip and the workshop, a national-level workshop was organized in Negombo on 3/4 July 1992. At the workshop, the Project goals, themes and activity areas presented by the design team were intensely reviewed by Small Groups and at plenary sessions. At subsequent meetings of the Core Group the revised draft was further modified and presented at the final national level workshop held at the Airport Garden Hotel, Seeduwa on 7-8 August 1992.

The Project proposals were further reviewed during meetings with the USAID and also with the Core Group. Following these reviews a second field trip to the NCP and SP were made from 31st August 1992 to 4th September 1992. The final draft incorporates the modifications made consequent upon the reviews and field studies.

Tentative Activity Schedule indicating "who will do what and when."

Activity	When (Starting date)	Who	How
1. Mobilization (set up PWG & PSC; national level organization? recruitment of staff)	First quarter in Yr. 1	Project coordinator	Discussions /contacts
2. Selection of watershed after study of maps, photos, reports, discussions with officials, etc. criteria - sub-watershed that has the 4 components of Catchement Command Reservoir and Drainage	First quarter in Yr. 1	Full-time project staff	Discussions/meetings/dialogues/field visits/PA
3. Assessment of conditions in watersheds; Land & Water use patterns; existing user groups/ organizations; existing resources that can be used. Potential for new modes of production	Mon 5-7 in Yr. 1	Staff project cordinator PWG & other agencies	PA and survey techniques. Constructions with agency staff
4. Recruitment of catalysts	Month 2-6 in Yr. 1	Committee from PWG. and nucleus WRMT	Paper advertisement interviews
5. Pre-service training of catalysts	Month 6-7 in Yr. 1	Full-time staff	Formal classroom training; on-the-job training
6. Baseline survey begins	First quarter in Yr. 1	Sub-contract to AR&TI	Survey
Report preparation and submission	Last quarter in Yr. 1	Sub-contract to AR&TI	Survey
7.Strengthening user groups/ organizations study, assess their status	Last quarter	Catalyst	Participatory

Helping them to register begins	Month 9 onwards in Yr. 1	Catalysts/ contract to NGO/agency staff	Discussions/visits/ meetings
Awareness building program for officers/NGOs re. user groups/organizations	Month 7 onwards in Yr. 1	Catalysts/ project staff	Workshops /meetings
Identify with groups/ organization economic opportunities	Month 5 onwards in Yr. 1	Catalysts/ project staff + NGO	Working with groups
Help groups/ organizations to pursue economic/commercial activities. Provide incentives like seed funds, etc.	Month 8 onwards in Yr. 1	Catalysts and sub-contract to NGO + catalysts	Catalyzing and working together
Develop marketing links (linking with the private sector)	Month 8 in Yr.1	Catalysts /project staff + NGO	Workshops + Working with groups
Training URs in leadership development, group dynamics Environment financial management economic enterprises	Month 8 in Yr. 1 Month 8 in Yr. 1	Catalysts/full -time staff through NAREPP }Project staff }together with NGO	Training workshops
Organize dialogues/ workshops with users and government staff	Month 8 onwards	WRMT	Meetings /Workshops
Encourage flow of information from DAS/PC to user groups/ organizations and other agencies	Month 8 in Yr. 1	WRMT PWG	Through workshops or IEC materials
User groups/ organizations encouraged to undertake supporting services	Month 9 onwards in Yr. 1 to Month 6 in Yr. 2	Catalysts + project WRMT	Catalyzing and working with groups

8. User Group/ Organizations Creation			
Study potential areas/subjects around which user groups could be created	Month 9 in Year 1	Catalysts /agency staff/full-time project staff	Participatory appraisal /surveys
Creation of resource user groups/ organizations	Month 5 in Yr. 2	Sub-contracted to potential NGOs.	Catalytic
User councils established	Yr. 4	UGs, WRMTs, Project catalysts	Catalyzing process; workshops
9. Economic/Commercial opportunities			
Study potentials	Month 9 onwards	Project staff + WRMTS + Catalysts	PA
Identify ones to be supported immediately	Month 9 in Yr. 1	- do -	PA
Incentives	Month 3 in Yr. 1	- do -	- do -
Regulations/reforms in supporting them (e.g., new regulations empowering registered UGs, exercise/policy departments awareness and training	Month 10 in Yr. 1	Project staff + PWGs + agency staff	Meetings /workshops /discussions
Enabling legislation/review potential opportunities Tapping/processing kitul-based products, cash crop cultivation under properties	Yr. 5	NGO/NWG/ PWG/limited project staff	Catalyzing process meetings/wor kshops

Agro-processing			
10. New Economic commercial ventures on pilot basis)			
- Supplementary irrigation in wet zone in dry spells in selected pilot areas			
- Conjunctive use of groundwater for irrigation in dry zone			
- Encourage diversified cropping in abandoned rice fields			
- moisture/nutrients conservation farming on high lands			
- land consolidation (demonstrations)			
- production company			
- Protection of risks to people's investments			
11. Preparation of a land and water use plan for watershed	Month 6-8 in Yr. 2	WRMT/Catalyst/project professions/line agency staff, NGOs	Based on existing plans and studies prepare an area specific plan
Assist user groups in implementation of the plan	Month 9 onwards in Yr. 2	Sub-contracted to NGOs.	Link with the private sector for delivery of services and information
- Training	Month 9 Yr. 2	NGO	
- Catalyzing	Month 9 Yr. 2	NGO/	
- Develop links with banks	Month 9 Yr. 2	NGO	

- Policies (water allocation/upstream control by users and process reform (.../re-design norms on reservation areas)	Yr. 3	Project staff/PWG/WRMT	
-- Policy dialogues study, revision	Yr. 3-6	NWG/PWG /limited inputs from pro. staff	Workshops /consultations
-- Policy formulation	Yr. 5	- do -	- do -
-- Policy approval	Yr. 5	NWG/PWG	Workshop/consult.
- Initiate land consolidation under 30 small tanks	Yr. 2	NGO/DAS	Participants
- Demonstration of consolidation and spread effects	Yr. 4 - 6	WRMTs/PWG	Spread effects
- Legislation/revision e.g., watershed Act	Yr. 6	NWG/PWG	-do -
- Access to information (better practices; technology; benefits/costs)	Yr. 2	PWG/WRMTs/Project staff/NGOs/ private firms	Establish information offices; tours, workshops, field days.
12. Institutionalization and spread effects - field days, training, workshops, production and dissemination of IEC materials	Yr. 3-6	Project	- do -
- Review and synthesis of process (assessment)			

Activity	When	Who	How
M&E indicators	Year 1	ARTI/WRMTs	PA; field visits; dialogue
Undertake continuous M	Year 1 onwards	ARTI/ project staff	Through participa-tory approach by project and agencies
Develop self-monitoring strategies for NG	Year 2 onwards	WRMTS/ project staff ARTI	Discus-sions and dialogue
UG undertaking self-	Year 2 onwards	UGs/ catalyst	Participa-tory
monitoring reports and their spread	Year 1 onwards	UGs/ catalyst	Paticipa-tory
Interim evaluation carried out	Year 3	ARTI/ NAREPP	Through evaluation
Revision of plan based on interim evaluation	Mid Year 3	PWG/ project staff/ ARTI/ catalyst	Workshops
Mid-term evaluation	Year 4	ARTI/ NAREPP	Appropriate techniques
Final evaluation	Year 6	USAID	Participa-tory
Study tours for UGs (pilot and other areas) Officials (pilot and other areas) NGO (pilot/other areas) Users (other areas) to get them familiarized with new developments and to initiate spread effects.	Year 2 onwards	PWGs/ WRMTS/ NGOs/ project staff	

Activity	When	Who	How
Environmental groups			
Strengthening awareness competitions discussions information	Year 2 onwards	Project staff/NGOs WRMTS	Conduct campaigns; grants to NGOs Promote link with agencies and NGOs
Linking with NGOs	Year 2 onwards	En. Groups + Project Staff + catalyst	Organize meetings; catalyzing
Creation	Year 3 onwards	Sub-contract to NGOs	Grants to NGOs
Tenuring process			
Study present status of granting titles and identify constraints	Year 2	Sub-contract to a local research organization	Research
Study impact of tenure on productivity and sustainability of resources base: Permit lands Swarnabhoomi Land private land and state land including encroachments	Year 2	Contract to a local research organization	Research
Synthesis of findings	Year 3	Project Staff + NWGs + PWG	Workshop
Pilot experiment on granting titles and impact assessment	Year 4-6	Project Staff + NWGs + PWG + UG	
Review of results	Mid-Year	NWG/PWG/Project Staff	Workshop
Policy/process reforms	Year 6	NWG/PWG	Workshops/ discussions
Legislation	Year 6	NWG/PWG	Workshops
Institutionalization and spread effects	Year 6	NWG/PWG/NGO	Meetings; workshops; catalyzing
Institutionalization/ spread effects (tours, field days)	Year 6 onwards	NWG/PWG/WRMTs/NGOs	Meeting; field-days, etc.,
Help UGs develop links with private and agency staff	Year 3 onwards	PWG/Project staff/ NGOs/WRMTs	Catalyzing

UGs employing technical specialists	Year 5 onwards	WRMTs/UG Councils	Assisted by Project staff + catalyst
Revision/new legislation and/or process reforms	Year 5	NWG/PWG/Project staff/WRMTS	Workshops; meetings; discussions

Parliament — Friday

Kitul promoted

Sarath Ranawaka (UNP-Kalutara district) moving a private member's motion for the establishment of a Kitul Development Board said our colonial masters "banned" the kitul tree. They didn't want jaggery made as their intention was to bring sugar from abroad.

The MP added that the kitul tree was a very useful tree. There was nothing to waste in that tree. It was said in the villages the kitul tree grew even on a stone.

This tree did not suck in soil nutrients as some other trees. The cultivation of 'kitul' has been expanded in Malaysia.

Ease congestion

Anil Moonesinghe (SLFP-Kalutara district) said he was happy everybody had endorsed his motion. In some line rooms two to three families lived together. They could not look inside because there was no room as all had to sleep. They build a small shed and use that as a kitchen as a result. They must be given land where available so that this 'congestion' can be eased.

Kitul a blessing

P. D. Abeyratne (UNP-Kalutara district) said that kitul palms were never properly utilised. Kitul flour was nutritious, and toddy has always been a favourite.

The rich could afford expensive liquor, but the poor had to settle for humble toddy. To increase the production of toddy, small toddy shops could be opened.

Kitul timber could be used to make furniture. In fact, kitul was a blessing for a poor country, for it definitely had its uses.

Collecting centres for Kitul products

Hemakumara Nanayakkara (SLFP-Galle district) said that in certain kitul growing areas, many diseases have spread of late. It was difficult to find toddy tappers. Art of tapping should be taught, using modern equipment.

There were milk collection centres for Nestle. Following this example, centres could be set up for kitul based products. Toddy also could be sold at these centres.

Toddy, kitul 'hakuru' kitul flour etc; do not have a standard price. With the increase of production, new markets for the products should also be found.

Kitul for long life

Indradasa Hettiarachchi (Minister of Coconut Based Industries) said encouraging kitul cultivation would help the poverty alleviation programme of the government. Kitul was very nutritious.

The police should be kept away from the kitul industry. All countries were today paying attention to natural products. He said coconut oil was not injuries to health. People created myths about coconut oil to further their own interests. The same thing happened to the kitul palm. Kitul treacle and curd was very good for health and long life.

Educate people

R. D. Sirisena (UNP-National List) said about 500 families were involved in kitul cultivation in Derandiyagala.

The MP regretted there was no planned re-planting of kitul. People should be educated on planned kitul cultivation. Production of quality kitul jaggery and treacle was essential. An insurance scheme was needed for kitul cultivators. Kitul was the staple food of elephants also. More kitul palms should be planted.

Rich in Vitamin B

S. M. Jayaratne (SLFP-Kandy district) said that kitul growing has increased. Due consideration was not given to it. During King Dutugemunu's era, toddy was given to soldiers, and also to elephants.

Toddy was a traditional liquor, enriched with vitamin B. Palmyrah industry was protected and secured. The same interest should be taken in kitul cultivation also. Establishing a Kitul Development Board would be a good start.

Will be implemented soon

M. L. M. Aboosally (Minister of Plantation Services) said Kitul was being grown in many countries such as India, Sri Lanka, Burma and Indonesia. He thanked Mr. Sarath Ranawaka for bringing up the motion. He said that there were around one million kitul trees in Sri Lanka. But only 150,000 trees were being tapped. He said surveys had been done as far back as in 1975. There was potential for large revenue in the development of the kitul industry. The Palmyrah Development Board was now looking into the kitul industry. He said a separate board for kitul development would be set up. Feasibility studies were being done in this connection. He said nearly 80,000 people were directly involved in the kitul industry.

This tree should be utilised to the maximum. The government would soon implement Mr. Ranawaka's motion.

Source : THE ISLAND Monday 10th August, 1992

ECONOMIC ANALYSIS

This Annex focuses on the assessment and evaluation of **selected benefits**, evaluation of selected costs and finally carrying out the economic analysis by comparing benefits with costs. In the **strict sense**, this is not a complete economic analysis for various reasons. For example, the analysis does not quantify the transfer of benefits and costs such as some of the benefits captured by farmers which are at present enjoyed by the intermediaries. One classic example is the fertilizer trade where the organized farmers have captured much of the unjustifiable profits now going to traders. Additionally, a large number of benefits accrued to the Project are intangible which therefore cannot be evaluated correctly. Examples are the downstream benefits such as impact on natural resources management resulting from the group action of users in the upstream areas. It should be noted, however, that almost all the Project costs are direct ones and are included in the cost estimates whereas on the benefits side, only a few selected tangible benefit streams are considered.

In the first section, benefits are assessed and classified into two categories: direct and indirect. Benefits which are intangible are also classified under the "indirect" category in this section. **This is done in respect of each selected project activity.** The second section evaluates some of the potential benefits accrued to the Project. The final section compares some selected benefits and costs accrued to the Project and conducts the evaluation of the SCOR Project. This section also presents the analysis for "no project" situation.[1] The main measures used are benefit-cost ratio and the Internal Rate of Return (IRR).

It is customary that when ex-ante evaluations are conducted the computations of benefits and costs depend on assumptions about the area that could be irrigated or cultivated, crop yields that can be obtained when the project is in place, value added due to reduced erosion or improved quality of run-off/drainage, and above all, extent to which benefits are expected to correlate with a particular projects' inputs and so forth. Hence, despite the fact that benefit-cost analysis has some merit in comparing and contrasting the inputs and outputs, the general application of this technique is characterized by several defficiencies. These include the following:

i. Ambiguous evaluations of benefit and costs, such as those derived from making assumptions about perfect markets or from confusion between "with-project" and "without-project" yields, prices, etc.,
ii. Debatable choice of discount rates, and
iii. Difficulty in the separation of project and non-project effects such as the influence of weather, complexity of externalities and linkage effects.

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[1]Here we have included the production costs and benefits of existing crop production systems in the command and highlands. This is not usually practiced in the B/C analysis of agricultural projects. However, this was requested by USAID.

Ex-ante economic analysis of projects like SCOR is far from straightforward. Even the financial cost-benefit analysis, which ignores shadow pricing, externalities and other indirect and intangible costs and benefits, cannot be used in such projects because the value of most of the benefits is essentially unknowable. Improving user rights and participation in the control and management of natural resources is different from supplying them with irrigation infrastructure, inputs, etc; hence the link between project inputs and results is more tenuous.

Much of the SCOR Project will be devoted to experimentation replication, enhancing spread effects and institutionalization, none of which lend themselves to ex-ante economic analysis. Even the number of years over which Project benefits are expected to accrue cannot be specified in the absence of concrete knowledge about what sorts of interventions the Project will have.

It should be highlighted that a project such as SCOR which would concentrate on management changes will have far-reaching benefits compared to the projects with direct tree planting or soil improvement practices. The several manifold benefits attributable to SCOR could be due to; a) establishment of institutional mechanisms for land and water resources management which would continue the management process beyond the life span of the project; b) strengthening user groups and improvement of their capacity to undertake sustainable land and water management practices that will continue to provide benefits beyond the life span of the project; and c) spread effects which are augmented by specific mechanisms built into the SCOR Project. All these would help institutionalize the project approaches which, in turn, will lead to **sustainable management** of land and water resources.

Experiences of most of the tree planting projects in Sri Lanka show that government agencies have failed to protect fully the reforested areas after those projects due mainly to lack of cooperation by the "users." Hence, a project aimed at the **introduction and institutionalization** of **participatory processes** to achieve a proper balance between **production and protection** should yield much higher socioeconomic and financial benefits. Most of these benefits, however, cannot be evaluated adequately using the conventional tools of economic analysis. Hence, the "economic analysis" in Section 3 may be considered as a partial analysis which would "**underestimate**" the total benefits of the SCOR Project. To compensate for this a qualitative assessment of project's benefit streams is attempted in the next section.

1 Assessment of Project Benefits

A series of project benefits are identified in respect of some of the selected activities. Other activities will lead to the production of some immediate outputs which are a prerequisite for the attainment of what may be called "intermediate benefits" which would finally lead to the achievement of the project goal. The benefits are identified as direct and/or indirect. The latter category includes those benefits which cannot be measured directly and the intermediate benefits referred to above.

ACTIVITY AREA	NATURE OF BENEFIT	DIRECT/INDIRECT*
1.1 Assessment of the present situation		
Assess the present levels of land and water use patterns in different components capacities of relevant institutions and organizations	This by itself will not produce any benefits; but it is a prerequisite for all future development plans/work of the watershed and	Indirect
1.2 Constraint analyses		
Identify constraints to optimum utilization of land, water and other resources while protecting the environment	This will also not produce any direct benefits. But the results of the analysis will be a pre-condition for the design of a development plan for the watershed	Indirect
1.3 Watershed user groups		
a. Strengthening existing user groups through:		
Enhancing capacity and providing legal support	This is a precondition for the efficient and sustainable user groups and will lead to:	
	-improved O&M of irrigation systems	Indirect
	-enhanced sustainability of systems	Indirect
	-new investments on land & water resources	Indirect
	-business activities improved and income expanded	Indirect
	-protected environment	Indirect
	-reduced costs	Indirect
	-no. of trees planted and cared for increased	Direct
Establish coordination and linkages	For, example establishment of coordination and linkage mechanismss are the key to innovative business activities and improved marketing. They will finally lead to improved production, profits and better livelihoods.	Indirect
Support the formation of watershed-based user group councils	Establishment of councils among different user groups will enhance their bargaining power and improve stability. This will eventually lead to sustainable user groups.	Indirect

*Intermediate benefits are also included here.

b. Support user group creation where absent:

Creation of user groups	-benefit stream is similar to above	Indirect/ Direct

1.4 Design and implementation of a watershed development plan through participatory mode

a. Planning and implementation

Identify watershed	-no direct benefits	
Design and implement new economic opportunities	-more employment -increased income -increased livelihood	Direct Direct Indirect
Land titling program	-incentive for enhanced investment in land and water resources -increased income	 Direct
Improving tenure	-increased agricultural production -increased in the no. of trees planted and environment protected	Indirect/ Direct
Dissemination of information	-This by itself will not have benefits But encouraging the application of knowledge will lead to several other benefits including production and protection	Indirect

b. Pilot project/Action research/Experimentation

Experiment with land consolidation	The benefits accrued to experimentation are initially confined to the experimental area. However, through the internalization of tested innovations and by designing spread mechanisms, spill-over effects are expected. These effects may finally lead to increased yield, expanded production through better use of inputs, lowered production cost due to economies of scale, etc.	Direct /Indirect
Experiments with innovative economic opportunities, e.g., non-traditional irrigation opportunities in dry zone irrigation and in uplands in the wet zone through participatory group efforts.	-sustainable and increased income (farming methods, agro-processing, fuel types, irrigation methods) -more employment opportunities created -frustration of rural people reduced	Indirect
Experiment with new production modes, e.g., various types of production companies.	-lowered production costs (economies of scale) -increased income (production/ sale/value added) -increased employment	Direct Direct Direct

1.5 Institutions and policy reform for watershed development
(These will only be based on previous experimentation)

Policy dialogues and process reform	-change of staff attitudes concerning user groups	Direct
	-production/income increased due to better policy atmosphere	Direct
Establish information systems & improve dissemination	-increased production	Direct
	-increased profitability	
	-protected environment through tree planting & pollution control	Indirect
Capacity building of Agency staff	-staff attitudes changed	Direct
	-work efficiency improved	Direct
Capacity building of user group	This is a pre-condition for strengthening user groups and creation of groups where they do not exist	Indirect
Capacity building of State and private Agencies	This will lead to improved provision of supporting services including better coordination involving user groups	Indirect

1.6 Internalization and spread mechanisms

Continuity and sustainability of benefit streams cited above.	These activities will help internalize efforts introduced by the project and assist expanding innovation to non-project areas, facilitate new "green investments" and thereby enhance benefits. Hence, it is a pre-requisite for internalization of project processes beyond its life span.	Direct

2 Evaluation of Benefits

Evaluation of the benefits that may be derived from project activities listed above is attempted in this section. It should be noted that in evaluating costs and benefits, **cost to the user, specially the production cost of the benefits specifically accrued to the SCOR Project has not been taken into account** because the analysis considers the net return. It must be noted that some benefits can be directly measured and assigned a value while others cannot be quantified at this stage with sufficient accuracy.

For the purpose of this calculation, it is assumed that the average area of a watershed will be about 10,000 hectares, out of which the catchment area will be about 1,500 hectares and the command and drainage area about 5,000 hectares. The rest of the area of 3,500 hectares will comprise household gardens and the highland areas.

For the purpose of evaluation, the Project benefits are grouped into eleven main categories. The evaluation of benefits under these categories is shown below.

Benefit area 1: Decreased government expenditure on natural resources systems

One of the main benefits of the Project is to reduce government expenses on the management of the natural resources such as land and water. Another main objective is to encourage increased investments on the resources management by the private sector preferably through

farmers' organizations. There is evidence from several major irrigation schemes that user groups are able to take over the management of those systems. Since they are managing the systems the expenditure which the government has had to incur on their operation and maintenance has come down. [2] In the meantime, evidence suggests that the quality of work undertaken by these groups is much superior when compared to that of the work undertaken by contractors. The latter is the conventional method of undertaking O&M in major irrigation systems. Examples of user groups managing other resources such as forests in Sri Lanka are also found which however, have not been diocumented well. This transfer of management means improved sustenance of the natural resources systems.

The typical O&M costs of major irrigation system is in the region of Rs.385 per hectare per annum (Ariyaratne quoted in IMPSA 1991). The breakdown of this expenditure shows that material cost is about Rs.37 and labor costs are about Rs.185. The indirect costs such as employes salary, departmental overheads, vehicle cost, etc. is about Rs.163. These costs have to be incurred even when users carry out O&M. Therefore, the cost which can be saved on the part of the government due to user groups undertaking O&M is about Rs. 163 per hectare per annum.

The above experiences have already been registered in respect of major schemes in the dry zone. Similar experiences of participatory management of forestry resources have been conducted but the results not documented adequately. However, one study by Bandarathilaka (1992) suggests a strong case where the user groups have exercised management of part of Sinharaja satisfactorily when the user groups were given this responsibility. The initial findings are that the user groups have taken a keen interest in the management of forest resources. Hence, it may be expoected that the government's direct expenses on planting and protection of the forest resources can be reduced. The other sources of government expenditure reduction that can be expected from SCOR are the issue of permits for resources management, dispute settlement, land surveying, etc., where private investment is expected to increase. The present project will help demonstrate such experiences and the impact can be significant. This aspect is not included in the economic analysis although the benefits are likely to be substantial.

Benefit area 2: Improved protection of the environment

Improved protection of the environment is brought about by planting trees with their after care as a group, developing environmental consciousness and awareness among the resources users and assisting authorities in protecting forests in the catchment areas, in particular by providing

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[2] For instance, the present departmental allocations for operation and maintenance of the PSS in Polonnaruwa are Rs.161,039 and Rs. 590,354 respectively. This is 50 percent less than what it was before the formation of distributary channel organizations. With DCOs undertaking the O&M work, each farmer carries out O&M tasks in respect of his channel area. In the case of common channels, the task is accomplished through group work mainly in the form of Shramadana (Source: records of the Project Manager, PSS).

information on timber-felling activities. These activities themselves help conserve the environment and improve environmental quality. There is evidence that all these activities are taking place in several areas of the country.[3] The actual impact of these activities on the protection of the environment is difficult to quantify due to the intangible nature of the benefits except in the case of tree planting. In the latter case, taking the value of timber produced alone, it is noted that the present value of a good timber species planted 25 years ago is Rs.10,000 (personal communication with Forest Department 1992). This is in addition to several other non-quantifiable benefits which could be generalized from this area such as providing fodder, erosion controlling, providing of fuelwood, decreasing the speed of wind and reducing desiccation effect, providing of shelter belts, etc.

For the purpose of economic analysis, activities such as the introduction of agroforestry practices and other activities such as tapping kitul palm, bee keeping, cultivation of medicinal plants and other trees such as reeds, bamboo, etc., are included. The breakdown of major benefits which could be generated in one watershed area of hypothetical size of 10,000 hectares where different activities will be undertaken is as follows:

Category	Extent (ha)	Proposed use
Catchment	1,000	- Trees for timber
Catchment	500	- Medicinal plants, kitul tapping, bee keeping, goat rearing, etc. while maintaining evironment protection interests.
Highlands	3,500	- Intensive irrigation and agroforestry
Command + } drainage }	5,000	- Rice and high-valued crops with new irrigation practices

It is assumed that trees will be planted by user groups in 1,000 hectares of the catchment area (timber trees) at a density of 50 trees per hectare. In the area where goat rearing,

[3] For instance, in Deniyaya area, environmental protection groups have been set up by the resources users themselves, especially the youth. They have conducted environmental protection campaigns and awareness building programs. In Kamburupitiya, user groups have taken over planting 100 reed plants for each plant felled. In the Muruthawela Scheme, members of some farmers' organizations have brought to the attention of the authorities incidences of illicit felling of timber in the catchment areas. In several other areas such as Nuwara Eliya, Kotmale, Udawalawe, etc. people's organizations have planted forest trees along irrigation canals, roadside, reservoir catchment areas, etc. (Source: Report of the Study Tour of the SP, 1992).

agroforestry and other conservation farming practices will be adopted trees will be planted at a density of 10 trees per hectare. The area under agroforestry will produce several other items such as fodder, beekeeping, pasture, etc. In the 1,500 hectares (500 ha of catchment and 1,000 ha of highland), tapping of existing kitul palm together with new planting on a rotational cycle of planting in 4 years and by felling 20 percent of non-productive palms one year after planting, cultivation of medicinal plants, other trees such as bamboo, timber and fruit trees and, goat rearing will be undertaken. In the command area too trees can be grown along canal bunds, in reservations and other fallow areas, which fact is however not taken into account in the calculation of benefits.

It is assumed that the area where agroforestry, conservation farming practices and other activities such as kitul tapping, medicinal plant cultivation/extraction, planting/extraction of reeds and rattan, etc., will be undertaken will yield net returns at the rate of Rs.8,900 [4] per hectare commencing from year 4 although such income is expected to start from year 3. In fact, this source of income could be realized from the beginning of year 2. From year 9 onwards, the net returns are expected to rise up to Rs.10,000 per hectare since by then the bamboos and some kitul trees could be harvested and rattan may have matured for harvesting. Development of local processing industries might add more value, also. This stream of net returns will be maintained. In addition, several other benefits such as improved land use, erosion control, moisture conservation, etc., may also take place from which the other crops might benefit. However, these positive aspects are not included in the economic analysis. The economic analysis does not consider the value of the trees planted in the catchment and command areas for timber purposes.

As trees grow, the benefits are likely to be more which however are not included in this analysis. The trees planted in the catchment and highland areas can be harvested for timber by the 25th year. The timber value is also not included in the analysis since SCOR is not a "production project."

Benefit area 3: Increased user income through expanded agricultural production

Evidence is recorded from several parts of the country as well as in other countries where increased agricultural production has become possible as a direct result of the formation of user groups. Expanded agricultural production in the order of Rs.81.50 per acre has been recorded in one place in Gal Oya Left Bank where an increased area of 717 acres were brought under cultivation in the lower reaches of a particular canal from the water saved in head areas (1985).

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4 For example, when kitul is planted at a density of 148 palms per hectare, the net returns per hectare in the 12th year amount to Rs.37,200 (A.M.A. Abeysinghe 1992). In fact, tapping and removal of excess and unproductive palms in existing natural plantations at half the above density will alone yield Rs.18,600 per hectare from the 3rd year. For estimation of benefits, the net returns of only Rs.5,000 per hectare are used.

In Parakrama Samudra Scheme (PSS) also an additional area of 500 acres in the tail reaches were planted from the water saved in the head-end areas (AICS 1991). Similar experiences were also observed in several other irrigation systems where FOs have been strengthened in Sri Lanka (Perera, R. 1985; TEAMS 1992; Wijayaratna, C.M. 1986). It is likely that rice yield might increase as a result of application of fertilizer and agro-chemicals at the correct time in right quantity which hitherto was not possible due to institutional and other problems. In several ISMP schemes FOs have started to embark on the production of seed paddy, adoption of proper water management practices and the application of technical knowledge all of which were facilitated by the FOs (Study Tour Reports, 1992). However, the full benefits resulting from these activities have not been quantified and documented (Wijayaratna, C.M. 1986).

Wijayaratna (1986) has shown that the benefits of participatory management may also come through increases in yield per unit area and increased cropping intensity. These have been proven under major schemes but not very clear under minor schemes and in the wet-zone areas.

A third possibility is to utilize groundwater for supplementary irrigation during the dry season. In the wet-zone areas of Deniyaya, Kotapola, Telijjawila, etc., there is considerable extent of land where crop production can be intensified by introducing supplementary irrigation during the dry season which extends for about 2-3 months. In the minor schemes in the dry zone, groundwater can be used in conjunction with irrigation water during the dry season. The impact on agricultural production will be much significant in minor schemes and in the wet zone. For example, in the Huruluwewa watershed there are a large number of small tanks in the upper catchment as well as in the command area. Some farmers have already dug wells in the command area (below small tanks) with the help of the Divisional Secretariat, Project Manager, Department of Agrarian Services and the Agricultural Development Authority.

The above benefit stream will continue for 25 years and longer. In addition, planting competitive and high valued crops can produce bigger profits.

Benefit area 4: Increased user income due to new economic products

In schemes where new practices such as the introduction of high-valued field crops into the rice-based farming systems and, non-agricultural enterprises such as duck and prawn farming have been introduced, gross farmer income has recorded an increase. With diversified cropping alone, farmer income has registered an increase by about 3 times (Panabokke, C.R. 1989). Therefore, a positive case exists where the introduction of new economic opportunities has led to increased farmer income. In addition to direct income increase, such opportunities will also result in more employment creation not only in direct production but also in the supply of services required in respect of these products and in processing industries. Diversified cropping with less-water-consuming crops will save irrigation water from which additional area can be cultivated which hitherto was not possible due to lack of water. The benefits from these activities cannot be quantified due to paucity of data.

Benefit area 5: Increased income due to new employment opportunities

The new employment opportunities created will provide gainful employment particularly for the youth. Such experiences have been already recorded in major irrigation schemes such as Rajangana, Nachchaduwa, PSS, Giritale, Kaudulla, Minneriya, etc., where the FOs have established salaried positions such as managers and employed irrigators (Study Tour Reports 1992). These benefits too cannot be quantified due to paucity of data.

Benefit area 6: Increased income due to better marketing

Formation of farmer groups and their engagement in economic activities such as civil contracts, bulk sale of agricultural inputs, delayed marketing of agricultural products have developed bargaining power in these groups. Activities such as delaying marketing until the price increases and the development of direct contacts with the consumer centers have given opportunities for such groups to engage directly in marketing and thereby reaping better profits. For instance, in Minneriya Scheme, FOs purchased paddy in bulk and sold when the price shot up two months later. This alone gave them a profit amounting to Rs.2,890 per hectare.[5] In schemes such as Nachchaduwa, Kaudulla, Minneriya and PSS, the FOs had started to engage in the bulk purchase of and sale of fertilizer and other agro-chemicals and selling to farmers at lower cost. In some schemes, selling of inputs at a lower rate has forced the private traders to lower their prices thus controlling the price, of chemicals and fertilizer. These activities will have far-reaching benefits to the agricultural community.

Benefit area 7: Decreased cost of agricultural production

As FOs have begun to involve themselves in the sale of agricultural inputs and providing them to the member farmers at prices lower than the market price, the cost of production has come down. Evidence from areas such as Nachchaduwa, PSS, Kaudulla, etc., suggests that the farmers have been able to cut rice production cost by Rs.500 per hectare merely by supplying fertilizer and other agro-chemicals at a cost lower than the open market prices (Reports of the Study Tour 1992). It should be noted however that in this particular case the "savings" to farmers would have otherwise gone to the traders of agro-chemicals. Hence, it is a "cost" to the traditional traders of such inputs.

As more user groups are formed and new technologies are introduced, the reduction in cost can be still larger. It is assumed that this benefit will be realized only in year 2 of the project even though it has already taken place in several major schemes. However, this has not yet taken place in minor systems and in the wet-zone areas where the effect could be much more significant.

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[5] Profits by delaying sale of unhusked rice amounted to about Rs.10,000 per 8 tons in Polonnaruwa area. This works out to Rs.5,780 per person or Rs.2,890 per ha. (source: Widanapathirana, A.S. 1991).

Benefit area 8: Increased farmer savings and investments

The formation of FOs and their engagement in economic activities have enhanced the income of the FOs. By undertaking contract works within irrigation schemes, membership fees and the collection of fines have enriched the reserve funds of these organizations. In schemes such as PSS, Giritale, Nachchaduwa, Rajangana, Kaudulla, Padaviya, etc., the FOs have thus been able to save funds and deposit such savings in the bank accounts opened in the name of the organization. On an average, FOs in PSS have built up reserves of about Rs. 257 per member of the organization as at present (1992).[6] It should be noted that in addition to these reserves the FOs have re-invested their savings in other profitable ventures such as purchase of agricultural inputs, unhusked rice, undertaking contracts, etc. These achievements should be compared to the period prior to the formation of FOs when they did not have even a bank account. Now they operate group accounts. For instance, the four organizations referred to above have invested Rs.160,943 on agricultural and other economic activities during the current year. These are significant achievements compared to the period before the formation of FOs.

Benefit area 9: Enhanced sustainability of land and water resources

It is to be **highlighted** that evidence is observed whereby group activities have contributed to the sustainable management of land and water resources. These can be basically divided into four areas namely, better utilization of water resources, enhanced sustainability of the irrigation system, protected environment including the conservation of land and water resources and control of illicit felling of trees mainly for timber. These experiences have been reported in irrigation systems where FOs have been working for the last 5-6 years (Reports of Study Tour July, August 1992). However, most of them except the effective utilization of water resources, cannot be quantified due to inadequacy of relevant data.

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[6] The reserve funds and the membership in respect of four FOs in PSS are given below:

Name of organization	Amount (Rs)	No. members
Pulasthigama	99,807	191
Kegalugama	118,651	250
Ambanganga	42,148	265
Galthambarawa	29,388	320
Total	289,994	1,026

Savings per member 282.65

Source: Project Reports, PSS 1992

With regard to effective utilization of water resources, the following benefits have been attributed to the strengthening of FOs:

As a result of formation of users' organizations the water duty (amount used for cultivating an acre of paddy in the Muruthawela Scheme has come down from 17 ac.ft to 12 ac.ft. in 1991/92. This is expected to further come down to 9 ac.ft. in the near future (Report of the Study Tour, SP 1992). For a water-short system like Muruthawela, where the total command is not brought under cultivation in a typical season, these savings of water can be utilized to increase the area cultivated by about 50 percent. This is a direct benefit resulting from the FOs. In PSS, the amount of water issued in one irrigation has come down from 1,300 ac.ft. in the last yala (1991) to 900 ac.ft. during the present yala (1992) season (personal communication with Project Manager, PSS). Assuming there are 15 irrigations per rice crop, the water saved thus comes to about 6,000 ac.ft. Assuming a water duty of 10 ac.ft. per crop, 600 acres of area can be cultivated with rice from the water saved. This is equivalent to about Rs.8,160,000 assuming a rice (unhusked) yield of 100 bushels per acre and the sale value per bushel is Rs.136. These are significant achievements which are a direct result of the formation and strengthening of FOs in irrigation schemes.

The economic benefits accrued to the component of "participatory management" in irrigation schemes are clear. Ex-post evaluation of several irrigation rehabilitation projects in Sri Lanka has demonstrated that improving water management contributes significantly to project benefits (Aluwihare and Kikuchi 1991). The contrast between two major rehabilitation projects, TIMP and Gal Oya, shows substantially higher internal rates of return and benefit-cost ratios for the latter project, where participatory water management was an integral part of rehabilitation design. In smaller projects, more focused on water management and less on physical rehabilitation, economic returns were seen to be even higher, with rates of return exceeding 70-80 percent (see Table below).

Table 1. Benefit-cost ratios and internal rates of return of the sample rehabilitation and water management projects.

		B/C ratio	Internal rates of return (%)
I.	Major rehabilitation projects		
	TIMP	0.8 - 1.1	8.0 - 11.0
	Gal Oya	1.4 - 2.3	15.0 - 24.0
II.	Water management projects with minor rehabilitation		
	Kimbulwana	6.1 - 13.4	60.0 - 83.0
	Pimburattewa	1.4 - 7.4	32.0 - 77.0
	Nagadeepa	0.4	6.0

The B/C ratio and IRR are for different assumption, hence, a range is quoted here.

Source: Aluwihare, P.B., Kikuchi, M., 1991.

Other project benefits will not necessarily accrue entirely to the individuals and groups doing the work. Positive externalities will result from improved land, water and forest management practices in the catchment areas of the watersheds. A Wold Bank study on vegetative approaches to watershed conservation shows that the costs are low and it is more efficient and sustainable compared to mechanical structures (IMPSA 1991).

A benefit-cost analysis of the Phewa Tal watershed program in the Middle Hills of Nepal showed that on-site benefits of forest, grazing and rice management were nearly double the costs of the program (Fleming, 1983 quoted in IMPSA). It was shown that forest productivity would double with simple management, fodder yields would increase five times and erosion losses would be cut to one-third with pasture protection and stall feeding, and nutrient savings would be substantial with simple farm practices (IMPSA 1991).

The improvements toward sustainable management of land, water and forest resources will enhance incomes downstream, or at least prevent their decline, as well as in the catchments themselves. Benefits of this type are difficult to estimate, but they have been shown to be substantial elsewhere in the region.

Benefit area 10: Improved coordination, policy reform and awareness-building among agency staff

Another area where benefits can be expected is improved coordination of services operated by the government agencies. Expected benefits from such coordination mechanisms may be similar to those generated from the dialogues organized among the concerned officers by projects such as Gal Oya Water Management Project, ISMP, IMPSA, etc. These experiences suggest that by putting the different officers together has helped a lot in making each other aware of the

programs and activities which would eventually bring about better coordination and avoid duplication of efforts and facilitate learning from each other's experiences. Such activities will lead to effective delivery of services including bringing about better awareness of government programs among the rural people. The ultimate effects are better utilization of land, water and other resources, less frustration of rural communities and protection of the natural resources. They cannot be quantified accurately since some of the benefits are intangible.

The possible benefits from coordinated research, experimentation, capacity building and policy/process reform are even less tangible than those discussed above. They could be many times the amount needed to satisfy the Project's economic viability; they could also be negligible if project implementation is ineffective.

Benefit area 11: Tenure alternatives

There is no useful information available about the economics of land tenure alternatives in Sri Lanka. There is, however, international evidence to consider. The economic impact of land titling in Northeast Thailand has been demonstrated by the Wold Bank to be substantial; an internal rate of over 80 percent was found for a massive titling project essentially a program to regularize encroachments (Feder, G. 1989).

3 Economic Analysis

Based on the discussion on quantification of some selected benefits and costs alone, the estimated benefit-cost ratio at 10 percent discount rate is 1.43. Out of the 11 areas of benefits and costs, the analysis was done only for selected benefits and costs which are listed below. [7]

Benefits	Costs
1. Benefits from existing practices	1. Costs of existing practices
2. Savings in government expenses on forest protection, O&M and extension	2. Actual government spending on O&M, forest protection,
3. Income from the additional area benefited	3. Project expenditure
4. Income from new products from catchment	4. Extension and silt removal costs
5. Income from intensive use of highlands	
6. Income from intensive use of command	

[7]In conventional project analysis, economists do not include the income from existing resource bases such as command and highlands. The analysis considers only the incremental benefits. However, we have performed an analysis including the benefits and costs from the existing resources since USAID requested for such an analysis.

Accordingly, it can be concluded that the investments on the SCOR Project are highly beneficial. The details of the calculation are presented in Table 2.

TABLE 2
VALUE OF BENEFITS AND COSTS UNDER THE "WITH PROJECTS" SITUATION (all values in Rs. '000.000)

YEAR	1	2	3	4	5	6	7	8	9	10
A. BENEFITS										
1. Income from existing command...(a)	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44
2. GSL savings (O & M)...(b)	0	1	2	3	3.6	3.6	3.6	3.6	3.6	3.6
3. GSL savings (Forest Protection)(c)	0	0.04	0.14	0.20	0.20	0.25	0.17	0.17	0.17	0.17
4. GSL savings (Extension work)..(d)	0	0.02	0.03	0.04	0.03	0.06	0.06	0.06	0.06	0.06
5. Income from highlands...(e)	42	42	42	42	42	42	42	42	42	42
6. GSL savings on clearing erosion deposits	0	0	5.41	5.41	5.41	16.26	16.26	16.26	16.26	24.39
Total benefit (B1)	666.44	667.05	674.02	675.08	675.68	686.53	686.53	686.53	694.66	694.66
B. COSTS										
1. GSL costs (O & M)...(f)	6	5	4	3	2.4	2.4	2.4	2.4	2.4	2.4
2. GSL forest protection costs..(g)	0.30	0.20	0.20	0.18	0.18	0.17	0.17	0.17	0.17	0.17
3. GSL extension cost....(h)	0.11	0.09	0.08	0.04	0.04	0.05	0.05	0.05	0.05	0.05
4. Project cost....(i)	120	120	160	80	80	40	40	40	80	80
5. Farmer cost....(j)	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45
6. GSL cost to clear erosion deposits ...(k	32.51	32.51	27.1	27.1	27.1	16.25	16.25	16.25	16.25	8.12
Total cost (C1)	495.41	494.35	487.83	486.77	486.17	475.32	475.32	475.32	475.32	467.19
C. NET BENEFITS STREAM 1 [B1 - C1 = NB1]	171.03	173.15	186.19	188.31	189.51	211.21	211.21	211.21	211.21	227.47
D. NET BENEFITS 2										
1. Net income catchment	0	0	0	40	40	40	40	40	40	45
2. Net income (additional area benefited)	0	5.34	5.34	10.68	16.02	16.02	16.02	16.02	16.02	16.02
3. Net income (intensive use of command)	0	12.5	12.5	25	25	37.5	37.5	37.5	37.5	37.5
4. Agro forestry	0	0	42	42	42	45	45	45	50	50
NET BENEFITS STREAM 2 [NB2]	0	17.84	59.84	117.68	123.02	138.52	138.52	138.52	143.52	148.52
E. TOTAL NET BENEFITS [(Cash flow),(NB1 + NB2) = TNB]	171.03	190.99	246.03	305.99	312.53	349.73	349.73	349.73	354.73	375.99
F. DISCOUNT FACTOR (10%) (DF10)	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386

	12	13	14	15	16	17	18	19	20	21	22	23	24	25
624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44	624.44
3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
24.39	24.39	24.39	27.64	27.64	29.26	29.26	29.26	29.26	29.26	29.26	29.26	29.26	29.26	29.26
694.66	697.91	697.91	697.91	699.53	699.53	699.53	699.53	699.53	699.53	699.53	699.53	699.53	699.53	699.53
2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
40	40	40												
456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45	456.45
8.12	8.12	4.87	4.87	4.87	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
467.19	467.19	463.94	463.94	463.94	462.32	462.32	462.32	462.32	462.32	462.32	462.32	462.32	462.32	462.32
227.47	227.47	233.97	233.97	233.97	237.21	237.21	237.21	237.21	237.21	237.21	237.21	237.21	237.21	237.21
45	45	45	45	45	45	45	45	45	45					
16.02	16.02	16.02	16.02	16.02	16.02	16.02	16.02	16.02	16.02	45	45	45	45	45
										16.02	16.02	16.02	16.02	16.02
37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5					
										37.5	37.5	37.5	37.5	37.5
50	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5					
										52.5	52.5	52.5	52.5	52.5
148.52	151.02	151.02	151.02	151.02	151.02	151.02	151.02	151.02	151.02					
										151.02	151.02	151.02	151.02	151.02
375.99	378.49	384.99	384.99	384.99	388.25	388.23	388.23	388.23	388.23	388.23	388.23	388.23	388.23	388.23
0.35	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.12	0.102	0.092
										52.41	47.75	43.48	39.59	35.71

Total discounted benefit (at 10%)	=	Rs.	6,222.48
Total discounted cost (at 10%)	=	Rs.	4,342.27
Benefit:cost ratio	=		6,222.48

			4,342.27
	=		1.43 at 10 percent discount rate

It should be noted that the net benefit stream 2 is not included in the above calculations. These benefits are accrued specifically to this project but the associated costs in producing these benefits are not available. Hence, the estimated benefit:cost ratio of SCOR Project not considering the "new benefits" mentioned above is 1.43. If the latter benefits too are included, the ratio is definitely much higher than 1.43.

As requested by the USAID, a separate project analysis was conducted for a hypothetical "no project" situation. In this situation, it is assumed that the existing pattern of production and resources use such as continued government spendings on O&M, forest protection, extension, etc. coupled with poor protection, destruction in watershed areas, increase in farm costs, decline in yield due to soil erosion, etc. will continue. Hence, without the project, the destruction of the natural resources base and the dependance on the government to undertake resources management will be continued.

The project analysis considering the "without" project option will yiled the results shown in Table 3 below:

TABLE 3
VALUE OF BENEFITS AND COSTS UNDER THE "NO PROJECT" ASSUMPTION (all values in Rs. '000.000)

YEAR	1	2	3	4	5	6	7	8	9	10
A. BENEFITS										
1. Income from existing command..(a)	624.44	616.83	604.48	592.41	580.56	568.94	557.57	546.41	535.50	524.78
2. Income from existing highlands.(e)	42	41.16	40.32	39.52	38.72	37.96	37.20	36.46	35.72	35.0
Total value of benefits	666.44	657.99	644.08	631.93	619.28	606.09	594.77	582.87	571.22	559.78
B. COSTS										
1. Farmer cost...(j)	445.95	436.99	428.27	419.70	411.30	403.08	395.02	387.11	379.38	371.78
2. GSL Costs....(f,g,h)	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45
3. GSL cost to clear erosion deposits...(i)	32.51	34.13	35.82	37.61	39.5	41.48	43.56	45.74	48.02	50.42
Total cost	484.91	477.57	470.54	463.76	457.25	451.01	445.03	439.03	433.85	428.65
C. TOTAL NET BENEFIT [TNB]	181.53	180.42	174.26	168.17	162.03	155.89	149.74	143.57	137.37	131.13
D. DISCOUNT FACTOR (10%) (DF10)	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386
E. NET PRESENT WORTH AT 10% DR [TNB*(DF10)]	165.01	149.02	130.86	114.86	100.62	87.92	76.81	67.04	58.24	50.61
F. DISCOUNT FACTOR (22%) (DF22)	0.82	0.672	0.551	0.451	0.37	0.303	0.249	0.204	0.167	0.137
G. NET PRESENT WORTH AT 22% DR [TNB*(DF22)]	148.85	121.24	96.01	75.84	49.95	47.23	37.28	29.28	22.94	17.96

See explanatory notes at the end of Table 4.

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78	524.78
35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78	559.78
371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78	371.78
6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45
52.93	55.59	58.35	78.22	82.12	86.25	90.54	95.09	99.84	104.85	86.25	90.54	95.09	99.84	104.85
428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65	428.65
131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13
0.35	0.319	0.29	0.164	0.149	0.135	0.123	0.112	0.102	0.092	0.135	0.123	0.112	0.102	0.092
45.89	41.83	38.02	21.50	19.53	17.70	16.12	14.68	13.37	12.06	17.70	16.12	14.68	13.37	12.06
0.112	0.092	0.075	0.023	0.019	0.015	0.013	0.01	0.008	0.007	0.015	0.013	0.01	0.008	0.007
14.68	12.06	9.83	3.01	2.49	1.96	1.70	1.31	1.04	0.91	1.96	1.70	1.31	1.04	0.91

Total discounted benefits (at 10%)	=	Rs.	4,468.87
Total discounted costs (at 10%)	=	Rs.	4,073.95
Benefit:cost ratio	=		4,468.87 ------- 4,073.95 at 10 percent discount rate.

As shown in Table 3, the benefit:cost ratio works out to 1.09% at the discount rate of 10%.

Hence, if there was no project, the returns from natural resource base is just sufficient for the management of the same resources. Continuation of this process will degrade the resource base further. This is highly undersirable for a country such as Sri Lanka whose future progress will be heavily rested in the proper management of its natural resource base.

A third analysis is conducted using the incremental net benefits which are calculated by deducting net benefits of "without" project from with project net benefits. The calculations of IRR is done in this analysis and the results are shown in Table 4.

TABLE 4
INCREMENTAL NET BENEFITS

YEAR	1	2	3	4	5	6	7	8	9	10
TOTAL NET BENEFITS WITH PROJECT	171.03	190.99	246.03	305.99	312.53	349.73	349.73	349.73	354.73	375.9
TOTAL NET BENEFITS WITHOUT PROJECT	181.53	180.42	174.26	168.17	162.03	155.89	149.74	143.57	137.37	131.1
INCREMENTAL NET BENEFITS (INB)	-10.5	10.48	72.77	137.82	15.05	193.84	199.99	206.16	217.36	244.8
DISCOUNT FACTOR (10%) (DF10)	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386
NET PRESENT WORTH AT 10% DR [INB*(DF10)]	-9.54	8.65	53.89	94.13	93.46	109.32	102.59	96.27	92.16	94.51
DISCOUNT FACTOR (22%) (DF22)	0.82	0.672	0.551	0.451	0.37	0.303	0.249	0.204	0.167	0.137
NET PRESENT WORTH AT 22% DR [INB*(DF22)]	-8.61	7.04	39.54	62.15	34.58	58.73	49.79	42.05	36.29	33.54

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			384.99	384.99	388.25	388.23	388.23	388.23	388.23	388.23	388.23	388.23	388.23	388.23
375.99	378.49	384.99												
			131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13	131.13
131.13	131.132	131.13												
			253.86	253.86	257.12	257.1	257.1	257.1	257.1	257.1	257.1	257.1	257.1	257.1
244.66	247.36	253.86												
			0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112	0.102	0.092
0.35	0.319	0.29												
			66.76	60.67	56.05	50.90	46.27	42.16	38.30	34.70	31.62	28.79	26.22	23.65 1498.75
85.63	78.09	73.61												
			0.062	0.051	0.042	0.034	0.028	0.023	0.019	0.015	0.013	0.016	0.008	0.007
0.112	0.092	0.075												
			15.73	12.94	10.79	8.74	7.29	5.91	4.88	3.85	3.34	2.57	2.05	1.79 521.28
27.40	22.75	19.03												

LOWER DISCOUNT RATE	10
DIFERENCE BETWEEN DISCOUNT RATES(22-10)	12
PRESENT VALUE OF INCREMENTAL NET BENEFIT AT LOWER DISCOUNT RATE	1498.75
SUM OF PRESENT VALUES OF INCREMENTAL NET BENEFITS AT TWO DISCOUNT RATES [SIGN IGNORED]	20.20.0
INTERNAL RATE OF RETURN	10 + 12 [1498.75/2020.03] = 18.88

18.88

As shown in Table 4, the internal rate of return of the SCOR Project is 18.88. Hence, based on the above calculation, it can be finally concluded that the investment on the SCOR Project is highly beneficial to the economy where selected benefit types (out of 11 benefit areas which may be accrued to the Project) are considered. If all of the benefits are considered, the IRR could, therefore, be much higher than what is shown above.

Notes

A. Assumptions

a. Rice is cultivated in 95 percent of the dry-zone irrigated command area in 2 seasons.
b. Other Field Crops (OFC) are cultivated in 5 percent of the command area in 2 seasons.
c. Command area is 5,000 ha and highland area 3,500 ha per watershed.
d. If there is no project the command and highland area benefited decreases by 2 percent per year up to year 10 due to poor resources management. Thereafter, it is assumed to be constant.
e. When users' groups are strengthened they will be in a position to undertake most of the work which is now the responsibility of the government. This means a savings on GOSL expenditure which is considered as a benefit to the project. In the meantime, investment by user groups will be increased proportionately to the selection in GOSL expenses.
f. It is assumed that the GOSL will have to incur a minimum expenditure on natural resources management which cannot be reduced further.

B. Estimates Used

a. Rice income (gross) per hectare for 2 seasons in the dry zone is Rs. 42,200.
b. Rice income (gross) per hectare for 2 seasons in the wet zone is Rs. 35,700.
c. OFC income in the dry and wet zones is Rs. 49,600 per hectare per season.
d. Rice production cost in D2 is Rs. 13,800 per ha per season.
e. OFC production cost in D2 is Rs. 24,800 per ha per season.
f. Wet zone rice production cost is Rs. 14,800 per ha per season.
g. Wet zone OFC production cost is Rs. 12,400 per ha per season.
h. Income per year from the highland is assumed to be Rs. 4,000 per hectare.
i. Cost of highland farming is Rs. 1,000 per ha per annum.
j. Actual O&M expenditure incurred by the government is Rs. 400 per ha per year. 40 percent of this represents the O&M of main system.
k. Annual salary and travel expenses of the concerned officers are given below:

	Amount	
BFOs' salary	Rs.	27,000
BFOs', travel allowance	Rs.	10,500
RFOs' salary	Rs.	30,000
RFOs' travel allowance	Rs.	14,100
AIs' salary	Rs.	30,000
AIs' travel allowance	Rs.	14,000

l. RFOs' allocation of time will be as follows:
Courts work 40 percent, administration 30 percent, protection 20 percent, development 10 percent.
m. Net income derived from the catchment through kitul-based activities is Rs. 37,200 per hectare.
n. Net income from the command area using agro-wells works out to Rs.89,280 per hectare.
o. Average income from one hectare of the command under intensified use is assumed to be Rs. 25,000.
p. Cost of cleaning silt from roads, irrigation canals, etc., due to poor soil erosion control practices is taken as Rs. 1,275 per hectare.

Sources:
(a) - (g) - Department of Agriculture, 1992
(h) and (i) - AR&TI, 1986
(j) IMPSA 1991
(k) - (d) Personal Communication, FD and AD, 1992
(m) Abeysinghe, A.M.A, 1991
(n) Karunasena, G, 1992
(p) Herath, 1989.

Note:

BFO - Bead Forest Officer
RFO - Range Forest Officer
AI - Agricultural Instructor

C. Explanatory notes

(a) Income from existing command

In the command, rice and OFCs will be cultivated. It is assumed that 95 percent of the area will have rice and the balance 5 percent OFCs.
Accordingly, income from the existing command is estimated as follows:

Rs. 21,100 x 7125 ha x 2 seasons + Rs. 17,850 x 7125 ha x 2 seasons
(D2 rice income) (W2 rice income)

+ Rs. 49,600 x 375 ha x 2 seasons + Rs. 49,600 x 375 ha x 2 seasons
(D2 OFC income) (W2 OFC income)

= Rs. 300.67 million + Rs. 254.36 million + Rs. 37.2 million +
Rs. 37.2 million

= Rs. 624.44 million

Through group activities of users' organizations (e.g., economies of scale, better information and input delivery, etc.), there shall be an increased yield and income from the project. However, for the analysis, it is considered that the income would be constant throughout the project.

Under the "no project" situation, it is assumed that the command area benefited will decrease annually due to management problems. It is also assumed for the calculation that there will be no new projects to rehabilitate the irrigation infrastructure. This trend of reduction in the area benefited at 2 percent per annum will continue until year 10 and constant thereafter.

(b&f) Government expenses on O&M

The cost of O&M work in respect of 500 ha command is calculated as follows:

Rs. 400 x 5000 ha = Rs. 2,000,000

For 3 watersheds or a total rice area of 15,000 ha, the expenditure shall be Rs. 6 million.

In year 1, there shall not be any savings of government cost. In year 2, since the user groups in the two watersheds will be doing O&M work, there will be some savings of government expenditure. Out of the O&M costs, 40 percent will be on the main systems which will be beyond farmers' capacity. The number of watersheds included in the project is increased and with the users' organizations' take over of O&M tasks, the government cost will be saved.

Accordingly, it is assumed that in year 2, 3 and 4 the savings are respectively Rs. 1, 2 and 3 million. From year 5 onwards, the savings are constant (Rs. 3.6 million) since Rs. 2.4 (Rs. 6-3.6) will have to be spent by the government on main system O&M work.

Without the project, it is expected that the government will have to incur the above expenditure annually. User groups will be strengthened by the project which will in turn undertake O&M work. However, the government will have to continue spending a minimum of amount on O&M costs that user groups will be not able to afford in the foreseeable future.

(c&g) Government expenses on forest protection

Cost of protection of forests in 1,500 hectares of catchment is calculated as follows:

$$\frac{44100}{100} \times \frac{20}{10} + 37500 \times \frac{1500}{500} \times 3 \text{ watersheds}$$

Part of RFO's salary (882 + 337,500) BFO's salary

= Rs. 338,382 per year
= Rs. 0.34 million

If there is no project, the government will have to continue spending a minimum of Rs. 0.34 million annually in protecting forests. This does not include forest planting and other management costs. It is assumed that 50 percent of this expenditure is sufficient to protect forest if there are effective users' organizations to undertake protection work. Hence, the actual savings in GOSL expenditure will be Rs. 0.17 million $0.\frac{34}{2}$ per year.

(d&h) Government expenses on extension work

Government expenditure on extension work is calculated on the basis that each agricultural instructors' (AI's) annual salary and travel allowance is Rs. 44,100. Each AI is expected to cover 10,000 ha area. The extension cost for 3 watersheds is, thus,

$$\text{Rs. } \frac{44{,}100}{10{,}000 \text{ ha}} \times (5000 \text{ ha (command)} + 3500 \text{ ha (highland)})$$

$$= 4.41 \times 8500 \times 3$$

$$= \text{Rs. } 112{,}455 = \text{Rs. } 0.11 \text{ million.}$$

It is expected that 50 percent of this expenditure would be saved if users are organized into groups. Group extension is cost-effective compared to individual farmer-focused extension with effective results in the case of the farmer. Hence, the savings per year will be approximately Rs. 0.06 million.

With project calculations.

(e) **Income from existing highland**

Rs. 2,000 (seasonal income from 1 ha highland) x 3,500 ha x 3 watersheds (highlands of 10,000 ha watershed) x 2 seasons

= Rs. 42 million.

It is expected that the project will assist user groups with activities such as expeditious issue of land permits, transfer of government-owned land to user groups, better availability of information, etc., which would lead to soil conservation within turn lead to enhanced protection of the highland areas. Group credit, input procurement and better advice will improve the yield and income from highland areas. However, for calculation purposes, the income stream is considered constant throughout the project.

Additionally, adoption of agro-forestry practices and other income-generating agricultural practices will increase the income from highlands by several folds. These are not considered for the calculations.

In the case of the "without project," the income will decline due to loss of soil fertility and soil moisture limitations. It is assumed that the income will decline at 5 percent up to year 10 and constant thereafter.

(i) **Project costs**

The total cost of the project including the budgetary support is Rs. 600 million. Out of this the budgetary support component may not be spent in this specific project since the government may utilize it elsewhere. However, it is assumed that the total funds earmarked for the SCOR Project, i.e., Rs. 600 million, will be spent on this Project.

At the commencement, project disbursements will be rather low which will increase up to Rs. 160 million in year 3. Thereafter expenses will be low until funding is over by the 6th year.

(j) **Farmer costs**

This includes production costs on the highlands and the command area.

Highland production costs

Production cost in respect of the highlands in 3 watersheds which will have to be spent by farmers is calculated thus;

Rs. 1,000 x 10,500 ha x 2 seasons
= Rs. 21,000,000 = Rs. 21 million

Command production costs

Production cost in respect of the command which will have to be borne by the user is calculated as follows;

Year 1 cost:

Rs. 13,800 x 7125 ha x 2 seasons (rice production cost in the dry zone) +
Rs. 24,800 x 375 ha x 2 seasons (OFC production cost in the dry zone) +
Rs. 14,800 x 7125 ha x 2 seasons (rice cost in wet zone) +
Rs. 12,400 x 375 ha x 2 seasons (OFC costs in the wet zone)
= Rs. 435.45 million.

It is assumed that the area benefited will be reduced annually by 2 percent until year 10. Thereafter, the costs are considered to be constant.

(k) **Silt removal cost**

It is reported that by constructing stone terraces, soil loss could be reduced which otherwise ends up on roads and in irrigation facilities. The benefits accruing from avoiding annual removal of sediment from roads and irrigation facilities is estimated as Rs. 1,275 per hectare per year (Herath 1989).
This will amount to Rs. 10.83 million in respect of 8,500 ha (command 5,000 ha and highland 3,500 ha) of the watershed as shown below:

Rs. 1,275 x 8500 ha = Rs. 10,837,500

For 3 watersheds, the cost of silt removal will be Rs. 32.51 million.

It is assumed that 50 percent of government cost can be saved since project activities will lead to reduced soil loss. Another 50 percent cost will have to be spent by the government since cleaning silt from public utilities such as roads and main system of irrigation schemes is considered to be the responsibility of the State.

It is to be noted that the effect of soil loss on fertility of agricultural land will be substantial which, however, cannot be estimated due to lack of data.

(l) **Income from catchment**

In the immediate catchment of the watershed, there will be various products such as kitul-based activities, extraction of medicinal plants, use of rattan and reeds, beekeeping, etc., Utilization of these products will generate returns to catchment users. These benefits are not obtained at present and the project is expected to utilize them in a planned basis, both in the dry-and wet- zone areas. For calculation purposes, an average figure for the 2 zones is used. The volume of benefits will increase with the life of the project as more watersheds are included and the extent of utilization and marketing are intensified. Calculations are shown below:

Year 1-3	:	Benefits are not included
Year 4-9	:	Benefits are calculated as follows:
		Rs. 8,900 x 1500 ha x 3 watersheds = Rs. 40 million
Year 10-25	:	Rs. 10,000 x 1500 ha x 3 watersheds = Rs. 45 million

These returns are net values.

(m) **Income from additional area benefitted.**

Evidence indicates that FOs operating in about 9,275 ha of command can save water which is sufficient to cultivate about 2,000 ha of land with rice. This means if FOs are strengthened within a command of 5,000 ha, the water thus saved can irrigate an additional area of 107

ha. Assuming net returns to one hectare of rice as Rs. 4,960 for 2 seasons, the net income resulting from the additional area benefited through the water saved is Rs. 4,245,760.

(n) Income from intensive command use

Income from the intensive use of the command area is calculated on the basis that 500 ha will have high-valued cash crops. The main forms of command utilization will be through the exploitation of shallow groundwater for crop protection. It is seen from the existing experience in NCP that the net returns from one hectare under shallow-well irrigation is over Rs. 25,000. (Records of NCP by ADA 1990) A value of Rs. 25,000 per hectare is used here. The calculations are as follows:

Rs. 25,000 x 500 ha x 3 watersheds = Rs. 37.50 million.

From year 1 onwards the number of watersheds where this practice will be followed is expected to increase until year 5. Thereafter, the total net returns from the 3 watersheds will be Rs. 37.50 million as shown above.

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CONSTRAINTS ANALYSIS

This analysis supplements the analysis in the NAREPP Project Paper (Sri Lanka:383-0109). This focuses primarily upon the natural resources management constraints relating to the need for increased agricultural production, an area not specifically addressed in the NAREPP Project Paper (USAID 1990).

1. Land and Water Management for Irrigation

Irrigation constitutes the largest single user of water in Sri Lanka, and it is by far the largest consumptive user of water. With two-thirds of the water in the dry zone, and one-third of the water in the wet zone currenntly utilized, there is an obvious need to improve the eficiency with which irrigation water is utilized. There are two basic ways in which this can be accomplished: (1) by increasing the technical eficiency of irrigation practices; and (2) by increasing unit-water agricultural and economic productivity. There are a number of constraints to achieving each of these goals.

Technical water use efficiency is defined as the ratio of water productively used by crops to the supply diverted for use. Typically, the determination of technical water use efficiency is carried out at the system level, with losses primarily in the form of deep seepage and surface drainage. However, in Sri Lanka, there is significant recovery of surface drainage water by downstream users, and the real potential for increasing technical efficiency is unknown. Similarly, deep seepage either recharges the groundwater reservoir or reappears as drainage water. The only potential for real saving in irrigation water is in the **last system before drainage to the** sea. Even here, a significant reduction in flow to the sea can have serious adverse impacts on the productivity of the coastal zone by changing the position of the salt water interface and reducing nutrient contributions to biologically active estuaries. The **lack of information** about the amount of water reaching the sea, and the environmental implications of reductions is a serious constraint on improving water use efficiency. Some greater knowledge about this is expected to be generated under NAREPP.

The potential for **increasing the unit productivity of water** in both production and profitability terms is likely to be much greater than increasing technical efficiency. A variety of factors constrain the ability of farmers to achieve increased production and profitability. The lack of secure land tenure, the lack of user participation in decisions about the amount and timing of water availability, their inability to gain economies of scale with respect to purchasing of inputs, operation of holdings and marketing or produce, and inappropriate government commodity price and import policies are illustrative of these constraints.

2. Watershed Management

There is increasing concern for the environmental impact of inappropriate activities in the upper catchment areas of major reservoirs. This concern usually focuses on the acceleration of soil erosion, commonly associated with deforestation, though there are few direct studies to define the extent or cause of the problem. Most of the evidence is derived from data on sedimentation in the major reservoirs, supplemented by visual observations. While concern for the useful life of major reservoirs is appropriate, there are important environmental impacts on the vast number of smaller reservoirs. These include deterioration of watter quality as well as loss of capacity through sedimentation.

The major constraints on remedying the problems of watershed management include the lack of adequate economic alternatives to utilization of the watersheds for agricultural and other activites, the lack of appropriate institutional mechanisms for economic and land use palnning on a watershed basis, inadequate understanding of cause and effect relationships between watershed use practices and environmental problems, and a lack of understanding by persons living and working within the watershed of the cumulative impacts of their individual actions.

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SOCIAL SOUNDNESS ANALYSIS

This Project has taken as its main scope the development of selected watersheds, to try out innovative experiments in order to achieve its objectives. The people in the rural areas have always looked upon a watershed (which includes the upper catchment areas, the command areas and the drainage) as one single unit, since their livelihood is so closely tied to its resource base. **It has therefore provided a sustainable natural resources use base for the community.** Due to colonial legislation like the Crown Lands Ordinance, the forests and catchments were taken out of the people and vested with the crown. The people were given individual allotments under large irrigation schemes and the usefulness of the drainage was forgotten. All these have led to environmental degradation and uncontrollable loss to land water and environmental resources.

Although it is not possible to immediately measure the sociocultural impacts directly attributable to the project, yet in the long run the social/environmental impacts can be assessed through targeted research.

The Project Beneficiaries

The SCOR Project will have both direct and indirect benefits to the people. The direct and immediate beneficiaries will be the people living within the watersheds. This project will provide them with opportunities to form viable farmers' organizations to embark upon income earning activities. They will also have access to land coming under the catchment for their use in innovating cropping patterns. The government and agency officials and farmers in this area will receive training which will make them better-equipped and empowered to analyze problems, and develop, plan and implement programs. Above all, their resoruces will be used to perform activities directly benefiting the community. The private sector will be enriched with better credit and marketing sources to enhance their income earning capacities with the development of agro-industries and processing activities. The unemployed youth will be provided with employment opportunities and improvement of their skills. The farmers will be enriched with better cost-effective waste-control technologies to control pollution, etc.

Indirect project beneficiaries include all those who benefit from training programs, namely the school children and adults. A sense of awareness about the need to protect the environment will be developed. At national and provincial levels the beneficiaries include the policymakers, those who could use the lessons learnt from the experiments for their area watershed development. The project will also curb the opportunities of those who mismanage the environment and help to degrade the forests and catchments. Once the users are organized they will be more responsible and alert and alive to such unsocial activities presently found in watershed areas.

GSL Commitment to the Project and Participation

The Government commitment to the protection of the environment and enhancement of the natural resources base has been proved by the measures it has already taken in this direction.

The core group of government officials from all ministries and departments connected to land, water and environment is directly responsible for the preparation of this project paper. The enthusiastic response received by the Design Team when it visited the provinces and the field was indicative of their interest and committment.

Sociocultural Feasibility

One of the novel approaches of this project is the recognition of the watershed as one unit in keeping with people's cultural acceptance of this fact from very ancient times. Unfortunately, attempts to protect the environment in the watersheds up to recent times have been promoted as a regulatory approach rather than a community-based approach. Several laws aimed at solving this problems have not met with success. Therefore, there is an urgent need to get all sections of the people living within the watershed to be made responsible for its protection and development.

Risks and Assumptions

Sociocultural risks to the project are posed on several fronts. One risk is the transformation of the adminsitrative mechanism presently taking place in the provinces and districts as a result of the devolution of powers and functions of the government under the 13th Amendment and the Pradeshiya Sabha setup. There is still some confusion as regards the division of authority among each sector; there is also the suspicion by the provinces about those activities coming down from the center. This has to be overcome through close dialogue, establishing close relationships and also by involving the provincial and divisional officials in project activities as already outlined in the Project's organizational chart arrangements.

The existing laws and regulation may restrict the implementation of innovative experiments. This may be true in the case of forest uses or in the establishment of certain types of company modes. The only way this can be overcome is by looking for feasible alternatives while at the same time canvassing for policy changes at national level.

These risks should be understood by the Project Working Groups at the very outset itself so that the project implementation programme will not be affected due to the presence of these constraints. Alternative strategies should be worked out well in advance and experiences in other countries may be useful in arriving at such decisions.

INSTITUTIONAL/ADMINISTRATION ANALYSIS

This analysis supplements that provided in the NAREPP Project Paper (Sri Lanka: 383-0109) 1990 and it focuses primarily on the institutional capacities and arrangements that will affect implementation of the SCOR component of NAREPP: the legal situation concerning resources user groups and their formation and operation; the functioning of government agencies in the land and water resources sector; the capabilities of nongovernmental organizations (NGOs) for supporting participatory natural resources management; the feasibility and effectiveness of the organizational approach in natural resources management.

1. User group laws and institutions

Sri Lanka has a long histroy of legislation concerning agricultural (land and water) resources user groups, but with regard to forest resources, laws have focused on permissions or prohibitions for individuals, not groups. In how far new or amended legislation is needed to cover user groups not specifically involved with land and/or water will need to be assessed by the Project in its first year. Possibly some interpretation of existing laws or new implementing regulations based on them will be sufficient.

Legislation concerned with land and water use in the agriculture sector was similarly focused on individuals until the Paddy Lands Act of 1958 (Herring 1984). This went beyond the individual focus of its predecessor, the Paddy Lands Act of 1953, to establish Cultivation Committees (CCs) comprising landowners and tenants. The law applied only to irrigated areas. One task of the CCs was to help implement the land and tenancy reform called for by the law, but another was to plan local production, especially in irrigated areas (on a yaya or tract basis), including collective actions to use water more efficiently and to protect the crops.

This legislation was superseded by the Agricultural Productivity Law of 1972, which maintained CCs but added higher-level Agricultural Productivity Committees (APCs) based in Agricultural Productivity Centres which were constructed throughout the countryside after 1972. While this law focused efforts on irrigated areas, Agricultural Productivity Committees and Centre covered and served rain-fed areas as well. This brought upland farners as such into organizations for the first time. The APCS were empowered to remove control of land from individuals who did not use this resource as efficiently and intensively as possible. Thus, land and water resources use was a primary motivation of this legislation. The Agricultural Lands Act of 1973 added agricultural tribunals to the array of local institutions active in rural areas.[8]

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[8]We will not discuss here rural organizations like the Rural Development Societies which were not given any direct land and water-resources management role (Uphoff and Wanigaratne 1982)

In 1977, the APCs and CCs were abolished, being replaced by Cultivation Officers and Agrarian Service Committees based in Agrarian Service Centres, provided for under the Agrarian Services Act of 1979. Instead of users' organizations such as the CCs and APCs (the APCs also included strong representation of officials along with farmer-representatives), the Agrarian Service Committees had a representative majority, and instead of farmer groups at the field level, farmers elected **yaya palakas** (tract managers) to act on their behalf as intermediaries with the Agrarian Service Centres.

The Irrigation Ordinance enacted in 1968 to cover practices in irrigated areas specified various rights and duties of individuals but did not establish resources user groups. Instead, it gave legal recognition to a long-standing traditional practice of having farmers meet before each cultivation season in what are known as kanna meetings. Under the Ordinance, kanna meetings were chaired by the GA or his representative. These meetings would establish a cultivation calendar of activities. Dates were set for having channels all cleaned, the first water issues for land preparaion, the first water issues for planting and crop growth building protective fences, etc.,

By tradition, most irrigated tracts had an irrigation headman (*Vel Vidane,* called Watte Vidane in Tamil-speaking areas), who oversaw and coordinated farmer activities in the past. This role was given some status under the Irrigation Ordinance and was given legal recognition by the Paddy Lands Act of 1953. Such headmen were entitled to payment of a share of the rice produced. After 1977, Yaya Palakas in irrigated areas assumed Vel Vidane responsibilities. But such roles did not have any formal accountability to an organized and empowered user group. Rather their accountability was upwards, to the Irrigation Department or the Department of Agrarian Services.

Various informal experience with water user groups, building on traditional community roles and responsibilities continued to occur. The first recognized one was established at Minipe in 1978 by the Deputy Director of Irrigation for Kandy. The USAID-supported Water Management Project begun in 1979 provided for experimental introduction of farmers' organizations in the Left Bank of the Gal Oya Irrigation Scheme in Ampare District, starting with a pilot area of over 5,000 acres in 1981, and using Institutional Organizers (IOs). By the end of that project, there were over 500 field-channel groups, federated through a structure of distributary channel organizations (DCOs) and area councils up to the project level, covering over 25,000 acres with participatory management. After some initial resistance to this approach, the Irrigation Department and other agencies started cooperating in a regime of water management that, together with physical rehabilitiation, almost doubled the efficiency of water use. Farmers reported increased yields associated with better water management of from about 40-60 bushels per acre to 80-120 bushels per acre (Uphoff 1992).

In 1984, encouraged by experience at Minipe and Gal Oya, the Ministry of Lands and Land Development established an Irrigation Management Division which introduced the INMAS program of participatory water management in major irrigation schemes. Farmers' organizations were introduced through Project Managers, and in some schemes with assistance from

Institutional Organizers (IOs) and/or selected Gal Oya IOs appointed permanently as Institutional Development Officers.

The structure of farmers' organizations was basically the same as that created at Minipe and Gal Oya in consultation with farmers.[9] This was the first widespread establishment of resources user groups. As of July 1991, the number of field channel groups recognized by IMD is 7088, and the number of DCOs is 746. There are 39 Project Management Committees managing major schemes in a participatory management mode with a majority of farmer-representatives. In many places now, a farmer-representative serves as chairman of the Project Committee. Under the USAID-assisted Irrigation Systems Management Project, covering schemes in Polonnaruwa, Kurunegala and Amapare districts, farmers' organizations have undertaken a variety of activities going beyond irrigation management to increase farmers' share of value-added and to meet various social needs of the community (IMD 1991).

The Agrarian Services Act was amended in 1991 to strengthen legal provisions for agricultural user groups. Farmers' organizations established in major irrigation schemes under the INMAS program (or under the Gal Oya WMP and ISMP) are able to get legal recognition under this act, either by applying to the Commissioner of Agrarian Services or to the Secretary of MLIMD or his agent. The amended Act also gives farmer organizations (including in upland areas) options of legal registration under the Commissioner of Agrarian Services, under the Cooperative Law as farmer cooperative or under the Company Law as farmer companies.

There is a long-standing possibility for user groups to become organized and registered as cooperatives. The country's Cooperative Law dates back to 1910, with many subsequent amendments. One in 1958 provided for producer cooperatives. Basically, however, the provisions of the Cooperative Law and their implementation have applied to consumer, credit or marketing cooperatvies activities, not to collective management of land and/or water resources. The provision for producer cooperatives could be relevant and useful for fishermen cooperatives, such as might exist or be formed for exploiting reservoir or river waters. These could be assisted and/or formed under SCOR.

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[9]The Gal Oya Water Management Project had provided for an expatriate consultant to draft a law for establishing water users' association as one of that project's first activities. The draft was essentially a translation of a similar one enacted in Pakistan (without widespread success). Fortunately, the Ministry decided not to enact the law without some field experimentation. The system of organization evolved with farmer inputs in Gal Oya was much simpler and was based on more bottom-up involvement of resources users (not top-down establishment of organizations by government officials, as the draft law provided). The INMAS program was able to extend the Minipe-Gal Oya model of organization without passage of any law. The model was accepted because it suited farmers' interests and capabilities.

The Agrarian Services Act as currently amended may provide sufficient basis for user groups under SCOR, but this need to be explored with the relevant authorities once the situation of existing and potential user groups is known in the pilot watershed areas.

2. Government institutions concerned with resources management

The listing and analysis of government institutions concerned with "environmental management" in the NAREPP project paper, annex (XI) deals only in passing with those that would be relevant for SCOR, mentioning the Ministry of Lands and Department of Agriculture.

The main ministry involved with implementation of SCOR will be the Ministry of Lands, Irrigation and Mahaweli Development (MLIMD). The following departments, board and commissions would be involved and most have already been consulted in the design process:

* Department of Forests (involved with implementing the ADB-funded Participatory Forestry Project)
* Irrigation Department (concerning control structures and command areas within any major irrigation schemes in selected watershed)
* Department of the Land Commissioner (central role in SCOR)
* Department of Land Settlement (if watersheds involving land title settlement are chosen for pilot areas)
* Department of Survey (concerning land titling)
* Department of Wildlife Management (if nature reserves are in watersheds)
* Irrigation Management Division (concerning water users' associations in any major irrigation schemes in selected watersheds)
* Land Reform Commissioner (if land distribution becomes involved)
* Land Use Policy Planning Division (central role in SCOR)
* Mahaweli Economic Authority (if selected watersheds include any settlement areas under Mahaweli Authority)
* Water Resources Board (concerning water resource planning decisions)

Closely associated with Project activities, given their concern for sustainable and productive utilization of land and water resources will be the Ministry of Agricultural Development and Research. Two major departments under this Ministry are particularly improtant:

* Department of Agriculture (which is responsible for research and extension)
* Department of Agrarian Services (which is responsible for provision of production inputs, including facilities for banking credit)

A third ministry with definite involvement in SCOR's area of concern, which is already very closely involved with NAREPP, is the Ministry of Environment and Parliamentary Affairs. Its Secretary has served on the Core Group for SCOR, and this ministry has expressed interest in SCOR because it represents one of the first substantial links between environmental protection

and agricultural production activities. The Ministry of Policy, Planning and Implementation will have a role because of its concern with coordinating development efforts, especially donor assisted ones. Because SCOR is concerned with capacity building at decentralized levels of government, the Ministry of Public Administration, Provincial Councils and Home Affaits will also have a role in project implementation.

The structure of regional and local administration/government below the centre has been changing in recent years. The District, of which there are 24, constitute the main linchpin of administration, with elected District Development Councils. But with the government's policy of devolution (enunciated under the 13th Amendment to the Constitution), the main focus of administration and representation is the province, of which there are 9, subsuming the existing district administrations. The powers of the chief district official, the Government Agent (GA), are being revised from those of executive authority to roles of coordination.

The Division is becoming a much stronger unit of administration/government, with the Additional Government Agent (AGA), now to be called the Divisional Government Agent (DGA), taking on executive and coordinating functions. He will serve also as the Secretary to the Pradeshiya Sabha, an elected body of which there will be one or two per Division. There are currently 280 Divisions. The Project design calls for work in two pilot Provinces viz. the North Central Province and the Southern Province. The number of Divisional Government Agents' divisions to be involved will vary with the watershed basis being adopted for determining and delimiting pilot areas, and since watersheds can cross two or even three divisions.

Initially, two watersheds have been selected covering three Divisional Government Agents' areas. With the selection of a few more watersheds, as the Project proceeds, SCOR anticipates working with about five Divisional Government Agent areas.

The Provincial authorities have expressed their strong interest and willingness to implement Project activities in their areas and have approved the selection of the initial set of watersheds. (See minutes of meetings with Chief Secretaries in attachments 1 and 2 to this Annex).

The Divisional Government Agent in the selected watershed areas viz: Galendindunuwewa and Palugaswewa in the NCP and Kotapola in the Southern Province, have been met with and their capabilities and the capacities assessed (See Annex XIII Description of the Selected Watershed). These assessments confirm the feasibility of commencing Project activities in these areas.

The legal authority of Pradeshiya Sabhas at present is derived from existing statutes governing farmer village councils and Town councils, assigning them responsibilities for public health and sanitation, markets, weights and mearsures, and similar "local government" responsibilities. Thus, they are not involved in land and water resources management, apart from their urban uses. The Project will work closely with the concerned DGAs and their

respective District Secretariats, particularly through the Watershed Resource Management Teams to be constituted at the watershed level. Liason will be maintained with the relevant Pradeshiya Sabhas, and they will be involed with participatory natural resources management to the extent practicable and relevant.

3. Non-governmental organizations concerned with resources mangement

3.1 NGOs. The NAREPP Project Paper has an analysis of NGOs concerned with resources management. The Nation Builders' Association, which has been involved with organizing water users in irrigation schemes and with forest replanting efforts, is very relevant for activities of the SCOR Project. Others which are characterized as more specifically "environmental" NGOs, such as March for Conservation and Wildlife and Nature Protection Society or the Environmental Congress, are more involved in public education and less with action research or experiments at local levels. We hope to get the latter involved in the pilot areas through the NAREPP component they are already engaged, to help implement.

IIMI has done a survey of NGO experience and capabilities for improving irrigation management through users' organizations (Dayaratne and Wickremasingh 1990). There are a number of NGOs with some capability in this area, e.g., the Freedom From Hunger Campaign Board (Hower 1984), CARE, the National Development Foundation (Perere 1988), and Sarvodaya Shramadana (Junegeling 1989), though not all of this experience has been positive or effective. Just because work is done by NGOs there is no guarantee that it will be successful. Accordingly, the Project must select carefully which NGOs to work with and must be prepared to invest in some upgrading of capabilities, which is indeed planned as part of the Project.

3.3 **Private sector.** The NAREPP Project Paper likewise analyzes capabilities of business and professional organizations that could become cooperators in this area of innovative work. Differenct kinds of private business and organizations would be appropriate for SCOR than for NAREPP. For implementation of activities aiming to achieve shared control of natural resources, the most important private sector role will be in providing support services to use groups. This will require identifying private sector suppliers of inputs and buyers of commodities who are willing to share the benefits of economies of scale with users who have become organized to intensify and make more profitable as well as sustainable their economic activities, agricultural and non-agricultural.

Such enterprises are likely to be found at the level of provincial and district towns more than in Colombo or Kandy. Accordingly, the Provincial Project Staff will explore possible private partners based in Anuradhapura, Polonnaruwa and Galle as the first step toward enlisting private sector participation in SCOR activities. Less than with NGOs, it is not expected to find private bodies with much experience working with organized users. So Project staff, working with provincial and divisional officials and local chambers of commerce, will undertake to be active "brokers" with private enterprises. Identifying and assisting them to become effective in cooperating in participatory resources management are two of the Project activities and, thus, having strong besiness to work with is not a prerequisite for Project implementation.

4. Feasibility and Effectiveness of the Organizational Approach in Natural Resources Management

Various types of local institutions are required to manage the three interconnected natural resources of water, soil and biomass. Firstly, there is the management of irrigation water. Here the management is directly linked to production and the institutions can be built into the irrigation system. Secondly there is forest management which involves the utilization of tree related plant and animal population that perpetuate the forest eco system. Here too the resources are best managed by the community through institutions under social forestry programmes. Thirdly, there is cropland or soil conservation management. This relates to controlling erosion, restoring soil nutrients and maintaining soil structure and requires a strong local institutional base. Taken the totality namely, the watershed which includes the management of the water cycle, through activities of forest and soil management, it needs organizations at local level for mobilising local efforts and for natural resource management. There are a number of options for selecting such institutions such as local administration agencies of the government, service organizations working on a non-profit basis (NGOs), private business working on the basis of profitability and finally the user groups or members who are actually involved with resources and with associated productive activities.

When we analyze the performance of each of these groups, we can see both advantages and disadvantages. However, in conclusion, the most suitable are the user groups having a stake over their natural resources. This is why the SCOR Project has suggested an organizational approach giving the user group the most important place (WRMTs). The basis for the success of such user groups is found in the following factors. Firstly, the resource users in a watershed are dependent upon one another for their livelihood and even survival. Secondly, the tasks of local institutions are simplified when most of the users are homogeneous. Conflict over natural resource use is less likely, when users see themselves as unified by kinship, as found in traditional NCP villages in Sri Lanka. User involvement makes it easy when it comes to discussion, planning and implementing. Thirdly tradition is another reason for the success of management of user groups. Fourthly, the success of user groups is the principle of sharing "common profits". Therefore, if the forest, water, and other resources in a given watershed are held within the community there is greater protection and security in the management of such resources. Our experience in the country is that the option of government agencies trying to manage natural resources without the participation of the users has failed.

Taking some examples from other countries we find that privatisation of rangeland in Botswana as a solution to its degradation failed in its implementation because then there was no communal management (Dikare and Dyson Hudson 1983). However, the management of common pastures in Nepal dating back from the 13th century without deterioration of the resource base is an example of user groups success in the management of natural resources (Netting 1976).

In the sphere of irrigation water management there are a large number of examples of successful water user associations built around common interests in acquiring and sharing water,

maintaining the system and resolving conflicts. eg. Subaks in Bali and the INMAS programme in Sri Lanka.

In the sphere of social forestry when management is done largely by the people living nearby such forests, it is regarded as a departure from the conventional bureautic approach. Normally people are regarded as enemies rather than partners in forest management. Examples of forest management comes from Nepal where, after 1977, the Forest law was changed to give the local Panchayat clear responsibility for forest management and all or most of the immediate benefits from improved management accrued to the community. A World Bank study on social forestry in Pakistan has recommended that locally elected bodies at village level be given effective institutional support and the government forestry land be allocated to such elected bodies (Cernee 1980).

In Sri Lanka too both past and present experiences have proved that local bodies can take over natural resources management functions. The water management project under the INMAS programs, the earlier experiments under the Productivity Committees and cultivation committees go to prove this point.

One important reason for the success of any natural resource management programme is the need to provide long-term security, as benefits from tree planting and protecting trees are essentially long-term activities. Therefore, the transfer of forest to the user groups should be either by law or through a firm agreement. There is the case of social forestry programme in the Indian State of Gujarat funded by the World Bank, where the community components could not be sustained for lack of effective devolution to local bodies.

In Sri Lanka under the Social Forestry Programme funded by the ADB the "Turulatha" societies are given assistance to develop nurseries, and the planting meterial is purchased by the Forest Department. However, there is no formal handing over of forestry areas to these societies.

The best example of social forestry is found in South Korea where the Village Forest Associations which were started in 1961, have taken responsibility for managing over 2 million acres of local forestry lands. In India, in the State of Uthar Pradesh, the tribal user people are protecting the forests through a movement called the Chipko movement. The Northern Agricultural Development Project in Thailand and the Damodar Village Corporation in India have succeeded due to the combined efforts of user groups in activities like input supply provision of social services, transport and introduction of new crops.

Thus the participation of local people through user groups in managing their own natural resources is very crucial to the success of any watershed management project.

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Attachment I

Minutes of the meeting held with the Chief Secretary, North Central Provincial Council and the Secretary to the Chief Minister on the proposed GOSL/USAID Project for Shared Control of Natural Resources (SCOR).

The above meeting was held on 2nd September 1992 from 4.00 p.m. to 5.30 p.m. at the office of the Chief Secretary.

2. The following were present.

Mr. K.B. Sirisena, Chief Secretary, NCP.
Mr. Dharmadasa Senadhira, Secretary to the Hon. Chief Minister, NCP.
Dr. C.M. Wijayaratna, Head IIMI/SLFO.
Mr. I.K. Weerawardene,)
Mr. Anura Widanapathirana,) Consultants, IIMI/SLFO.
Mr. Paul Rajasekera)

3. The IIMI team referred to the discussions they have had with the Chief Secretary, and also with other Provincial and Divisional level officials (at a Workshop at Habarana), during the past few weeks on the design of the above project and outlined the current status of the project design.

4. The Team stated that the above Project aimed at improving the profitability, productivity and sustainability of land and water resources, through shared control of these resources, would probably be accepted by the USAID, but the finalization of the design would need confirmation of the Provincial/Divisional authorites that the Project is acceptable to them and they are willing to extend their support and implement project activities in the proposed watersheds.

5. The Chief Secretary stated that the project is acceptable as it is in line with government policy and the development programme now being implemented in the NCP. He welcomed the selection of the NCP as a pilot area for project operations and the Huruluwewa watershed as the initial geographical area in which to base project activities. The order of priority for subsequent selection of other watersheds in the NCP should be:

a. Mahakanadarawa
b. Mahawilachchiya
c. Naachchaduwa

6. The Chief Secretary and the Secretary to the Hon. Chief Minister explained a number of initiatives being alredy planned or undertaken in the NCP which are in line with the activities of the proposed project. Among these are :

a. The construction of agro-wells to assist crop production, particularly during the Yala season.
b. Re-forestation to conserve catchments.
c. Promotion of ratan growing and developing ratan-based industries
d. Promoting and developing granite products for export
e. Cultivation of fruits - lime, banana, cashew and mango under an integrated village development programme.
f. Promotion of handicraft from local raw material.

The project could build on or take advatage of the above programmes and assist the people and their organizations in their development efforts. The Project will, however, focus on development based on land and water resources.

7. The Chief Secretary drew the attention of the IIMI Team to the need for specifying the lines of authority and responsibility for project implmentation as between the line ministries and the provincial councils.

8. The IIMI Team assured the Chief Secretary that the organizational arangements that would be proposed for project implementation would address the above issue satisfactorily.

K.B. Sirisena
Chief Secretary,
North Central Provincial Council

Office of the Chief Secretary,
North Central Provincial Council
Anuradhapura.

Attachment 2

Minutes of the meeting held with the Chief Secretary, and other official of the Southern Provincial Council on the proposed GOSL/USAID Project for Shared Control of Natural Resources (SCOR).

The above meeting was held on 31st August 1992 from 4.30 p.m. to 6.00 p.m. at the office of the Chief Secretary.

2. The following were present.

Mr. Albert Ratnayake, Chief Secretary, SPC.
Mr. H.W. Wijeratne, Secretary, Ministry of Agriculture and Rural Development, SPC.
Mr. C. Ranasinghe, Land Commissioner, SPC.
Mr. R.S. Abeysekera, Director of Agriculture, SPC.
Mr. H.K. Weerasena, Assistant Commissioner of Agrarian Services.
Mr. S. Liyanage, District Forest Officer, Matara
Mr. I.K. Weerawardene,)
Mr. Anura Widanapathirana,) Consultants, IIMI/SLFO.
Mr. Paul Rajasekera)

3. The IIMI Team referred to the discussions they have had with the Chief Secretary, and also with other Provincial and Divisional level officials (at a Workshop at Koggala), during the past few weeks on the design of the above project. The Team outlined the proposed objectives of the SCOR project, its activities, outputs and expected benefits.

4. The Team stated that the above Project aimed at improving the profitability, productivity and sustainability of land and water resources, would probably be accepted by the USAID, but the finalization of the design would need confirmation of the Provincial/Divisional authorites that the Project is acceptable to them and they are willing to extend their support and implement project activities in the priority areas proposed.

5. The Chief Secretary stated that the project is acceptable as it is in line with government policy and the development programmes now being implemented in the SP. He welcomed the selection of the SP as a pilot area for project operations and the Nilwala watershed as the geographical area in which to base project activities. Initially, the sections of the watershed covering the Divisional Government Agents' areas of Kotapola/Deniyaya should be selected. As this watershed covers a very large extent of land, subsequent expansion of the projects' activity may be towards lower sections of the watershed covering the Divisional Government Agents' area of Pitabeddera.

6. The Chief Secretary stated that he would like to brief the Hon. Chief Minister on the proposed project. Mr. Chandra Ranasinghe, Provincial Land Commissioner was requested to prepare and present a brief note on the proposed project to the Hon. Chief Minister.

7. The proposed project organization was discussed in detail. The Chief Secretary stressed the importance of deploying catalysts to promote and develop user organizations around the different production activities to be undertaken in the watershed area.

8. It was agreed that some assistance by way of strengthening Divisional Government Agents' Offices would be most welcome.

Albert Ratnayake
Chief Secretary,
Southern Provincial Council

Office of the Chief Secretary,
Southern Provincial Council
Galle

31st August 1992.

Annex VIII

ENVIRONMENTAL ANALYSIS

The goal of the SCOR Project is to increase the sustainable productivity of the natural resources base in Sri Lanka in ways that will improve people's livelihoods beneficially and equitably with due regard to the environment. This goal will be achieved through increased sharing of natural resources management focusing on the total watershed as the basic planning and implementation unit. This focus itself will be an achievement as far as environmental protection is concerned since watershed approach is considered the most effective approach to environmental management (World Bank 1990). The project's goal will be achieved through the provision of technical assistance, training, commodity support and special projects, such as providing support to user groups to engage in productive activities.

Technical assistance (TA) will be in the form of support by Sri Lankan and expatriate specialists to help Watershed Resources Management Teams which will be established at the field level to undertake planning, actual implementation of income generating and environmental programmes and, evaluation. Through TA, it is expected to propagate environmentally friendly technologies and build environmental consciousness among various types of resources user groups, NGOs and other agency staffs. These will lead to significant improvement of the environment.

Under the SCOR Project, training will be provided to resources users and groups, NGOs, national and provincial line agencies and, provincial councils and divisional secretariats. This will help these partners to develop their ability to identify environmental problems and their capacity to handle environment-related problems in the future. Hence, it is expected that environmental protection measures that will be developed by the Project will continue even beyond the duration of the Project thus contributing toward sustainable development.

Commodity assistance will be in the form of IEC materials, teaching aids, computers and other similar equipment. The Project does not envisage building new structures nor the installation of heavy machinery. The equipment to establish natural resources information systems at different levels of decision making will improve users' understanding of the environment which will eventually help develop better knowledge and its application on the protection of the environment.

The Project proposes to provide special support to strengthen user groups and to get them involved in exploring new economic opportunities. Part of this support will be to provide income opportunities and employment for the youth, women and resources-deprived people. By doing so, their engagement in environmentally destructive activities such as poor and inappropriate land use, rampant felling of trees for income, etc., could be prevented. In the meantime, reforestation will improve environmental quality.

The Project's activities of the creation as well as strengthening of user groups, improving tenure of resources, support to NGO, private sector and governmental agencies and, improved coordination will have following impacts on the environment.

User group creation and strengthening (federations) will help improve users' knowledge and understanding of the status of different components of the watershed which has not taken place before. Organizing users operating in various parts of the watershed and encouraging them to form councils or federations will improve their coordination and protection of the natural resources in the area of their operation. These will significantly enhance the local environment and the trade-off in the downstream areas will improve the environment in those areas as well. The environmental impact resulting from the creation of specific economic activities will be assessed at the time of taking them up for implementation.

Improving resources use tenure may increase the area reforested; it might also permit users to plant and protect the forests above the reservoir to which they do not have any rights of access at present. These will significantly contribute toward the protection of the environment. Support to government agencies, NGOs and private agencies will facilitate the generation of more income and employment opportunities some of which may be even outside agriculture. This will help reduce the dependency on the land and relieve pressure on traditional modes of exploitation of land, water and forest resources. Improved coordination among agencies and projects will create an awareness about ongoing projects and programes enabling them to become familiar with environment-related development programes, and possibly to secure assistance through such programes to supplement their felt needs. Promoting discussion and dialogue among national and provincial staff together with the NGOs will facilitate policy and process reforms related to environmental aspects. These efforts will finally lead to a better environment.

The Project, therefore, will achieve significant improvements in the environment both by implementing environmental-friendly development programs in selected watersheds and by developing the capacity of user groups, NGOs and government agencies to handle environmental problems. Its efforts in integrating user groups with forest reserves for protection and use will lead to better livelihood for the users while protecting the environment. Hence, it may be concluded that the Project will upgrade the quality of the environment through investments on the vulnerable resources base and building capacity of the user groups to get involved in environmental protection aspects.

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OTHER DONORS' ACTIVITIES

Projects/Programs on Natural Resrouces Management in Sri Lanka Funded by Donor Agencies

There is a large number of projects and programs dealing with Natural Resources Management (Land, Water and Environment) funded by a number of donor agencies. These projects are implemented through four key ministries: the Ministry of Lands, Irrigation and Mahaweli Development, Ministry of Agricultural Development and Research, the Ministry of Environment and Parliamentary Affairs, and the Ministry of Policy Planning. At grassroot level, the implementation is handled by the respective line Ministries, Provincial Councils, Divisional Secretaries, and Nongovernent Organizations. Amongst the donors providing financial and technical assistance to these projects are USAID, NORAD, Netherlands, WHO, SIDA, CIDA, Community Aid Abroad, IFAD, EEC, ADB, and the World Bank. Counterpart funding for all projects are provided by the Government of Sri Lanka.

The identified projects/programs are those broadly dealing with water/irrigation, land, forestry, environment and agriculture. The project covers such areas like rehabilitation, new construction, restoration, reforestation, training, awareness creation and strengthening farmers' organizations. In addition to the ongoing projects, a number of other new projects too have been identified and are awaiting final approval by the donors or the government. These too have been included in the list.

	Project activities Title and No.	Source of assistance	Duration	Ministry/ Department	Term/Loan Grant/Fund	Total assistance in Rs.	Nature of activities
1.	Development and evaluation of mixed species plantation Hantane catchment area	NORAD	1990-1992	University of Peradeniya	Grant	600,000/-	Evaluation and development of mixed species plantation for the Hantane area.
2.	Under planting multiple use species in pinus plantation mixed	NORAD	1990-1992	University of Peradeniya	Grant	200,000/-	To examine the feasibility of conservation of pinus plantation to mixed species forest plants enriched with multiple purpose indigenous species through procedures in the Sinharaja buffer zone.

3.	Support to NGO	NORAD	1992-1993	NGOs and the Central Environment Authority	Grant	700,000/-	To encourage small local level environmental NGOs to participate actively in solving environmental problems at grassroot level by implementing the project together with government agencies.
4.	District environmental projects	NORAD	1990-1992	Central Envnmental. Authority	Grant	2 million	To develop the concept of integrated approach at regional and district level for protection and management of the environment and sustainable development.
5.	Mobilization of Community support for environment conservation	NORAD	1989-1992	District Environmental Agency/ Moneragala	Grant	1.6 million	To mobilize action by the community and the agencies to protect the environment.
6.	Conservation of mangroves	NORAD	1991-1993	Forest Department	Grant	2 million	To prepare a conservation management plan of the mangroves and recommend a legal framework for mangement.
7.	Safe use of pesticides fertilizer and industrial chemicals	NORAD	1990-1992	CEA	Grant	700,000	To establish a comprehensive data base on chemicals in order to exercise a control on import and use of hazardous chemicals in the country.
8.	Environmental awareness creations - 1992	NORAD	1992	CEA	Grant	1.3 million	To improve the envnmntal. awareness among school children local-level officials and the public.
9.	Environmental protection and management Phase II	NORAD	1989-1991	CEA	Grant	5.9 million	To undertake surveys and research in relation to aspects of envmntl. degradation and to develop criteria for protection and improvement of envment.
10.	Preparation of sectoral plans on the basis of the National Conservation Strategy	NORAD	1990-1991	CEA	Grant		To develop the action plan to incorporate recommendations of the National Conservation strategy into environmentally sound development policies.
11.	Strengthening the role of environmental NGOs and the Public Agencies	NORAD	1990-1992	NGOs	Grant	721,000	To support local NGOs engaged in activities connected to environment protection management and awareness creation.

12.	Victoria Land Use Mapping Project	ODA	1992-1993	MEA	Grant	518,000	Soil conservation and watershed protection and modification of present land use.
13.	Upper Mahaweli Watershed Management	GTZ/GOSL	1990-1993	MEA	Grant	4 million annually	Balance development of water, land and human resources on a suitable basis in the upper Mahaweli catchment area.
14.	Forestry Sector Development Project	IDA/World Bank, ODA FINNIDA/ UNDO/FAO	6 years 1990-1996	MLI&MD	Grant	9.3 million	Forestry Development.
15.	Participatory Forest Project	ADB	6 years 1993	Forest Department	Loan	10 million US$	Continuation of community forestry project.
16.	NORAD environment a.Sinharaja Conserv- ation Project	NORAD	Phase I 1989-1992	CEA/ Forest	Grant	9.3 million	To conserve the forest area through an integrated approach.
	b.Knuckles Project		1989-1992	Forest	Grant		
17.	IRDP Forest Components a. Hambantota	NORAD	1980	Ministry of Plan Implmtion.	Grant	18.6 m	Extension of forest cover through planting conservation and awareness creation.
18.	b. Kalutara environment/forestry	FINNIDA	1988	-do-	Grant		- do -
	c. Moneragala	NORAD	1988		Grant		
19.	Forestry/Land Use Mapping Project	ODA	Phase I 1992	ODA	Grant		
20.	Major Irrigation Rehabilitation Project (Kantalai, Morawewa, Iranamadu, Giants'Tank, Rajangana, Nachchaduwa, Huruluwewa)	IDA, CDA, SDC	1985-1992	IMD	Loan/Grant	513.3 m	Rehabilitate existing irrigation systems integrate management and strengthen support services.
21.	ISMP (Irrigation systems Management Project)	USAID	1987-1993	IMD	Loan/grant	503.2 m	Formation of FOs physical rehabilitation Training Research on Policy Issues on irrigation rates.
22.	North Western Province Irrigation Rehabilit- ation Project	EEC	1990-19957	ID/ Provincial Council	Grant	337 m	Rehabilitation and assistance to farmers.
23.	NIRP (National Irrigation Rehabili- tation Project)	EEC/IDA	1991-1997	ID	Loan/grant	2009 m	Rehabilitate 1,000 minor and 60 medium irrigation schemes estb. of FOs, training of farmers and FOs.

24.	Kirindi Oya Project Phase I and II	Phase I ADB, IFAD, KFW Phase II ADB	1978-1993 1987-1993	ID	Loan	Phase I - 1925 m Phase I - 943.4 m	Construction of dams, and irrigation facilities.
25.	Minipe Nagadeepa Rehabilitation Project	OECF (Government of Japan)	1988-1995	ID	Loan	505 m	Rehabilitation of irrigation infrastructure community development programs.
26.	Walawe Irrigation Improvement Project	ADB	1985-1992	MASL	Loan/grant	1905 m	Irrigation improvement roads, water supply adaptive research.
27.	Improvements and rehabilitation of irrigation scheme, Hambantota	NORAD	1990-1993	Line Departments Hambantota District	Grant	26 m.	Irrigation rehabilitation Pattiyapola Mahawewa. Kattakeduwa wewa Meegahagandura wewa Marakkola anicut.
28.	IRDP Hambantota II	NORAD	1991-1995	ID Agrarian Department	Grant	50 m	Tank construction formative of FOs and Farmer Training.
29.	Small Tank Restoration Project	CAA	1992	Central Small Tank Restoration Society	Grant	2 million	Restore small abandoned tanks.
30.	Land Use Policy Planning	ADB	1987-1993	Land Use Policy Planning Unit of MLI & MD Survey Dept. and ID	Loan	612 million	Strengthen Land Use Planning Unit, Land data base estb. digital mapping and geographic data base, National soil Survey, Prepare Land Use Plans for Provinces.
31.	Mahaweli System C Zone 3-6	IDA OECF JICA APAED	1991-1993	MASL	Loan/grant	10.007 m	Construction of irrigation infrastructure
32.	Mahaweli Development Project System B Left Bank	USAID OPEC ADAB EEC UNICEF CIDA	1981-1994	MASL	Loan/grant	12,807 m	Irrigation and social.
33.	NORAD Environmental Cooperation Programme	NORAD	1989-1993	CEA NGOs	Grant	120 m	Infrastructure on form development.
34.	Badulla Rural Development Project	IFAD	1983-1992	IRDP-through line Departments	Loan	369.5 m	Rehabilitation of small holder plantation crops irrigation schemes and agricultural support services.

35.	Anuradhapura Integrated Rural Development Project for sustainable agriculture production systems	SIDA	1992-1995	IRDP-through line Departments and Divisional Secretaries	Grant	100 m	Tank rehabilitation catchment area conservation agro-forestry livestock; development introducing alternative farming for chena.
36.	N.W. Province Dry Zone Participatory Development Project	IFAD GTZ	1993-2000	Ministry of Policy Planning and Provincial Councils	Grant/loan	686 m	Rehabilitation of 300 minor tanks. Construction of 500 agro-wells. Center for participatory in-training land regularization, intergration of women into mainstream of agricultural rural life.
37.	Improvement and rehabilitation of irrigation schemes Tissamaharama Division of Hambantota District	NORAD	1991-1993	ID	Loan	8.4 m	Irrigation rehabilitation farmer training in water management.
38.	Southern Area Rural Development Project	ADB	1992-1999	Line Department	Loan	1968 m	Rehabilitation irrigation and drainage schemes (southern province).
39.	Project for optimum water resources utilization in Monaragala (POWRUM)	Japanese	Not finalized	ID	Loan/grant	320 m	Irrigation constructions.
40.	N.W.Province Water Resources Development Project	ADB	1992-1998	ID/Provincial Council	Loan/grant	1600 m	Improvement restoration rehabilitation of existing projects tube wells/ dug wells and on farm management.
41.	Uma Oya Multi Purpose Project	ADB	Not yet finalized	CEB	Loan	10.7 b	Provision of irrigation facilities to 10,200 hos and generation of electricity.
42.	Wet Lands Conservation Project	Netherlands	1991-1993	CEA	Technical assistance	-	Determination of boundaries and of biological and ecological value of wet lands.Identification of threats, design criteria for protection and implementation of awareness program.
43.	Natural Resources and Environmental Policies Project (NAREPP)	USAID	1991-1998	Ministry of Policy Planning & Impl. and Ministry of Environ. & Parliam. Affairs	Grant	656 m	Natural resources management special projects impact management and assessment, public education and participation.

44.	Walapane Environmental Programme	CAA (Community aid abroad)	1991-1193	Walapone Environment Council	Grant	854.720	Development of envirnmt. and strengthening capacities of the community in Walapone.
45.	South East Dry Zone Regional Development	UNDP	Not finalized	Ministry of Policy Planning & Implmntion. through line ministries	Grant	250 m	Rain-fed upland farming forestry development and infrastructure development.
46.	Strengthening the role of environmental NGO and NORAD public agencies	NORAD	1990-1992	NGOs	Grant	721,000	Financial assistance to NGOs for activities on environmental protection management and awareness creation.
47.	Hambantota IRDP Eastern Medagama Madulla Agricultural Extension Area Development Project	NORAD	1991-1995	Line departments	Grant	9 m	Provision of soil conservation strategies demonstration plots assistance for export crops.
48.	Up Country Peasantry Rehabilitation Project	EEC	1993-1998	Department of Upcountry Rehablitn.	Loan	253 m	Irrigation facilities roads. drinking water, improvement to schools etc.
49.	Monaragala Irrigation and Peasantry Rehabilitation Project	EEC	1993-1997	Department of upcountry Rehabilitation	Loan	328 m	Rehabilitation irrigation schemes farmer training crop diversification implementation of environmental and conservation programs.
50.	Soil conservation and scientific crop diversification as a strategy for income generation	CAA	1991-1992	NGO	Grant	595,930	Soil conservation crop diversification improvement to living standards.
51.	Kegalle Rural Development Project	IFAD	1986-1993	IRDP-through Line departments	Loan	409.1 m	Small-holder tea sector development minor export crop development small-scale industrial development.

Annex X

PERFORMANCE DISBURSEMENT CRITERIA AND BENCHMARKS

The basic principles of performance disbursement are discussed in 4.1 in the body of the Project Paper. Here are some applications of these principles in operational terms, followed by a set of benchmarks that could be used for guiding and monitoring Project implementation.

1.	Establishment and operation of WRMTs Pattern:	Amount (in %)	Year
	Regulations for WRMG drafted and approved	20	1
	WRMG established	10	2
	WRMG action	60	2-6
	WRMG evaluated	10	6
2.	Capacity building at national, provincial and divisional levels Pattern:		
	Agencies to benefit are identified	10	1
	Capacity-building plan drafted and approved	20	1
	Capacity-building plan implemented	60	2-4
	Capacity-building plan evaluated	10	5
3.	Legal, regulatory and process reform Pattern:		
	Terms of References for studies drafted & approved	10	1
	Studies completed	10	2
	Reform implemented	70	3-4
	Outcome evaluated	10	5

Illustrative Allocation of Performance Disbursements among Activities
(amounts in $US 000)

S T A G E

Category	Total	1	2	3	4	
WRMG	4000	800	400	2400	400	
50% of total	20%	10%	60%	10%		
Capacity-building		2000	200	400	1200	200
25% of total	10%	20%	60%	10%		
Reform	2000	200	200	1400	200	
25% of total	10%	10%	70%	10%		
Total	8000	1200	1000	5000	800	

Y E A R

Yearly flow	1	2	3	4	5	6	
WRMG	800	880	480	480	480	880	
Capacity	600	400	400	400	200	0	
Reform	200	200	700	700	200	0	
Total		1600	1480	1580	1580	880	880

Share by level	National		Provincial		Divisional		Local
WRMG 20%		10%		20%		50%	
Capacity	40%		30%		20%		10%
Reform 60%		40%		0%		0%	

Division of disbursements by level and by year

	YEAR						
	1	2	3	4	5	6	Total
National	520	456	676	676	296	176	2800
Provincial	340	288	448	448	188	88	1800
Divisional	280	256	176	176	136	176	1200
Local	460	480	280	280	260	440	2200
Total	1600	1480	1580	1580	880	880	8000

Benchmarks for GSL, PC and DS performance

Performance disbursements are assumed here to be made in return for government actions, not for overall project progress. This means that if the project succeeds without, or in spite of the lack of, government participation, the government should not receive budget support. The following illustrate benchmarks that could be formulated and agreed on.

Benchmarks by SCOR activity area

1. Strengthened user groups
   - c. Legal status and powers
     - Regulations and laws drafted, passed and implemented
   - h. Support services
     - Enabling regulations for private input/output marketers and banks drafted, passed and implemented
     - Government line agencies belonging to WRMTs meet expected performance during project implementation

2. Improved tenure arrangements
   - a. Modification in regulatory and legal mechanisms
     - Legal/institutional research designed and carried out
     - Gaps, overlaps and inconsistencies of land tenure laws rectified
     - Need for Registration of Title Act versus reinforcement/modernization of Deeds Registry
     - Needs assessment of Survey Department, Land Commissioner's Department, Agrarian Services, etc.
     - Needs assessment of civil courts system re its handling of land-related cases
     - Necessary legal/institutional changes drafted and implemented

c. Policy and process reforms
   - Research on effects of tenure arrangements on productivity and sustainability designed and carried out
   - Rationalization of chain of responsibilities for titling programs
   - Shift from reactive process of regularization of encroachment to active process of resettlement

d. Issuance of land titles
   - Support to Survey Department and other agencies whose lack of resources represents constraint on rate of titling
   - Support to Registry of Deeds and/or new Registry of Title needed to streamline them and enhance their accessibility

e. Land consolidation
   - Simplified legislation regarding production companies drafted, passed and implemented
   - Land Commissioner's Department and the Department of Agrarian Services conduct consolidation exercises in pilot watersheds with user groups

3. Strengthened capabilities
   a. Information systems
      - Mechanisms for sharing of data among departments and agencies established

   b-f. Training
      - Numbers of government employees taking part in training, with proviso that they be reassigned to posts where training will be used

4. Improved coordination and linkage
   b. Watershed land use plans
      - Participation of LUPPD, Agriculture, Forestry, and Lands in WRMG with user groups' federations in land-use planning exercises

   c-d. Coordinating mechanisms
      - Steering committees established in areas of concern to the project, composed of representatives of appropriate agencies.

Annex XI

LIST OF CORE GROUP MEMBERS

Mr. L.U. Weerakoon, Secretary to State Minister for Irrigation
Mr. O.C. Jayawardena, Secretary, Project Ministry of Lands and Land Alienation
Mr. D.M. Ariyaratne, Director, Irrigation Management Division, MLI&MD
Mr. S. Berugoda, Director, Land Use Policy Planning Division, MLI&MD
Mr. S. Wickremaarchchi, Land Commissioner
Mr. A. Gunasekera, Director, Water Resources Development Division, MLI&MD
Mr. K. Yoganathan, Director of Irrigation
Dr. R. Wanigaratne, Head, Planning and Monitoring Unit, Mahaweli Authority of Sri Lanka
Dr. S. Somasiri, Head, Land & Water Management, Department of Agriculture
Mrs. G.K.C. Wijeratne, Commissioner of Agrarian Services
Mr. V.K. Nanayakkara, Secretary, Ministry of Environment and Parliamentary Affairs
Mr. U.G. Jayasinghe, Government Agent, Polonnaruwa
Mr. C. Ranasinghe, Provincial Land Commissioner, Southern Province
Prof. M. Karunanayake, Prof. of Geography, University of Sri Jayawardenapura

DESCRIPTION OF NORTH CENTRAL AND SOUTHERN PROVINCES

North Central Province

The North Central Province consists of two districts with a total land area of 10,382 sq.km including inland waters. This is 16 percent of the total land area of Sri Lanka. Of the two districts, Anuradhapura has 509 sq. km of large inland waters while Polonnaruwa has 213 sq. km (Central Bank 1990). The area under the large inland waters in North Central Province is one fourth of the total area under inland waters of the island. The North Central Province is well-known for its ancient irrigation systems which formed the foundation for a hydraulic civilization. At present, Anuradhapura alone has 73 irrigation schemes which have a command area more than 40 ha. This is about 14 percent of 521 such irrigation schemes in the country (National Atlas of Sri Lanka 1988). In addition to the old irrigation work, a considerable part of the province greatly benefits from the recently started development attempts such as the Mahaweli Development Project.

The North Central Province is predominantly an agricultural area with 1.02 m people of whom the majority draw their main income from rice cultivation. The area cultivated to rice crops in 1990 amounted to 1.23 million ha. In this thinly populated province population density was 99 per sq. km in 1990 (Central Bank 1990). From 1980 to 1990, population of the province has increased by 19.9 percent. According to the 1981 census, more than 90 percent of the population lived in rural areas.

In the North Central Province, the climate is typically tropical with maximum and minimum temperatures of 31.9^0 C and 23.1^0 C respectively. The mean temperature is 28^0C. The annual average rainfall is less than 1,355 mm (Census Department 1990). The average number of rainy days is 77. The province receives rainfall with a bimodal pattern. The bimodal pattern of rainfall characterizes two main cultivation seasons. During the maha (wet) season rainfall occurs from October to mid-January, providing about two thirds of the annual total rainfall on the province. The yala (dry) season receives only about 30 percent of the annual rainfall. It occurs mainly from mid-March to mid-July. Consequently, the province has to depend on irrigation waters for its cultivation during the two distinct dry periods of the year.

The North Central Province mainly contains Reddish Brown Earths, which are suitable for subsidiary food crops with irrigation in the dry season with or without supplemental irrigation in the wet season. The NCP belongs to the Dry Zone Low Country 1 Agro Ecological Region. Forests cover an area of 3,208 ha.

The majority of major irrigation settlement schemes belong to the North Central Province, where infrastructure has been developed over the years to meet the requirements of settler families. A branch of a reputed bank in the province services about 16,385 people. The total

number of branches of banks in the province amounted to 64 in 1990 (Central Bank 1990). The total length of the road network in the province is 6,484km.

Southern Province

The Southern Province has a total land area of 5,491 sq. km and its coastal boundary cut across Galle, Matara and Hambantota districts. The Southern Province has only 159 sq. km of inland waters of which 111 sq. km are confined to Hambantota District. This includes ancient irrigation works, such as Tissa Wewa and the recently built reservoirs, such as Kirindi Oya.

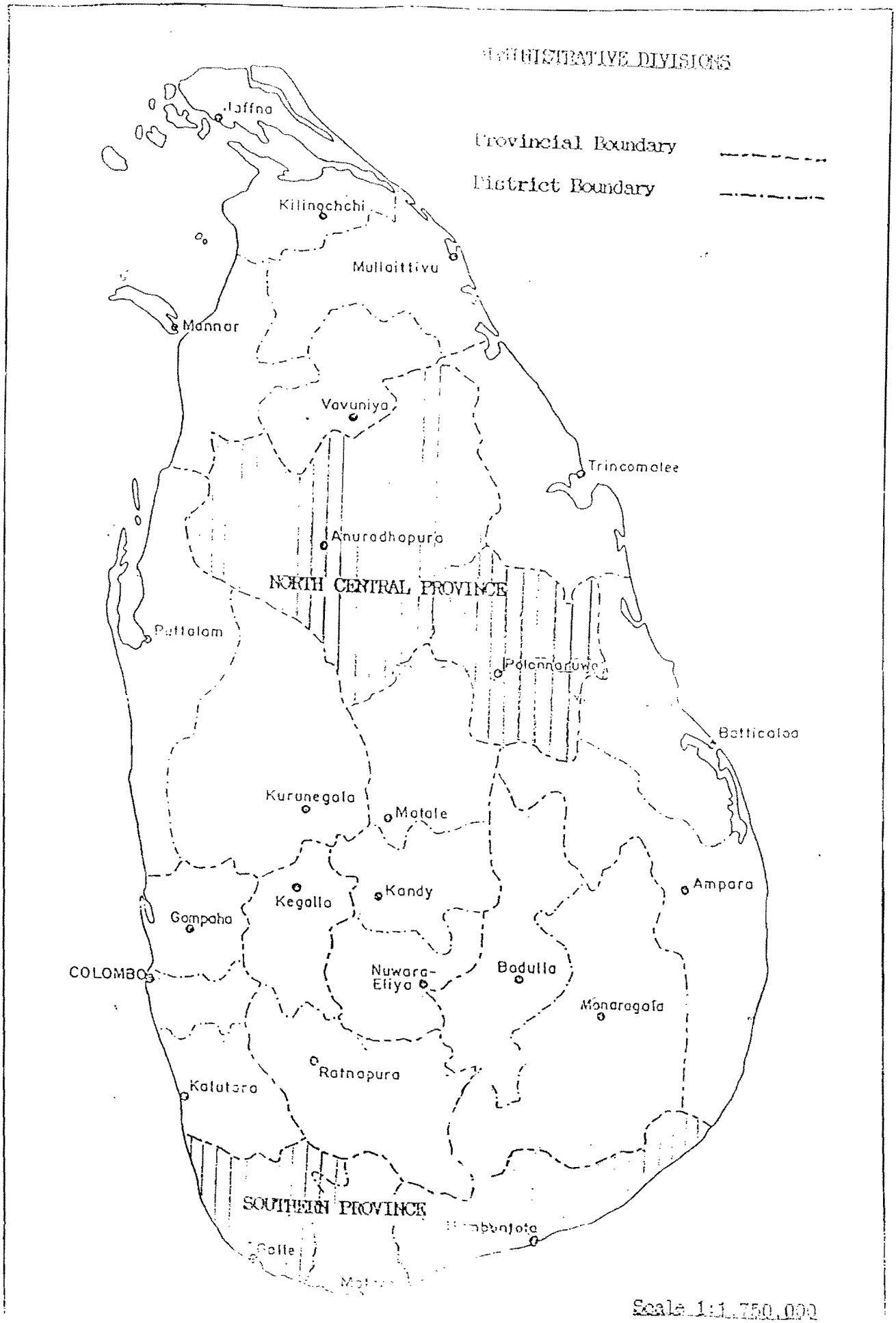
The Southern Province, with a population 2.2 million is naturally densely populated (Central Bank 1990). The population density is 467 people per sq.km. According to the 1981 census, 14, and two percent of the population lived in urban areas and estates and the rest lived in rural areas.

The southern plains in Galle and Matara districts, which occupy more than half of the lands in the province, receive more than 2,000 mm annual rain fall and belong to the wet zone. The average number of rainy days in these two districts is about 145. The mean temperature of Galle District is 27.3^{0}C. Hambantota District whose annual average rainfall is around 1,068 mm belongs to the dry zone and its mean temperature in 1990 was 27.7^{0}c and the number of rainy days was 65 (Central Bank 1990).

Agriculture in the Southern Province consists of two sectors: plantations with tea, rubber and coconut; and the peasant sector with rice cultivation. About 107,000 ha of lands which spread over the province, were cultivated to the rice crop in 1990. The areas under tea, rubber and coconut in 1990 were 36,200, 22,230 and 16,400 ha respectively in 1990. Moreover, farmers in the Southern Province have grown minor export crops in 13,272 ha. Also, about 879 sq. km of lands in the province are under forests.

The Southern Province consists mainly of Bog and Half-Bog soils which occur in coastal landscape and Red-Yellow Podzolic soils which are fine-textured, strongly acid soils on less steep slops of mountainous terrain. With adequate erosion control measures these Red-Yellow Podzolic Soils can be used for tea plantation. Bog and Half-Bog soils are suitable for rice cultivation. The Southern Province has lands that can be categorized into three major agro-ecological zones in Sri Lanka viz. (a) Wet Zone (b) Intermediate Zone and (3) Dry Zone. The sub-division of the three major zones into regions is done based on the amount and distribution of rainfall, elevation and soils. Accordingly, the Southern Province can be sub-divided into ten out of 24 agro-ecological zones that have been identified in Sri Lanka.

In 1990, there were 100 bank branches in the province. This means that each branch serves about 22,000 people. The total length of the road network in the province is about 2,214 km.


ADMINISTRATIVE DIVISIONS
Provincial Boundary
District Boundary
Jaffna
Kilinochchi
Mullaittivu
Mannar
Vavuniya
Trincomalee
Anuradhopura
NORTH CENTRAL PROVINCE
Puttalam
Polonnaruwa
Batticaloa
Kurunegala
Matale
Kegalla
Kandy
Ampara
Gampaha
COLOMBO
Nuwara-Eliya
Badulla
Monaragala
Ratnapura
Kalutara
SOUTHERN PROVINCE
Hambantota
Galle
Scale 1:1,750,000

Annex XIII

DESCRIPTION OF THE WATERSHEDS SELECTED IN THE NORTH CENTRAL AND THE SOUTHERN PROVINCES

The purpose of this Annex is to provide a description of the Huruluwewa watershed in the NCP and the watershed covering the Nilwala River Basin in the SP. The description focuses on the geography, human resources including organizations, physical features, the present development programs and potentials, and the main constraints hindering the development of natural resources in the two watersheds. The information contained in this Annex is a result of the discussions held by the Core Design Team with the relevant officials and the resources users in the two provinces, review of the relevant documents and making actual field observations by the Design Team. Discussions were held with the two Chief Secretaries and the provincial officials representing agriculture, forestry, land, agrarian services and irrigation in the two provincial councils and field staffs operating in the Divisional Government Agents' office areas of Galenbindunuwewa and Palugaswewa in the NCP and Kotapola and Pitabeddara in the SP.

Description of the watersheds will be focused on the following points:

1. Physical and ecological aspects
2. Human resources and organizations
3. Infrastructure including government services
4. Ongoing development programs
5. Conclusions

The description will start with the Huruluwewa watershed followed by the Nilwala watershed.

A. HURULUWEWA WATERSHED

Huruluwewa Watershed: Physical Features

The Huruluwewa watershed is located in the low-country dry zone agro-ecological region of the North Central Province of Sri Lanka. It is located within the district of Anuradhapura. This watershed is under two DGA's Divisions namely, Galenbindunuwewa which covers the command area, the drainage area and part of the catchment and reservoir of Huruluwewa and, the DGA's Division of Palugaswewa which includes the major part of the Huruluwewa catchment. The upper watershed of Huruluwewa extends beyond the NCP, even up to Matale District from where the Kandalama feeder canal provides Mahaweli water to the Huruluwewa Reservoir (see Map 1 annexed).

TABLE 1.
AREA PLANTED, CATCHMENT INFLOW AND MAHAWELI DIVERSION
TO HURULUWEWA IRRIGATION SCHEME

SEASON	ACERAGE	CATCHMENT INFLOW (AC.FT)	MAHAWELI DIVERSION (AC.FT)	SLUICE ISSUES (AC.FT)	RAINFALL (DURING ISSUE PERIOD) (IN INCHES)	SEASONAL RAINFALL (IN INCHES)
82 Yala	9552	-	16,695	11,338	7.36	16.6
82/83 Maha	9552 Paddy	10,200	12,725	16,857	45.25	45.25
83	4000 OFC	-	8,875	5,791	14.86	14.86
83/84	9552 Paddy	27,300	19,900	9,685	81.76	51.76
84	9552 Paddy	-	10,200	52,600	Rain gage not in order	Rain gage not in order
85 Maha	9552 Paddy	18,200	8,600	21,139		
85 Yala	-	-	-	-		
85/86	9552 Paddy	54,800	11,328	47,659	26.68	26.68
86 Yala	2500 OFC	-	3,221	8,369	4.01	4.01
86/87	9552 Paddy	7,420	28,054	45,057	19.56	19.56
87	1600 OFC	-	673	6,059	6.09	6.09
87/88	9552 Paddy	8,600	29,086	28,496	13.31	30.86
88	0	-	-	-	10.4	15.52
88/89	0	5,750	12,811	-	3.74	25.33
89	1250 Paddy 1250 OFC	1,414	3,388	20,366	15.78	20.97
89/90	0	-	-	-	15.57	47.61
90	9000 Paddy	24,000	10,000	46,139	17.53	23.08
90/91	9552 Paddy	4,500	19,435	32,979	7.31	12.65
91	-	250	-	-	4.76	
91/92	9552 Paddy	19,100	11,341	36,555	25.13	25.13

SOURCE: RECORDS, IRRIGATION ENGINEER'S OFFICE, HURULUWEWA

In this area, the average annual rainfall is about 50-75 inches which has a bimodal distribution. The north-east monsoon brings in about 85 percent of the rain from November to January. The May-August period is very dry. The average temperature is about 80 F.

Watershed Components and Status

The watershed has four main components namely, catchment, reservoir, command and the drainage area. The catchment is 77 sq.miles which is located mainly in the Palugaswewa DGA's Division while a small portion lies within Galenbindunuwewa. It is badly degraded mainly due to chena farming. Most of the forest now is of scrub jungle type. Because of this destruction, tank inflow has been reduced in the recent years. The Design Team saw a large number of chena fields in this season within the catchment. Some chenas are still being burnt including a large number of well-grown trees. Economic products from the catchment are limited since there had not been any program aimed at the propagation and establishment of economically important plants in the catchment. About 10 smaller tanks are located within the catchment and their rehabilitation in the recent past has resulted in more water being retained in small tanks and, consequently, the amount drained into Huruluwewa Reservoir has diminished over the years (see Table 1). This is another factor for the low level of water in the reservoir.

The land use in Huruluwewa watershed is shown in Map 2.

Huruluwewa Reservoir is constructed by damming the Yan Oya. It has a capacity of 55,000 ac.ft. with a depth of 27.5 ft. The last time the tank spilled was in 1983/84. At present, it has only a dead storage. At present, the inflow is augmented by the Mahaweli diversion at the rate of 150 cusecs per day. However, less than 40 cusecs reach the reservoir while a greater part is tapped along Kandalama feeder canal including Yan Oya where people are tapping water illegally for irrigation which otherwise should have reached Huruluwewa Reservoir. A large number of siphons and some water pumps (as much as 3,000 2" pumps and 4" siphons) are used to siphon the water from this canal to 'illegal' rice and highland areas. The area cultivated by these illegal water users is about 5,600 acres. Water use in this area is very high and waste is also high.

The inadequate tree cover in the catchment encourages soil erosion which is finally deposited in the reservoir. There are no studies regarding the extent of siltation of the reservoir. The reservoir is rich in fish and several fishermen are engaged in fishery. They have formed themselves into a fishermen's society.

The designed command area of Huruluwewa Scheme is about 3,532 hectares while the present figure is close to 5,000 hectares which includes two medium-scale tanks currently fed by the Huruluwewa Reservoir. Water duty in last Maha was 3.8 ac.ft. while the normal figure is about 5 ac.ft. It should be noted that in "Sri Lankan standards," this represents a high degree of water use efficiency. However, there is a significant amount of water collected back in the Yan Oya through drainage. Hence, the water use efficiency may be further improved in Huruluwewa command. According to the technical assistant (TA) of the Irrigation Department

(ID), some farmers have the habit of impounding water in view of the uncertainty in the supply. The excess is drained down to Yan Oya. Here, the farmers' organizations (FOs) can be more effective.

Along the course of Yan Oya which is the natural river, there is a series of pick-up anicuts from which the drainage is re-used for agricultural production.

Human Resources and Organizations

Galenbindunuwewa and Palugaswewa are two of the poorest DGA's Divisions in the NCP. People are feeble and desolate. Huruluwewa Scheme in particular reflects a poor status of development mainly because of lack of irrigation water in spite of the presence of a large irrigation scheme which is supposed to be have augmented with Mahaweli diversions.

Because of the above state of affairs, the two DGAs are keen in selecting such a poor and difficult area for development under the SCOR Project wherein the natural resources base is vast but is being degraded.

In 1953, when the scheme was restored, it had 4,200 farm families which number has now increased to about 12,000. The population of Galenbindunuwewa DGAs Division is 43,234 (estimate for 1991). It must be noted that not all these people live within the Huruluwewa watershed earmarked to be taken up by the SCOR Project. The population is settled in 49 villages and 116 **ola gams**. In Palugaswewa AGA division the present population is 12,513 which is settled in 36 village clusters. Since this division includes only the catchment area of Huruluwewa, the population which may be directly affected by this Project may be smaller compared to the former DGA's Division.

Chena farming is the main occupation of the people in the area. This is done mainly in the catchment of Huruluwewa which is, therefore, badly dilapidated. The next source of employment is farming in major and minor irrigation schemes located within this watershed. The majority of the population belongs to the poverty group since 7,408 families in Galenbindunuwewa receive food rations. In Palugaswewa division, 1,874 families receive food rations and 1,648 families are the recipients of Janasaviya assistance.

There are many people's organizations now operating within this watershed. Of this, the farmers' organizations established under the Integrated Management of Irrigation Systems (INMAS) Programme of the MLIMD are the most active types of organizations. It should be highlighted that these organizations operate effectively even though the system is one of water deficit. These organizations are confined to the irrigated command area at present.

The FOs have undertaken two exciting activities. First, they have attempted to form a joint organization of users involving the farmers in the command and upstream areas. The upstream area consists of a 22-mile long Kandalama feeder canal and Yan Oya (see Map 1) which delivers Mahaweli waters into the Huruluwewa Huruluwewa from the Kandalama

bifurcation point. A large number of farmers and businessmen tap this water before reaching Huruluwewa. This includes some 3-4 farms with a size exceeding 100 acres where rice and other crops are cultivated. The soils are rich and water is abundant. Unhusked yields are as high as 150 bushels per acre. The illegal users are very strong and have even threatened the staff of the Irrigation Department who tried to confiscate the illegal crossings. A decision was taken to establish FOs among the farmers who use water by illegal means. They were invited to a meeting of the Project Management Committee (PMC) of Huruluwewa and were given an opportunity to interact with the members of FOs. It was only then that these farmers came to know of the plight of downstream farmers who face severe problems without having adequate water. It was noted that these farmers illegally use too much water with rates as high as 8 ac.ft. whereas the settlers use about 3 ac.ft. Their rice areas are fully submerged; excess water is used to irrigate highlands and even coconut lands. Upon hearing that downstream farmers do not have water even for drinking, they have decided to cooperate with the settler farmers and to reduce water use by planting short-aged varieties and to cut down on irrigation itself. To promote the formation of the users' organizations along the Kandalama feeder canal, 6 Institutional Organizers (IOs) have been placed in this area.

Second, a start has been made to develop a mechanism to coordinate activities between the farmers who acted legally and illegally. In this respect, the most exciting activity is the initiation of a joint- Kanna meeting involving both sets of farmer groups. The "illegal" farmers have no Kanna meeting while the "legal" ones are expected to attend them and follow their decisions. This is considered as a novel idea not reported in irrigation systems in the country before.

It should be highlighted that the FOs have already started to perform a wide range of activities. Some important activities among many more are briefly described below:

a. **Marketing agent**: One distributary canal organization (DCO) (Nikawewa DCO) is registered as the marketing agent for unhusked seed paddy with the Department of Agriculture. In, 1991/92 Maha season, the DCO has sold, unhusked rice to the value of Rs.98,000 utilizing its own funds and has made a profit of Rs.12,000.

b. **Provision of credit**: Loans are issued to membership through DCOs. This is highly beneficial since the majority cannot obtain loans from the banks since they have no collaterals. Kokawewa DCO has given loans to members at a monthly interest rate of 10 percent when the private lending rate is 20 percent per month. Out of this, 5 percent is retained with the DCO as a commission while 5% is given to the members who take the trouble in disbursing loans and recovering them. These loans are granted as cultivation loans, agro-well construction and to purchase water pumps, etc.

Kokawewa DCO has already granted personal loans amounting to Rs. 43,500 to its members. They have initiated various formalities to recover loans including the development of contacts with the Police and members of Mediation Boards. It has also

designed agreement forms for loan transactions which indicate the formal nature of their business.

c. **Registration as a business firm**: A federation of all the 13 DCOs is formed which has just applied to the Registrar of Companies for formal registration. It is planning to enter into actual business work thereafter. It grants membership to DCOs upon payment of Rs.1,000 as membership depending on the number served by the DCO. Some small DCOs are given the membership for Rs.500.

This idea was introduced to them by the few FRs who were sent on a study tour in Thailand.

d. **Bee-keeping**: Eighteen youths were sent to Bandarawela for a training on bee-keeping. Upon completion of the training, one youth has started to make bee boxes for which there is a high demand. The selling price is Rs.225. The DCO has given a loan to this person to start the workshop. The main problem is lack of planks since timber felling is prohibited.

About 3 DCOs are engaged in bee-keeping and the monthly yield is about 3 bottles per DCO. A bottle is sold at Rs.60 and the small quantity does not permit sale outside the scheme. During the dry season, they also face the problem of absconding swarms of bees which is perhaps a result of over-heating aggravated by lack of tree cover.

e. **Rice packeting**: Members of some DCOs were given a training on rice parboiling at the Rice Processing Development Centre (RPDC). The aim is to mill unhusked rice nd packet it for the market. The bank has agreed to grant a loan of Rs.30,000 to purchase the rice mill. This was however, granted in the name of its President and not to the DCO. The Three-phase electricity was supplied there only very recently which was another reason for not starting the mill yet.

f. **Soya products**: Huruluwewa is famous for soybean production. In collaboration with and assistance of the Plenty Canada, an NGO, some women were trained in the utilization of soya products in its Madatugama centre. Six DCOs are processing soya into dhall, soya dry fish soya milk (substitute for coconut milk). There is a good demand and for soya products locally.

In the meantime, the female IOs have trained some women to make soya dhall, at home.

g. **Agro-wells**: The Agricultural Development Authority (ADA) has a program to help farmers in constructing agro-wells in highlands. They give a subsidy of Rs.20,000 per well. The DCO in track 6 is severely hit by lack of water. Last Maha there was a crop failure from 1,000 acres. The DCO had discussions with the ADA and convinced the authority to help it in providing agro-wells. The ADA does not provide this facility to farmers in major schemes as it is confined only to minor schemes. But this DCO has

been able to convince the ADA and already 16 wells are in operation. Since the well was given to the farmers through the persuasion of the DCO, the 30 members who benefited had given Rs.1,000 each to the DCO as a donation. Out of these wells, only one has some water problem since it is shallow and is located in a difficult area.

Additionally, 152 agro-wells have been constructed by the DCOs through the loans of Rural Regional Development Banks. The loan is for Rs.30,000 per well. It is constructed by hiring a machine at a cost of Rs.1,650 per hour. The well can be constructed in 4 hours. This process was catalyzed by the Project Manager and his staff.

h. **Fertilizer trade**: In the project area there are 8 fertilizer stores constructed by the Department of Agrarian Services (DAS) through the Major Irrigation Rehabilitation Project (MIRP) funds. These were handled by the Cultivation Officers and the Grama Niladharis (GNs). Although there had been protection, and the gates and doors were robbed. Some of these had been constructed poorly. In the meantime, fertilizer was stored at the PM's complex. The visiting IBRD mission had discussions with the DCOs and the latter had explained the lack of stores to the DCOs. They also pointed out the state of 8 stores constructed, but not utilized, up to now. The IBRD mission had in turn requested the DAS to hand them over to the DCOs which was done an year ago. The DCOs have undertaken small repairs amounting to Rs. 400 - 500 per store out of its own funds. They were requested to pay a monthly rental of Rs.50 to the DAS which they have been paying for the last one year. The remaining store has not yet been handed over since it has several major repairs. The DCO is negotiating with the DAS to rent this out and to set off monthly rental against the amount the DCO has to incur on its repair.

DCOs have also been engaged in the sale of fertilizer. Last season, they had invested Rs.600,000 on fertilizer which was obtained at a commission of 10 percent. The DCOs did not keep much profits from the fertilizer trade since their objective was to provide fertilizer at the lowest cost to farmers. A 50-kg bag was sold at Rs.480 when the market price (including the price of the co-ops) was Rs.515 per bag. This finally forced the traders to sell fertilizer at a lower price.

i. **Road maintenance work**: DCOs had undertaken to maintain roads within the settlement. The agreement was signed with the Lands Commissioner (LC) and they did the work through shramadana and through their own reserve funds. The funds were paid through the MIRP amounting to Rs.800,000 from which DCOs had a savings of Rs.60,000.

j. **O&M work**: All the DCOs are doing the O&M work by themselves. The government allocation has come down to about Rs.150 per acre.

The DCOs have also decided recently to pay Rs.30 per farmer representative (FR) attending meetings on their behalf and Rs.35 per person attending meetings of the PMC.

The justification is that on an average, an FR visits the Irrigation Engineer's and/or Project Manager (PM's) office 3 times per week.

In addition to the farmers' organizations, the following organizations/societies also operate in the two divisions:

a. **Thrift and Credit Co-operative Societies (TCCS)**: These are very active in the two areas.

b. **Fisheries societies**: About 300 members have already formed into a fisheries society which is centered on Huruluwewa Reservoir. Fishing gear and loans were provided before the government directive of 'no support' to inland fishery development came about.

c. **Rural Development Societies (RDS)**: There are about 100 RDSs within the two divisions. They undertake contracts for the government agencies.

d. **Dairy producers associations**: The main office of milk collection is located in Kahatagasdigiliya while the Galenbindunuwewa division has 25-30 milk collecting centers. About 4,000 liters of milk are collected monthly.

Some of the organizations are very strong and the PM has decided to withdraw the IO from such organizations. The DCOs have done still better even without the catalytic action of the IO. However, they still require guidance, advice, etc., from the PM.

The strongest DCOs are at Dutuwewa, Track 5, Meegaswewa, Yatalawa, Meegahapattiya and Kokawewa. It is from Meegahapattiya DCO that the IO was withdrawn recently. The President of this particular DCO is the chairman of the district FO in Anuradhapura. While four DCOs are of average strength 3 are still weak.

It should be noted that the above activities are done on a small-scale at present and there is high potential for expansion. The above list indicates that the base to form user groups is already in place which can be strengthened by this Project. Moreover, the strength of organizations which are in operation is an important point in respect of project implementation.

An important activity undertaken by the farmers' organizations which can be supported directly by this Project is to legalize the allotments of the "illegal" water tappers along Kandalama feeder canal and to supply their water needs through constructing a parallel canal to the above canal. Thirteen outlets will be fixed to provide water to these allotments. The LC has agreed to survey the area and allocate the lands.

The villages along Kandalama feeder canal are in the process of expansion resulting in more demand being placed on the already limited supplies which will eventually cut off the entire supply to Huruluwewa. Therefore, action is necessary to focus their attention to

processing and other small industries. These farmers are not served by colonization nor by extension staff. This is an important **rights issue** for further study and action under the SCOR Project.

4. Infrastructure

Huruluwewa watershed is approachable via two main trunk roads namely, Anuradhapura-Trincomalee and Kekirawa-Anuradhapura. The area is fed by a network of roads. The road network within the catchment area is not in very good condition.

The area is supplied with the government services such as irrigation, irrigation management, agriculture, forestry, services providing social welfare, etc. However, these services need much improvement.

According to a recent decision of the government, the Divisional Secretariat is the main focus for all development and other governmental programs in the area. The two DGA's divisions in this watershed are in the process of developing and the Project could help them in this process.

Both offices are being newly established and several important staffs are yet to report for work and/or be appointed. The Galenbindunuwewa office has got some basic supplies with some commodities [1] expected from the SCOR Project. The staff requires some training in environment-related development, planning and community mobilization. The two DGAs of Galenbindunuwewa are trained in computer work but the equipment is not provided for. The registry and the record room have not been established yet. The office has, in the main, the clerical and other supporting staff while the technical staff appointment/selections is not over as yet.

The budgetary allocations for 1992 in this office are as follows:

Salaries and wages Rs.1,480,000; allowances Rs.480,000; travel Rs.125,000; building and repair Rs.20,000; fuel Rs.16,800; office stationery & equipment Rs.35,000; vehicle repair Rs.40,000; utilities Rs.15,000; other Rs.30,000.

The DGA's office of Palugaswewa requires office equipment such as an English typewriter, a photocopying machine, and some basic furniture. They also require training in development-related fields.

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[1] 1 No. English typewriter; 2 Nos. Sinhala typewriters; a set of basic furniture; 1 No. jeep; 1-2 motor bicycles; 1 photostat machine; 1 No. computer.

The following infrastructural facilities which would be of direct relevance to this Project are available in the watershed area:

* A juki machine training center and a carpentry training center
* Government training institute for goat rearing at Seeppukulama
* Three agrarian service centers

The Division does not have an agricultural training center.

5. Present development programmes in operation

There are several development programs in the area which are falling in line with the proposed SCOR Project activities. The design team observed that many of these programs are still at a stage of infancy or are being implemented in a small scale due to several problems. In this respect, the SCOR Project could help solve these problems and speed up implementation, particularly in respect of the Huruluwewa watershed.

A brief description of these programs is given below:

a. **Agro-wells program**: The main agricultural development program which is closely related to the proposed SCOR activities in the area is the agro-wells program. These wells are usually 25' deep with a diameter of 20'. They are sunk in the highland and on the lowland. The program implemented by the ADA concentrates on the highland areas whereas the program of the provincial council is focused on the lowland area. The ADA gives a subsidy of Rs.20,000 per well while the balance is to be spent by the group "owning" the well. A well is constructed for every 5 acres. It costs Rs.60,000 to construct a well including the cost of the water pump. Water pressure in the lowland soil is so high at a depth of 7' that it is not possible to dig the well manually and pump out water using a 4" pump in the dry season. Hence, it is necessary to employ machines to cut the well. It takes about 7 days to construct a well and the digging cost alone is about Rs.20,000. Since 1990, the PC's program has completed 600 wells which are performing very satisfactorily. The average net returns registered for cropped land under this program works out to Rs. 36,963 in the first year while in the second year it has shot up to Rs.49,604 per acre. The crop cultivated was chili during both situations. The PC encourages sinking a large number of wells.

The PC has spent Rs.7.5 million in 1990, Rs.12 million in 1991 and it is planned to spend Rs.13 million in 1992. All these funds (except for 1992) have been fully utilized. There is no need for further budgetary allocation for this activity beyond 1992 since recovery from the user groups owning wells will have begun by the next year. The recoveries could be used as a revolving fund. These wells can utilize even the dead storage of the tank. The legal rights with respect to the land where the well is constructed and of the well itself are with the PC.

It is to be pin-pointed that the agro-well construction program is very actively pursued by agency staff (ADA, PC) as well as farmers. There has not been any study to evaluate the impact of the well-construction program. The AGA Galenbindunuwewa asked the design team whether this Project could help in conducting an evaluation of the program in this area.

The SCOR Project could assist in undertaking an impact assessment of the program and thereafter expanding it.

b. **Tree planting in the catchment and tank beds**: Planting trees in the catchment for economic agroforestry and the utilization of raw materials thus generated for industrial development such as fruit processing and handicrafts are actively supported by the NCP provincial council. This program could be immediately assisted and strengthened under the SCOR Project.

c. **IRDP Anuradhapura**: This came into operation only 2-3 months ago. Among the few items earmarked for execution under the Integrated Rural Development Programme (IRDP) is the rehabilitation of 2 village tanks. The estimates were prepared by the DAS since they were under the center. Later they were taken over by the provincial council which did not accept the estimates prepared by the "center". Fresh estimates are in preparation and it is unlikely that they can be completed before the coming rains. Hence, this item will have to be executed only in the next year. Under the IRDP another component will be the sustainable agricultural development program under which trees will be planted in the catchment and income generating activities will be identified.

d. **DANIDA program**: Under this program there will be tube well construction for drinking water (30 wells are planned), rehabilitation of the water supply to the Galenbindunuwewa town, while 35 houses will be provided with the basic necessities such as well construction, latrines, etc.

e. **Agroswiss**: This program is focused on the monitoring and evaluation (M&E) of farmer's organizations. It will field Govi Mandala Sahayake (GMS).

f. **CARE**: CARE is launching the change agents program aimed at training /mobilizing people for self-employment activities. Already identified activities are rice parboiling, rice milling and provision of loans for various activities.

g. **Sarvodaya**: This is implementing pre-school programs in the two divisions. It also helps in the construction of agro-wells.

h. **SAMADEEPA**: This is centered on the granting of loans for animal husbandry, goat rearing and for other activities for women in particular. The program is in operation in the two AGA divisions.

In Palugaswewa division, there are only a few programs implemented by the NGOs. This division also includes one village (Namalpura) earmarked for development under the provincial council's program of developing remote villages. This particular village falls within the catchment area of Huruluwewa. There is another village where livestock development is being pursued under the Janasaviya programme.

The Project could help in the above programs directly and work in collaboration with them in natural resources management. In addition to above programs, the governmental programs on agriculture, forestry, education, etc. also operate in the two areas. It should be noted that these regular programs are inadequate and do not function properly. For instance, there is a forest reserve called "Huruluwewa forest reserve" in the Palugaswewa area which is not managed well. The Project could assist in the participatory management of reserve areas such as the above through the "production and protection" concepts. The immediate benefits would be better inflow from the catchment area of Huruluwewa.

NILWALA WATERSHED

Physical Features of the Nilwala Watershed

The Nilwala watershed is located in the low country wet-zone agro-ecological region of the Southern Province. It is located in the district of Matara and several AGA divisional areas fall within its command. Some of them which will be included in the initial years of the SCOR Project are Kotapola, Pitabeddara and Akuressa.

The Nilwala River starts from the Panilkanda hills at an elevation of 1,050 meters and reaches the sea at Matara. The area covered by this watershed is 1,000 sq. kilometers while the river itself is 70 kilometers long (see Map 3). The annual rainfall within this watershed ranges from 2,000 milimeters near the coastal area to about 4,000 mm in the hilly areas of Deniyaya, Diyadawa and Panilkanda. The rainfall pattern is of typical wet-zone area.

Watershed Components and Status

This watershed comprises forest reserves of Diyadawa (4,000 ha) and Panilkanda (2,000 ha) from where the river originates, other reservations along the banks of the river and cultivated areas.

The two forest reserves form a part of the wet-zone forest areas where the biodiversity is very high. They also perform the vital function of "catching rains" and of flow regulation. After a recent study, these two reserves were recommended as being of critical hydrological significance and high in biodiversity. Accordingly, it has been recommended that felling operations should not be undertaken in these reserves which should be managed as strict conservation areas. However, illicit felling and clearing of the boundary of these reserves for plantation crops, especially tea, are taking place. It was observed during the field visits that tea

plantations exist even in the middle of these reserves. Improper selection of sites for tea planting combined with improper planting and other agronomic operations have resulted in severe soil erosion and fast degradation of the land areas in the immediate vicinity as well as in adjoining areas of these two vital reserves. Extraction of non-timber products such as rattan, bamboo, and medicinal products, although illegal, is taking place. Kitual palms are abundant in this area but people cannot make use of them as income-generating activities due to "prohibited" nature of kitul tapping. However, if the users are organized and the extraction of sap is undertaken as a group combined with planting operations, the authorities are willing to relax the present ban on tapping Kitul. This resource will provide a rich source of income for the people. Apart from some occasional policing, no effective protection takes place in these reserves, at present.

The reservations along the banks of the river have already been encroached by the people living by its course. Poor agronomic operations and tenure problems have resulted in a high degree of soil erosion. Both illicit and legitimate gemming take place along the river thus accelerating bed scour and river bank erosion. These have resulted in faster flow of the river and drying up of the adjacent areas. People living by the river particulalrly in the downstream areas of Kadawedduma and Thihagoda, near Matara complain of water problems not only for cultivation but even for drinking. This process of drying up the land is common in the lower reach of the river where the Nilwala flood protection program is in operation. The main objecives of this scheme are to protect about 9,000 hectares of rice fields and the property of people against annual floods. The program involves the operation of flood protection dikes and the pumping of flood water from the land area into the river which is ultimately discharges into the sea. Because of the intense pumping operations, the fresh water is taken out of the land which results in faster drying up of the land area.

The main part of this watershed is under various forms of cultivation and human settlement. The main types of cultivation are rice (18,000 ha), tea in the upper areas, and coconut and rubber in the lower reachers.

The disappearance of forests either by illicit felling or due to chena farming is the main problem in this watershed. This has resulted in a very high level of soil erosion which is accelerated by the high slope and rainfall of the area. The destruction of forests is causing a chain of problems of which flood, irregular flow regime and degradation of cultivable land are most important in this watershed. It is in this area that the SCOR Project could have some immediate impact.

The land use characteristics of the watershed are shown in Map 4.

Human Resources and Organizations

Being a wet-zone area, this watershed area has a high population density. A majority are small farmers. The main occupation of the people is agriculture which takes a variety of forms such as the cultivation of plantation crops (tea, rubber, coconut), cultivation of minor export crops

(cinnamon, lemon grass), rice, forest products (medicinal plants, rattan, bamboos, illicit kitul-tapping), and annual crops cultivation including the chenas.

A large number of organizations are found such as farmers' organizations established under the Agrarian Services Act, such as tea, rubber and coconut growers' associations or co-operatives, Rural Development Societies (RDS), youth clubs, environmental groups, dairy producers' associations, Thrift and Credit Cooperative Societies (TCCS), etc. These organizations perform various production and welfare-related programs. In some areas, the associations have formulated various development programs which are in the process of negotiating assistance from various development agencies. Still a large number is awaiting such assistance. A contrast is seen between the organizations in the wet zone and those in irrigation schemes in the dry zone established through the use of IOs. The latter ones are methodical and have initiated several projects. Most of them have reserve funds and are engaged in economic activities.

In the above matters, the SCOR Project could help to strengthen these organizations' especially learning from the successes of farmers' organizations in irrigation schemes.

Infrastructure

The watershed is easily approachable via-two main trunk roads of Rakwana-Deniyaya and Galle-Deniyaya. There is a good road network within the watershed. The two AGA offices are in the process of moving into new buildings and the staff appointments are taking place. The offices of Kotapola and Pitabeddara require equipment such as typewriters, computers, photocopy machines, etc., modes of transport and training for the staff.

Development Programs

The tea, coconut and rubber agencies are performing active development progarms particulalrly in the upper watershed areas. Several environmental development and awareness programs are in operation funded by NGOs and internal agencies such as NORAD and IUCN. The following discussion provides a brief account of the nature of development programs needed in this watershed:

a. Land use planning: A necessity to identify the capability of various land types and selecting the suitable cropping patterns and crops are observed. For instance, tea is grown on improper soils and steep land terrain in Kotapola AGA division; a large area has come under tea where it is not suited. A suitable crop for stage 1 of Nilwala Scheme is yet to be identified. People come to know about the unsuitability of new land for tea cultivation only after opening of such land.

b. Forestry, protection and development: Forest areas are being increasingly intruded throughout the watershed. This includes even the strict reserves (Sinharaja and Diyadawa), catchment areas of reservoirs and mangroves. Forest destruction is rapid and

the reforestation programs appear to be grossly inadequate. Tea is reported to have been planted inside the Sinharaja and Diyadawa forest reserves. Forests near human settlements in Deniyaya area have almost completely vanished. Several groups have voluntarily come up to protect the forests. People are interested in protecting forest areas and have assisted law-enforcing authorities. However, the political willingness and support for the efforts are not yet forthcoming. Formation of forest user groups should also be supported.

People who operate irrigation fields below do not have a knowledge of the status of watersheds. Most of them have never seen it. During field discussions, an idea was expressed by users to form users' organizations surrounding the watershed and to link them with user groups below.

The design team came to know one instance where watershed protection was linked with income generating activity. Around Kamburupitiya people near a forest plantation have been depending on an industry centered on "bata" (member of bamboo family) plants. This is almost extinct. The Forest Officer has formed a group and has issued the members a licence to cut "bata" on condition that 100 plants are established for each plant cut. The organization has accepted the responsibility for ensuring this.

c. Mining: Two main types of mining take place in the Nilwala Basin. One is gem mining mainly around the Deniyaya area. This has resulted in a series of environmental problems such as deepening the river bed leading to greater bed scouring, collapse of banks and irrigation structures. Although adequate penalties exist they are not adhered to by the law enforcing authorities. Gem mining has also led to damage of structures such as river bridges. Deepening the river bed has made the river flow faster thus depleting the water table of the land. This has affected the vegetation in the area. There are signs of domestic wells running dry since the water table in the soil has gone down as a result of the deepened river bed.

Second, in downstream of Nilwala River, sand mining is a serious problem. Some effects of sand mining are deepened river bed and lowered water table in the adjoining land.

d. Opportunities for non-agricultural activities: This watershed offers several opportunities for the development of industries. Among them are the kitul industry, fruit processing, livestock/dairy [2] industries in the Deniyaya area and, fruit, rice, dairy,

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[2] In Deniyaya area, the dairy industry was in a well-developed status several years ago. A chilling plant was installed and the daily collection by the Milk Board went up to 500 liters. This dropped to a point where it is not profitable to continue the diary industry any more. People in Kirala kele Project wanted to develop the buffalo industry and had written to several authorities. They want quality animals, pasture/fodder varieties and their requests are unlikely to be met.

banana fiber, gem cutting industries in Matara and Galle areas. Kitual industry has a considerable potential for expansion.[3] A survey done by youth in Deniyaya (Lankagama [4]) indicated that vinegar purchased in the market which is subsequently used in households is artificial when the area itself is rich in kitul trees the sap of which could yield natural vinegar. It is not practiced any more due to administrative (Exercise Department), technological (new techniques such as methods of tapping, processing, tree climbing, tree propagation) and institutional (no permits) factors. Tapping is a specific art which everyone cannot perform. This knowledge must be transferred from the skilled people to others. Several vegetable production projects started but all collapsed since people do not want to move away from the tea "mentality." The extent and status of kitul plantation are unknown.

e. Environmental protection: Protection of the environment against the more recent developments [5] is receiving the attention of youth groups and organizations. Among the projects they have started are the industries dealing with bamboo, kitul, agroforestry, and the gem industry. Project proposals have been prepared by these groups and forwarded to relevant authorities and any follow-up by the agencies has not been observed up to now.

f. Rice: This industry is predominantly traditional. Both rain-fed and irrigated rice is cultivated but the production is far below the requirement. Problems are water deficit, [6] soil problem, [7] high risk, low-level fertilizer use, institutional including the absence of a proper research focus. Along Galle-Deniyaya road, the design team observed that more than 60 percent of the rice lands have not been cultivated during the 1991/92 season. Lack of water, building-up of acidity, tenurial problems and nonavailability of unhusked seed are the important reasons. An extent of about 5,000 acres of lowland land in stage 1 of Nilwala cannot be cultivated due to the build-up of salinity and iron toxicity.

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[3] Some of the industries which can be developed are toddy, trickle, jaggery and vinegar making, use of kitul seeds for various products, kitul flour and fiber.

[4] This is a village which was famous for jaggery and trickle in the past. The industry is disappearing now.

[5] Three more recent developments are expanded tea cultivation and the Nilwala Flood Protection Scheme.

[6] About 10 years ago, there was no shortage of water for rice. Now, due to deepening of Nilwala River, dilapidated status of irrigation schemes due to poor O&M, construction of flood protection scheme, etc., the water shortage has become very acute.

[7] The main soil problem is associated with iron toxicity.

The system of supplementary irrigation utilizing shallow groundwater has not been undertaken even on pilot basis. There is a vast potential to improve agriculture through this source of water and thereby increase income in this region since it is only 2-3 irrigations that are required in addition to the rains in order to produce a crop in the dry season.

g. Marketing: Marketing of vegetables and agricultural products other than rice and tea is a serious problem in the area. In some cases producers cannot sell low-country vegetables such as gourds, long beans, cucumber, etc. They have no knowledge about the prices in Colombo and do not have the bargaining power.

h. Land tenure: Several land-tenure problems are observed: A backlog of encroachments pending regularization. It goes under the regular government progams which require speeding up. In Nilwala Scheme, land ownership of Kiralakele is in dispute. Of the lands taken over by the government for the scheme, only some lands were alienated to the people and this too was not done under the regular permit system. Tenure of 750 the acres is in conflict. Tenure rights of river reservations will have to be studied and appropriate modifications need to be worked out.

i. Irrigation: Five main irrigation-related problems were observed. First, the existing irrigation infrastructure does not operate satisfactorily. In Deniyaya, out of about 108 ha under irrigation, 75 percent of the extent requires infrastructural repairs. Poor O&M and deepening of the river due to gem mining are other problems affecting irrigation in the area. Out of the 1,043 ha of rainfed lands, 30-35 percent can be converted into irrigable land by new construction.

Second, water resources in the wet zone, especially groundwater, have not been utilized for dry-season supplementary irrigation. A large area can be brought under intensive cultivation by this practice.

Third, a large number of small tanks which have been in existence from the ancient past have been completely neglected. These include minor tanks in Maramba, Paraduwa, Imaduwa, etc. along the Nilwala River Basin.

Fourth, the Nilwala project has been designed only for flood protection without providing for dry-season irrigation utilizing river flow. In dry spells, land dries up quickly.

Finally, improving water management has a large scope in irrigation projects around the Nilwala Basin. The participation of farmers in water management through formation of farmers' organizations, and securing their effective participation in systems management must be worked out.

Conclusions

On the basis of the above description, a summary of activities where the SCOR Project could directly help is provided in this section. It, therefore, indicates in summary form the potential available for developing the natural resources base through the principle of shared control of resources.

Huruluwewa Watershed

a. Huruluwewa watershed represents an area where water and land rights issues are in force. This needs to be further studied and assisted by SCOR since both these issues fall in line with this Project.

b. Status of the catchment of Huruluwewa is very poor particularly in respect of conservation. The present trend is toward further destruction caused by chena lands. This trend must be reversed and both protection and production must be pursued. There is a potential for reforestation with economic and high-value forest trees which would not only provide benefits to the people there but will also increase inflow into the tank.

c. Huruluwewa is a reservoir where water productivity is relatively high. However, the system does not get adequate supply even though the Mahaweli diversion is expected to augment the reservoir. The SCOR Project could directly assist strengthen the organizations in the upstream area and develop a cooperative program involving both the upstream and downstream users. Introduction of water-saving measures by the upstream users and concentrating on less water use activities such as agro-processing for these users are some positive cases which could be assisted by SCOR.

d. There is a great opportunity to enhance the capacity of farmers' organizations working in the area and thereby reducing government expenditure which otherwise will have to be spent on the management of natural resources. The users' organizations have proved their capability to take over management responsibility which could be directly supported by SCOR. As discussed above, the strengthening of farmers' organizations has already cut down government expenditure while effectively managing the natural resources.

e. The basic steps required in evolving a production and protection strategy have already been taken place and what is important is to build on this base. At present, the impact is low because only a few activities are taken up and the scale is also low. The SCOR Project could assist here.

Nilwala Watershed

a. The desirability of experimenting with the production company concept.

b. The need for consolidating land holdings presently underutilized for organized production and area specialization.

c. The need for greater focus of future research in the wet-zone area and the use of groundwater for supplementary irrigation.

d. Using catalysts to initiate, promote and strengthen users' organizations. It is to be noted that farmers' organizations in the wet zone are weak and need to be strengthened.

e. The scope for linking forestry protection with economic activity through the involvement of users' organizations needs to be explored and strengthenend. There is already some experiences and the Project may utilize such experiences as the basic learning ground.

g. Land tenure problems and streamlining the permit-issue process. In this connection, it may be necessary to privatize survey functions in order to expedite issuing of land titles.