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**Mid-Term  
Evaluation of the  
Shared Control  
of Natural  
Resources  
Sub-Project,  
Sri Lanka**

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## EXECUTIVE SUMMARY

The Shared Control of Natural Resources (SCOR) Sub-project of the Natural Resources and Environmental Policy Project (NAREPP) is an innovative approach to improving productivity in rural Sri Lanka by linking conservation to new tenure rights on agricultural and forest lands.

SCOR's goal is to increase the sustainable productivity of the natural resource base in Sri Lanka in ways that will improve people's livelihoods now and in the future, with due regard for the environment. SCOR's purpose is to increase shared control of land and water resources in watersheds through state-user partnerships that contribute to intensified and sustainable agricultural production while conserving the physical, biological, and soil environments.

The SCOR Mid-term Evaluation was conducted between January 28 and February 25, 1995. The Evaluation Team conducted interviews in Colombo, Anuradhapura, and Galle with principals from the government and the U.S. Agency for International Development in Sri Lanka, with representatives of the Cooperative Agreement recipient (the International Irrigation Management Institute or IIMI), with members of IIMI's project implementation team for Phase I of SCOR, and with members of the NAREPP technical assistance team based in Colombo.

In the two pilot watershed areas, the Evaluation Team met with farmers and user group representatives, providing its own translation services when needed and often meeting with project beneficiaries without members of the SCOR-IIMI implementation team. Meetings were held with the Huruluwewa Watershed Resources Management Team in Palugaswewa, the Provincial Steering Committee in Anuradhapura, and the North Central Province Chief Secretary. Meetings were also held with the Chief Secretary for Southern Province and with the Provincial Steering Committee in Galle.

## FINDINGS

The SCOR project starts with the local natural resource managers — the farmers and local government agencies — and helps them form new organizations for land use planning. The project then gives these new groups technical and financial assistance to implement improved farming, agro-forestry, and water management activities. Villagers plan their future land use at a micro-watershed level. They then work with SCOR staff to gain access to new leases of government land for farming or agro-forestry; to inputs like improved crop seed or multiple-use tree seedlings; and to technical assistance on conservation and production from extension agencies, nongovernmental organizations (NGOs), and SCOR itself.

The Sri Lanka Field Office of IIMI has fielded an excellent, highly motivated staff to implement SCOR. SCOR's planning and implementation process is facilitated by a remarkable set of project-generated teams and steering committees, made up of representatives from the key Sri Lankan government agencies. These teams and committees address policy questions and guide local government contributions to the project's goals. Rapid field implementation has been facilitated by the participatory design process used to design SCOR. During project implementation, village and local government involvement in site selection and choice of new conservation technologies, followed by farmer participation in creation of village land use plans, has created considerable enthusiasm in the Sri Lanka

government for SCOR's approach, and directed attention to the dynamic connection between local organizations, tenure rights, and natural resources protection and conservation.

Early results of SCOR's efforts in the two pilot watersheds of Huruluwewa and Nilwala are impressive: in the 15 months the SCOR field teams have been operative, project accomplishments meet or exceed the targets set by USAID and IIMI for Phase I of SCOR in the original Cooperative Agreement. SCOR has helped form 165 resource user groups made up of 2,600 farmers. They are undertaking 33 different types of conservation-related production activities, such as conservation farming, timber and multi-use tree planting on leased government lands, improved homestead gardens, and improved management of steep tealands.

Watershed Resource Management Teams, made up of local government and farmer group representatives, meet regularly to plan improved use of irrigation water and upland land resources on a watershed level. Provincial and National Steering Committees are adopting SCOR resource use planning concepts and have already implemented policy changes such as increasing farmers' land tenure rights, including lengthening land lease periods; regularizing encroachment land with user permits; and creating "tree-tenure" contracts for rights to tree products from forestry buffer zones.

## CONCLUSIONS

- The SCOR-IIMI implementation team has made a remarkable beginning in both watersheds in organizing resource user groups and establishing excellent examples of appropriate, simple conservation practices on farms and forest land.
- The SCOR project has demonstrated its ability to have significant impact on natural resource conservation practice and policy, rural income generation, and the democratization of resource use planning in Sri Lanka.
- SCOR's work is rapidly gaining recognition as an effective approach to problems of natural resource degradation and declining agricultural productivity on government-controlled lands. The Asian Development Bank among others, is already analyzing SCOR's work.
- Although the project has been remarkably effective in spreading its ideas in the field, the Evaluation Team believes that SCOR's policy contribution in Phase II can be strengthened:
  - A tendency to assess SCOR's worth by the number of hectares covered, although understandable, may distract attention from SCOR's tasks as an action research and policy reform project. To expand its geographic coverage with local government resources, SCOR must produce high-quality action research, replicable models, and acceptance of creative approaches to increasing security of land tenure.
  - Controversy surrounding alienation of public lands in Sri Lanka may unduly slow SCOR's otherwise considerable progress in finding creative ways to increase farmers' land tenure rights. Planning a National Workshop on Conservation, Productivity, and Land Tenure Reform sponsored by SCOR later in the project would help heighten attention to the interdependence of these objectives throughout the remainder of the project.

## **RECOMMENDATIONS**

Many resource management ideas being implemented by SCOR are truly innovative in the Sri Lankan context. The project is designed as action research, in which field implementation generates new models, government agencies develop new planning and policy tools, and SCOR teams document the process of change. The Evaluation Team believes that SCOR's Phase II should reemphasize the action research mandate, and focus on developing and validating a model of land and water resource management that includes appropriate conservation technology, village organization, and government policy at a cost that is realistic and replicable in Sri Lanka.

- The SCOR sub-project should be extended for a four-year Phase II, as planned, through a renewal of the Cooperative Agreement with IIMI.
- SCOR-IIMI should fill key staff vacancies to maintain the team at full strength for at least two more years and should continue to access specialized assistance on tenure and conservation.
- SCOR's early successes in two pilot watersheds need to be consolidated; conservation and productivity enhancement techniques, income generation, planning models, and policy reform innovations must be carefully documented.
- Conservation technologies introduced by the project should be subjected to rigorous benefit-cost analysis.
- SCOR and USAID should seek ways for SCOR resource user groups to benefit from USAID-funded projects in agricultural marketing and business development such as the Sri Lanka Enterprise Project or the Mahaweli Enterprise Development Project.
- SCOR research should focus on documenting the new resource management models and the relationships between land tenure, adoption of conservation practices, and productivity.
- SCOR should increase its emphasis on training for District and Provincial government officers to ensure that SCOR planning methods and conservation technology are transferred to the local population.
- SCOR should sponsor a National Workshop on Conservation, Productivity, and Land Tenure Reform.
- Late in Phase II, SCOR should assist local government agencies and NGOs to replicate a minimum-cost package of land use planning, conservation practices, and land tenure.

**GLOSSARY**

|               |   |
|---------------|---|
| <b>ADB</b>    | <b>Asian Development Bank</b>                             |
| <b>AI</b>     | <b>Agriculture Instructor</b>                             |
| <b>CA</b>     | <b>Cooperative Agreement</b>                              |
| <b>DCO</b>    | <b>Distribution Canal Organization</b>                    |
| <b>FAO</b>    | <b>Food and Agriculture Organization</b>                  |
| <b>IIMI</b>   | <b>International Irrigation Management Institute</b>      |
| <b>IMD</b>    | <b>Irrigation Management Division</b>                     |
| <b>IMPSA</b>  | <b>Irrigation Management Policy Support Activity</b>      |
| <b>GSL</b>    | <b>Government of Sri Lanka</b>                            |
| <b>GTZ</b>    | <b>Gesellschaft für Technische Zusammenarbeit</b>         |
| <b>LOP</b>    | <b>Life of Project</b>                                    |
| <b>LUPPD</b>  | <b>Land Use Policy Planning Division</b>                  |
| <b>MADR</b>   | <b>Ministry of Agricultural Development and Research</b>  |
| <b>NAREPP</b> | <b>Natural Resources and Environmental Policy Project</b> |
| <b>NCP</b>    | <b>North Central Province</b>                             |
| <b>NGO</b>    | <b>Nongovernmental Organization</b>                       |
| <b>NSC</b>    | <b>National Steering Committee</b>                        |
| <b>ODA</b>    | <b>Overseas Development Authority</b>                     |
| <b>PACD</b>   | <b>Project Assistance Completion Date</b>                 |
| <b>PSC</b>    | <b>Provincial Steering Committee</b>                      |
| <b>SALT</b>   | <b>Sloping Agricultural Land Technology</b>               |
| <b>SCOR</b>   | <b>Shared Control of Natural Resources Sub-project</b>    |
| <b>SHTA</b>   | <b>Small Holder Tea Authority</b>                         |
| <b>SP</b>     | <b>Southern Province</b>                                  |
| <b>USAID</b>  | <b>United States Agency for International Development</b> |
| <b>WRMT</b>   | <b>Watershed Resource Management Team</b>                 |

## **CHAPTER ONE**

### **INTRODUCTION**

This Mid-term Evaluation of the Shared Control of Natural Resources (SCOR) Sub-project of the Natural Resources and Environmental Policy Project (NAREPP) was performed in accord with the Terms of Reference of the U.S. Agency for International Development contained in Appendix A. The SCOR sub-project was planned to be implemented in two phases, with the first Phase to last two years. A second phase of four years was planned to follow and to take guidance from a scheduled midterm review to occur in the second year of implementation. Accordingly, this evaluation has the explicit intent of assisting managers and participants in SCOR to analyze their experience in Phase I and to identify more clearly SCOR's directions for Phase II.

The specific objectives of this evaluation include:

- Assess the performance of the SCOR activities or interventions implemented in the Huruluwewa and Nilwala watersheds;
- Determine to what extent project interventions are sustainable, appropriate, and potentially effective in meeting the objectives of the project and of USAID/Sri Lanka's strategic objectives;
  - Assess the capacity of the International Irrigation Management Institute (IIMI) and the SCOR-IIMI team in implementing SCOR to achieve full benefits, expected end-of-project outputs and impacts, and spread the impact of the project;
  - Recommend action by the Government of Sri Lanka (GSL) and USAID/Sri Lanka relevant to extending the SCOR into Phase II; and
  - Recommend any possible improvements to help assure SCOR goals and targets are met, if SCOR is extended.

In all field work and meetings the Evaluation Team has given special attention to the physical, economic, and institutional sustainability of SCOR activities and policy initiatives. The team's judgements on these matters are based as much on previous experience with projects such as SCOR in other contexts as they are on concrete progress by SCOR to date. Nevertheless, after only a little more than one year and one full rainy season (*Maha*), impressive results and opportunities for increased impact are already apparent in the SCOR approach.

The SCOR Mid-term Evaluation was conducted between January 28 and February 25, 1995 by a team composed of two American and two Sri Lankan professionals, whose experience spans watershed management, sloping land conservation farming systems, rural sociology, agricultural economics, and Sri Lankan water and watershed management experience and institutions. The team conducted interviews in Colombo, Anuradhapura, and Galle with principals from GSL and USAID/Sri Lanka, representatives of the Cooperative Agreement Recipients (IIMI), members of their project implementation team for Phase I of SCOR, and members of the NAREPP technical assistance team based in Colombo. Field visits were made to each watershed during which most project locations were visited. The team met with farmers and user group representatives, providing its own translation services where needed and often meeting with project beneficiaries without members of the SCOR-IIMI implementation team. Meetings were held

with the Huruluwewa Watershed Resources Management Team in Palugaswewa, the Provincial Steering Committee in Anuradhapura, and the North Central Province Chief Secretary. Meetings were also held with the Chief Secretary for Southern Province and with the Provincial Steering Committee in Galle.

This report follows a logical progression beginning with a review of the SCOR goal, purpose, and objectives. This review is followed by consideration of progress made to date in SCOR implementation. Special attention has been given to user group formation; to the appropriateness, effectiveness, and sustainability of SCOR interventions; to progress in increasing farmers' tenure rights; and to the role of action research in the project. The review ends with a summary of findings, conclusions, and recommendations regarding extension of SCOR into Phase II, and recommendations for increasing SCOR's effectiveness and sustainability in the event that Phase II is approved.

It is early in the life of the project, but already SCOR is coming under intense scrutiny by GSL agencies and international donor organizations interested in SCOR's approach. This report is intended to help those involved in SCOR learn from its first year of experience, consolidate its successes, and refine and refocus its interventions and approach.

## **CHAPTER TWO**

### **REVIEW OF SCOR GOAL, PURPOSE, AND OBJECTIVES**

#### **NAREPP GOAL AND PURPOSE**

SCOR is a sub-project of the Natural Resources and Environmental Policy Project, created by Project Amendment Number One approved January 28, 1993, extending the NAREPP by 15 months and adding \$7,000,000 for the support of SCOR. SCOR was planned to take approximately six years and be made up of two Phases, working initially in two pilot watershed areas — Huruluwewa watershed in North Central Province and Nilwala upper watershed in Southern Province — and possibly expanding to a total of four watersheds by the end of Phase II. Phase I was to be for two years with an interim evaluation scheduled to be completed before June 1995. Phase II was planned for a period of approximately 4 years with a Project Assistance Completion Date (PACD) of September 30, 1998. Technical Assistance was to be provided to SCOR by the International Irrigation Management Institute under a Cooperative Agreement with USAID.

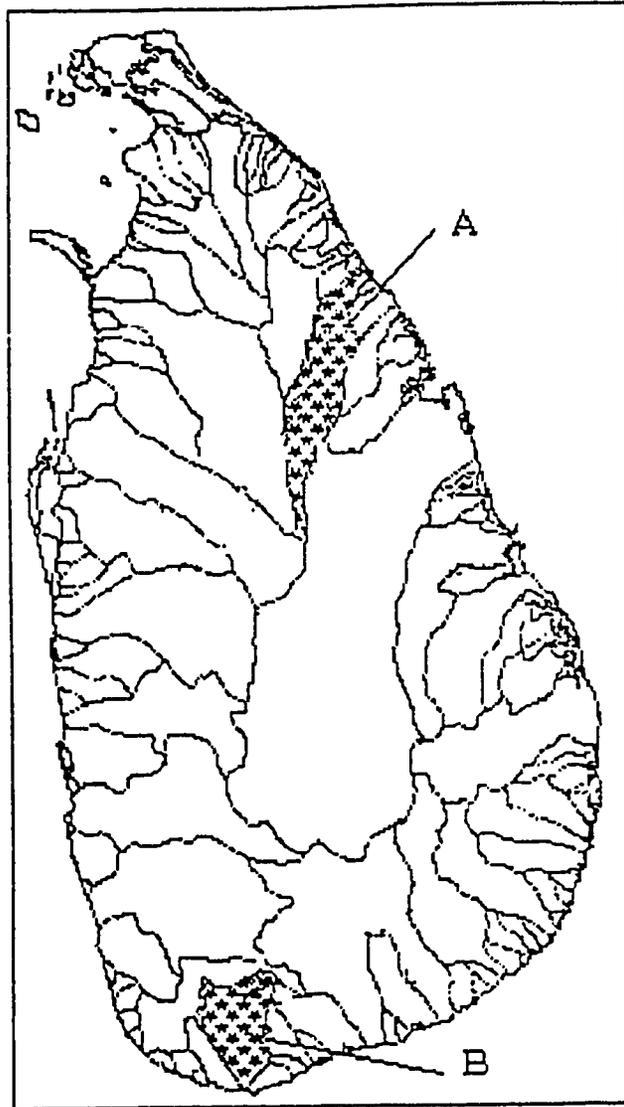
NAREPP's goal is to "sustain economic growth in Sri Lanka by efficient management of the island's forest, wildlife, soils, and other coastal and inland natural resources" (Babb, p. 3). Its purpose is to "improve public and private institutional performance in formulating and implementing effective environmental policies and developing sustainable and environmentally sound development programs" (Babb, p. 3 and USAID, 1993a, p. 4). NAREPP's goal and purpose are consistent with USAID's strategic commitment to preserving the global environment, especially as this relates to management of natural resources for sustainable economic growth. The Project Paper Supplement defining SCOR describes NAREPP as having evolved a programmatic approach to critical institutional and policy changes to:

- Develop protected areas which preserve Sri Lanka's biodiversity;
- Introduce regulations and technologies for the control of industrial pollution;
- Promote public awareness and participation in resource planning and management; and
- Factor environmental considerations into planning and investment decisions (USAID, 1993a, p. 4).

SCOR supports and extends the latter two of these critical components by emphasizing "agriculture and its consumption of and its impacts on land and water resources. In particular, it addresses environmental degradation within watersheds, upon which a major portion of Sri Lanka's economy and population depend" (USAID, 1993a, p. 5).

# MAP 1

## SHARED CONTROL OF NATURAL RESOURCES (SCOR) WATERSHEDS



Pilot watersheds -

A - Huruluwewa Watershed

B - Nilwala Watershed



River Basins

## SCOR SUB-PROJECT LOCATIONS

SCOR was designed to try out and to demonstrate its participatory approach to land use planning in two characteristic but distinctly different areas of Sri Lanka, Huruluwewa in the Dry Zone in north central Sri Lanka and Nilwala in the Wet Zone in the south.

### Huruluwewa Pilot Area

The project area comprises 420 square kilometers in the Huruluwewa watershed and adjacent feeder canal area of North Central Province. The total population is approximately 39,000 persons, or a population density of 93 persons per square kilometer (Widanapathirana, p. 37). Huruluwewa has a typical dry zone climate with about 1200 mm. of annual rainfall, most of it concentrated in the *maha* wet season from September to January. The Huruluwewa Irrigation Reservoir and more than 200 minor tanks provide seasonal irrigation to paddy in the lowland soils. The uplands are gently sloping shallow soils covered in scrub jungle and used for shifting cultivation, or *chena*.

Government-sponsored settlement schemes below dry zone irrigation reservoirs have been used to redistribute land to Sri Lanka's poor and landless for at least 50 years. Although the first settlements were organized in the main irrigation command areas, the settlers' descendants as well as migrants from the densely populated wet zone have "encroached" (squatted) in the watershed above the tanks and along the feeder canal of the Huruluwewa Irrigation Reservoir from which they illegally irrigate government land. These farmers practice *chena* cultivation in the rainfed uplands, irrigation of paddy from minor tanks where possible, and substantial off-farm work.

### Nilwala Pilot Area

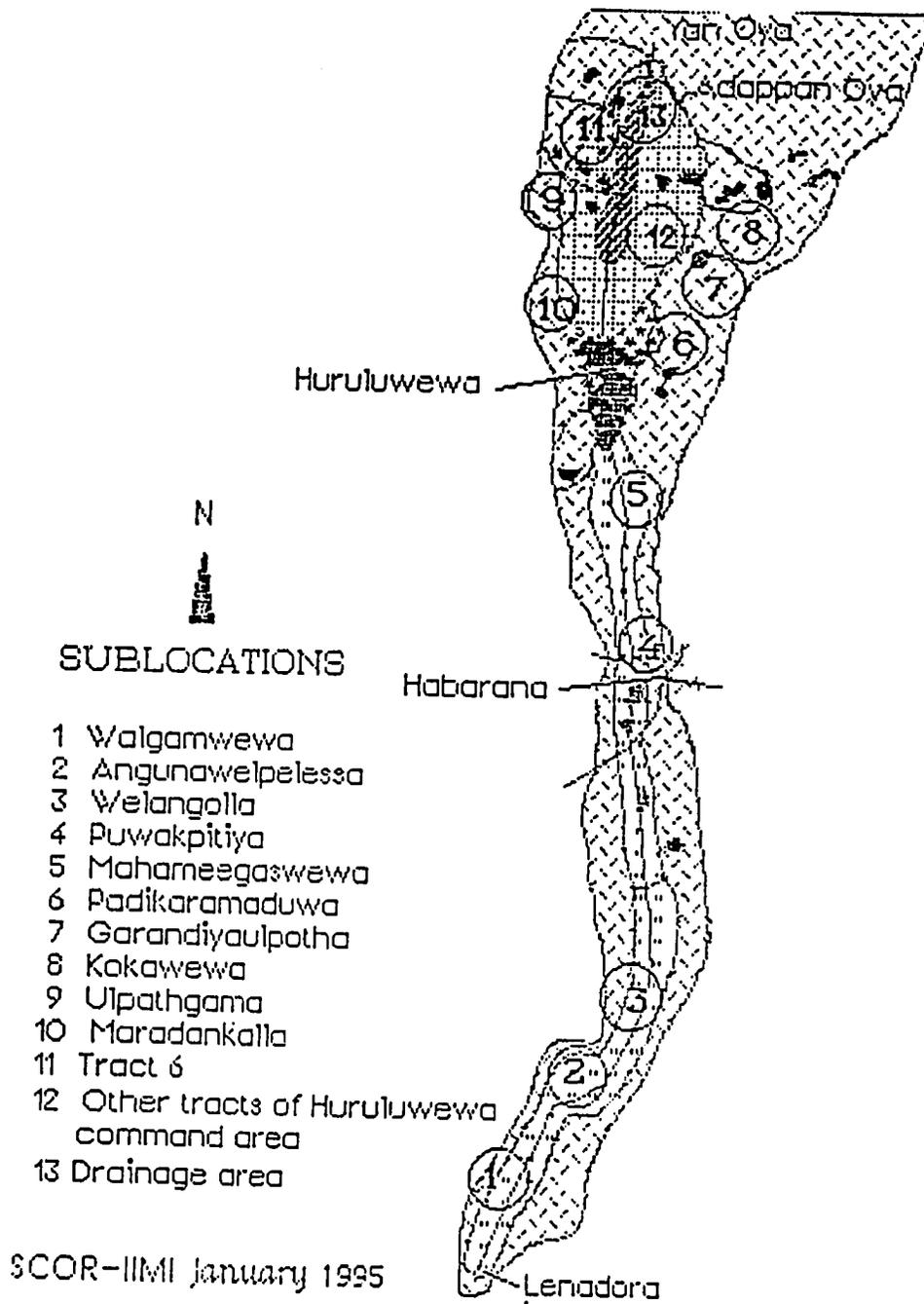
The Nilwala Watershed covers 1,462 square kilometers in the Southern Province. The population density in the 52 square kilometer upper watershed pilot area where SCOR is working is approximately 450 persons per square kilometer, approximately five times that in Huruluwewa. Nilwala has a typical wet zone climate, with an annual rainfall of 2,000-3,000 mm, and no extended dry season, although February and August experience significant reductions in typical rainfall. The upper watershed, from 300 to 1,000 feet above sea level elevation, is steeply sloping terrain and intensively cultivated, mostly in tea.

Large state-owned tea plantations cover substantial portions of the best soils, while smallholders cultivate tea and home gardens, often on marginal sites. Land shortage among smallholders is acute. About 30 percent of the project area is in steeply sloping scrub or forest, mostly state-controlled, but encroachments by smallholders eager to expand their tea are rapidly depleting the remaining forest cover.

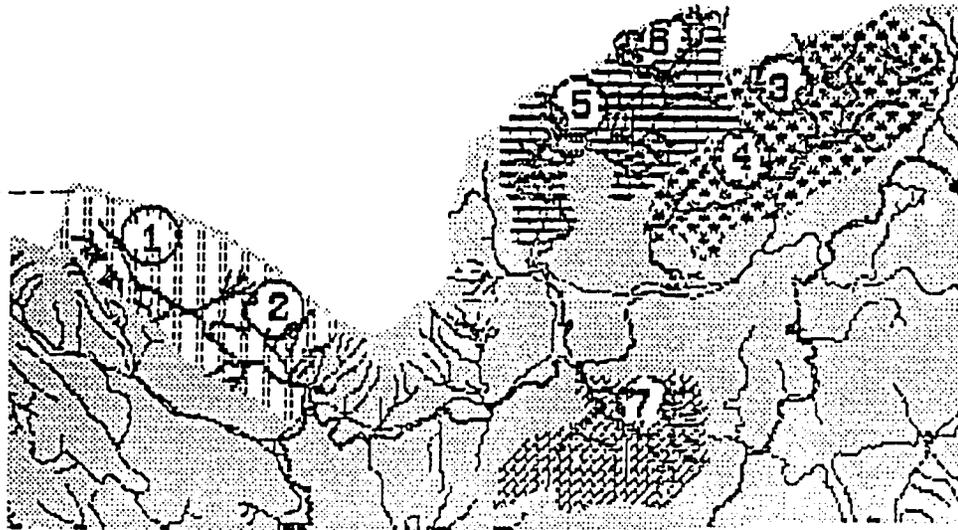
## WATERSHED MANAGEMENT IN SRI LANKA

The threat to Sri Lanka's natural resource base posed by progressive land degradation in the country's watersheds has been repeatedly recognized by both the government and development assistance agencies. Soil erosion, deforestation and other forms of watershed degradation endanger not only the

## MAP 2 HURULUWEWA WATERSHED



## MAP 3 UPPER NILWALA WATERSHED



Grid  North

feet  
  
 5.61172

### SUB WATERSHEDS



Millawa



Aninkanda



Diyadawa  
Thenipita



Horagala

1. Upper Millawa
2. Millawa
3. Aninkanda Dathalugala
4. Aninkanda
5. Diyadawa Thenipita
6. Thenipita
7. Horagala

future productivity of the agricultural uplands, but also the sustainability of Sri Lanka's huge recent investments in hydropower, irrigation, and agricultural resettlement programs.

Since the 1980s Sri Lanka's response to this threat has included projects in land use policy planning (with the Food and Agriculture Organization or FAO), forest land use mapping (with the Overseas Development Authority or ODA), reforestation and watershed management in the Mahaweli (with USAID and the German aid agency or GTZ), and participatory forestry (with the Asian Development Bank or ADB), among others. Nonetheless, a 1991 study quoted by Fleming remarks, "Nowhere are the problems of overlapping and uncoordinated environmental action by government more evident than in watershed management. . . . little has been accomplished in managing watersheds . . ." (Fleming, p. 11).

In 1991, the Irrigation Management Policy Support Activity (IMPSA) Project of USAID elaborated a series of recommendations for effective watershed management programs in Sri Lanka, based on successful experience in other Asian countries. Many of these recommendations have been effectively incorporated into the SCOR project design — for example, appropriate land use planning, local involvement in project design, attention to land tenure issues, linking productivity and profit to conservation, establishing demonstrations in villages, and attending to proper monitoring and evaluation.

### **SOIL CONSERVATION IN SRI LANKA**

Sri Lankan Government action to conserve productive agricultural soils began in 1950 with the establishment of the Soil Conservation Division in the Ministry of Agricultural Development and Research (MADR), and the passage of the Soil Conservation Act No. 25 in 1951. The law stipulated that MADR could make regulations for soil conservation (for example, fix penalties for contraventions). Regulations for control of erosion on tea land were enacted in 1953, and subsequently "used to reasonable effect" but "no single prosecution under the Act is known" (Stocking, p. 27). Although some line agency extension agents continued to receive training in "mechanical conservation methods," the Soil Conservation Division has declined in importance, and no other major government programs in agricultural soil conservation have been launched since that time.

### **SCOR SUB-PROJECT GOAL AND PURPOSE**

As embodied in the Cooperative Agreement, SCOR's goal is "to increase the sustainable productivity of the natural resource 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" (USAID, 1993b, p. 1). SCOR's purpose is "to increase shared control of land and water resources in water sheds (sic) through state-user partnerships that contribute to intensified and sustainable agricultural production while conserving the physical, biological and soil environments" (USAID, 1993b, p. 1).

The Cooperative Agreement identifies four specific objectives for SCOR:

- To improve the incentive and institutional context in which agricultural and other commercial activities are undertaken in pilot watersheds (Huruluwewa and Nilwala) so as to insure both productivity and sustainability of land and water use;

- 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 (land and water) 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 "project" mode to a "program mode" (USAID, 1993b, pp. 1-2).

SCOR is viewed as a holistic project that uses a participatory approach to involve both local populations and government officials from the planning stage through implementation and assessment of project results. It focuses the considerable research capability of the SCOR-IIMI team on the important policy agenda of identifying and testing models of more sustainable productive use of natural resources in upland areas of the North Central Province (NCP) and the Southern Province (SP). Key elements of the SCOR strategy focus on stabilizing upland farming by transferring increased tenurial control of resources (especially land) to upland farmers, introducing watershed-based land use planning with resource user groups and local government authorities and line agencies, and introducing and validating appropriate conservation farming practices in the Huruluwewa and Nilwala pilot areas.

SCOR is concerned with management of forest and grasslands, improved uses of land, soil conservation, and water management — both on-site to reduce soil loss and increase production and in relation to other competing off-site water users' needs (USAID, 1993a, p. 6). SCOR combines attention to protection of the natural resources base with increasing sustainable agricultural production. SCOR supports the USAID Strategic Framework in Sri Lanka not only in management and protection of the natural resource base but also by increasing participation in democratic systems through the formation of resource users groups and the registration of user organizations. These groups facilitate tenurial arrangements with government agencies, increasing the lengths of user rights agreements and establishing ownership rights to sources of income such as involving people in planting and tending timber trees on forestry reservations.

By taking sub-watershed (minor catchment) areas as targets SCOR hopes to be able to demonstrate to farmers and officials alike the benefits of land use mapping, land use planning, and conservation interventions to reduce land and water resource degradation. In this way SCOR is site-specific, able to respond to local incentives, and also able to incorporate both community and individual interests to increase the likelihood of profitability and sustainability for project interventions. Through activities aimed at careful resource use planning for uplands above irrigation reservoirs and canals, SCOR's aim is to increase local government understanding of interactions between upland and lowland resource use patterns and to strengthen farmer and local government shared control of these resources for sustainable increases in production.

Shared control of resources is at the core of the sub-project. The NAREPP Amendment Sub-project Paper identifies this as "the primary thrust of SCOR. All activities are focused either on increasing the control of user groups or on supporting and enabling those groups to productively exercise that control, and employ sustainable resource management practices" (USAID, 1993a, p. 11). By organizing and registering user groups primarily in the upper watershed of Nilwala and upland areas in Huruluwewa and linking them with resource development and protection programs of appropriate GSL

agencies, SCOR empowers local farming communities, increases their control over resources, expands their economic options, and stabilizes the use of fragile soils.

SCOR is engaged in testing alternative means of implementing a policy of shared control of resources through formal grants of limited tenurial rights to farmers participating in SCOR. When appropriate, on public land farmed by encroachers, SCOR attempts to link appropriate conservation farming practices with tenure for encroacher farmers through registration of their Farmer Organizations and through formal agreements, contracts, leases, and land-use permits regularizing their occupancy and use of public lands. Individual farmers participating in SCOR user groups qualify for various forms of tenurial agreements, including intermediate-length (5 years) and long-term (25-30 year) land leases and tree tenurial agreements guaranteeing the farmer rights to cultivate the land and to take the product from trees planted on the land. For other adjacent degraded lands in the highlands of Huruluwewa and the upper watershed of Nilwala, SCOR has chosen a strategy for helping the Department of Forestry to work with local communities to enlist them in enrichment and management of existing forests.

### SCOR STRUCTURE AND PRIORITY OUTPUTS

SCOR was designed to work initially in two watersheds with the possibility of expanding in Phase II to a total of four watersheds totalling approximately 40,000 hectares in the NCP and the SP. SCOR began in two pilot watersheds (Huruluwewa and Nilwala) representative of conditions in the dry zone NCP and the wet zone in the south. The sub-project consists of substantial Sri Lankan professional and specialist assistance through the Cooperative Agreement with IIMI to provide technical, organizational, financial, and training assistance in four focus areas:

- Forming, expanding and strengthening resource users groups;
- Securing shared control of resources by these user groups through formal agreements;
- Helping government, NGO, and private entities to better support, work with and monitor resource users; and
- Improving information and linkages among all groups and entities to promote sustainable land and water use (USAID, 1993b, p. 4).

By the end of the planned Phase II and PACD in 1998, SCOR is intended to have built upon considerable Sri Lankan experience in irrigation group management and agro-forestry to stabilize *chena* farming, improve highland farming practices through conservation farming techniques, and increase the productivity of both rainfed upland farms and paddy fields. SCOR is intended to regularize tenurial arrangements on encroachment *chena* lands in these upland reservation areas and to establish long-term conservation incentives through such devices as social forestry "tree-tenure" arrangements for newly planted timber and provision of fruit tree species for farmers to protect upland forest areas currently threatened by encroachment farming. In the words of the Cooperative Agreement, by PACD SCOR is expected to achieve:

- Formal agreements authorizing established user groups to manage the land and water resources of the target watersheds;

- An increase of \$2.5 million in private investment by resource user groups in target watersheds; and
- Demonstrable evidence of reductions in target watersheds in land degradation such as erosion, devegetation, and waterlogging in target watersheds (USAID, 1993b, p. 2).

Pages 6 through 13 of the Cooperative Agreement provide illustrative lists of outputs for the life of the Agreement. Specific numerical targets are set for numbers of farmer beneficiaries, resource user groups to be organized and registered, small grants to be made and farmers, and local officials to be trained. In addition the Agreement identifies general progress to be expected in tenurial arrangements and in research to test land use planning methodologies and validating conservation techniques in the Sri Lanka context. These output targets, reproduced below, will be considered later in this document as the questions of how best to sustain, replicate, and internalize SCOR technical and policy interventions are examined.

### **Forming User Groups**

- 250 user groups identified, organized and/or assisted to take joint responsibility for management of land and water resources;
- 1,000 user group members and entrepreneurs trained. An additional 30 officers in user group councils or associations will receive more extensive short-term training in country or overseas;
- 2 user group associations (councils) established at watershed level; and
- 175 small grants to user groups made and invested in common user group assets.

### **Securing Shared Control**

- Significant regulatory, procedural or organizational changes enacted to increase shared control by users;
- Land leasing/usufruct processes accelerated, reducing the processing time for most mechanisms by approximately 50 percent; and
- Demonstration of the benefits of authorizing user groups, joint management arrangements, and consolidated land management or production systems.

### **Improving Support to User Groups**

- Approximately 80 national, provincial and divisional officials trained in local level planning and user group formation, support, and collaboration; and
- 8 NGOs and other private sector firms actively providing technical, managerial and other information and support to groups.

**Improving Planning, Information Flow, and Interorganizational Linkages**

- Improved methodologies and tools developed and applied for multilevel integrated planning and coordination in pilot watersheds;
- Annual land and water management plans for two of the four target watersheds produced jointly by user groups, NGOs and government; and
- An improved land and water resource information and monitoring system designed.

## **CHAPTER THREE**

### **PROJECT PROGRESS AND ACCOMPLISHMENTS TO DATE**

#### **BACKGROUND**

The IIMI-SCOR Work Plan for 1993-1995 provides detailed work plans for each watershed and a set of annual and Life of Project outputs and output indicators. The IIMI-SCOR Fourth Quarterly Report of 1994 presents SCOR accomplishments in the first 15 months of project operations in Annex 12 (p. 41) and we reproduce it in Annex E. The intense and enthusiastic pace of activities of the SCOR field teams, so apparent during field site visits, is reflected in the accomplishments reported in this table. By most indicators of project output, SCOR targets for the first year of implementation have been met or exceeded, in some cases substantially. The nature of these indicators and our recommendations with regard to relative priority of SCOR-IIMI activities will be discussed in detail in later chapters.

#### **PROJECT ADMINISTRATION**

IIMI's mobilization of appropriate technical assistance appears to have been timely, reporting appears to be timely and informative, and procurement and auditing (conducted by the IIMI International Office) appear to have proceeded according to plan and in accordance with Cooperative Agreement guidelines. The Evaluation Team has found IIMI in compliance with the general terms of the Cooperative Agreement and the plans for SCOR implementation. Project spending appears to be on schedule and the funding budgeted appears to be adequate for the purposes of the project.

#### **THE SCOR-IIMI TEAM**

Toward the end of the first year of implementation, following recent government elections, both watershed technical assistance (TA) team leaders were appointed to senior GSL administrative positions, leaving these project TA positions empty. These vacant positions have not been filled at the time of this evaluation. It is our understanding that IIMI is open to filling these positions but has delayed action awaiting results of the midterm evaluation and decisions regarding commitments for Phase II of SCOR. It is understandable that professionals, especially of the caliber required to fill the two provincial team leadership positions, might be difficult to recruit in the absence of a renewed SCOR mandate and confirmed project time frame. It is our assessment that having senior leadership in each watershed contributed greatly in the first year, not only to coordination of field activities but also, more importantly, to elevating SCOR's agenda to Divisional, Provincial, and National decision- and policy-making arenas.

The Evaluation Team noted the need for additional attention to socioeconomic factors in land use planning in both watersheds and understands that this was originally planned and a professional included on the central SCOR-IIMI team. Apparently that position is currently vacant. The team is also concerned that SCOR-IIMI has not provided sufficient technical soil and water conservation support in the Nilwala pilot sites. SCOR-IIMI provides such professional support in Huruluwewa but to our knowledge does not have a resident soil scientist/soil conservation specialist in Nilwala.

**Comment:** In the event that SCOR is extended, IIMI should immediately recruit team leaders for the field teams who are able to carry SCOR's conservation and tenure agendas effectively to all levels of government. IIMI should also hire a Social Science Research Specialist on the central team and add a soil scientist/soil conservation specialist to the Nilwala team as soon as possible.

## **PROJECT REPORTING**

After review of SCOR-IIMI project reporting, the Evaluation Team believes that Quarterly and Annual Reports as well as occasional policy and research papers published by the SCOR-IIMI TA team provide important vehicles of communication and that IIMI should be encouraged to use their project reports as a means for stimulating high-level discussion of issues raised by SCOR, especially as they relate to alternative approaches to the central questions of conservation, productivity, and alternative instruments for establishing tenure rights. The team also suggests that IIMI review its monitoring program and consult with USAID and the GSL to arrive at a more modest and more useful set of project benchmarks and project impact indicators for future reporting.

### **Comments:**

- SCOR should use its project reporting to raise the central issues faced by SCOR — especially land tenure issues — and to present alternative solutions for discussion by government and donor decision makers.
- IIMI should revise its project monitoring reports to focus on a modest set of progress benchmarks and impact indicators useful to Project Managers at IIMI, USAID, and the GSL.

## **FORMATION AND DEVELOPMENT OF USER GROUPS**

A primary objective of SCOR was to assure that resource user groups have the ability to manage responsibly the resources turned over to them, given certain conditions in relation to their function, development, and sustenance. The project was to ensure that these conditions are fulfilled as far as the project area is concerned. Furthermore, the RUG was identified as the basic unit for action at the field level.

The program provides for the formation of 150 RUGs during the first phase of the project. Up to end of December 1994, 165 RUGs are reported operative, covering a total membership of 2,607 farmers.

The groups have been treated to appropriate awareness programs and they appear to have understood the SCOR concepts. This is a process that should continue over a considerable period, and should not be considered as a "once and for all" operation. Accordingly, we believe that further training programs are necessary for farmers, NGOs and GSL personnel to establish a firmer, more detailed knowledge of the participatory principles involved and the technical aspects of soil and water conservation.

## **SCOR TRAINING**

All of the SCOR staff have been given some training in SCOR participatory planning concepts, community mobilization and group formation, land use mapping, and financial management. Ten Divisional and field GSL officers have been sent to India to visit watershed management projects. Because no formal training programs have been held for farmers, user organizations, and agencies, it is not possible to assess the number of persons trained among beneficiaries. Because the project has emphasized informal "training," the only statistics available are those pertaining to "training opportunities." According to these statistics, training opportunities in Resource Use Planning, Organization and Financial Management, Marketing, Group Dynamics, Leadership, and Awareness Creation have been provided to 6,175 resource users in the Huruluwewa Watershed and 2,767 resource users in the Nilwala Watershed.

In this connection, the progress reporting in Annex 12 of the Fourth Quarter Report is misleading. Percentage achievements in training are given as 320 percent, 210 percent, and 2,240 percent. It would appear that either the program targets have been grossly understated at the outset or that there is a serious misunderstanding about what is meant by training. It appears that individual encounters between SCOR-IIMI team members and project participants are given weight equal to organized courses when counting training accomplishments.

## **SCOR SUB-GRANTS**

General difficulties associated with tardy release of local currency funds for sub-grants appear to have been overcome and small sub-grants to user groups, most of which are under \$1,000 for hand tools and seedlings, have been made to support conservation farming and agro-forestry interventions. The SCOR-IIMI Fourth Quarter Progress Report indicates that by December 1994 sub-grants from the Local Currency Account (total available funds are the equivalent of \$500,000) totaled 55 grants (26 in Nilwala and 29 in Huruluwewa) and Rs2,791,878 (approximately \$58,000).

The Cooperative Agreement and the Project Paper Supplement both prescribe a ceiling limit of \$1,500 (approximately Rs72,000) on the amount of any one sub-grant administered by the Cooperative Agreement recipient (IIMI) and made to user groups to support group activities. The IIMI-SCOR Work Plan for 1993-1995 (pp. 15-17) describes the objectives and general criteria for sub-grant awards. The work plan also describes financial limits on the size of sub-grants each SCOR institution may make to user groups or organizations: SCOR project team (with authority of the Provincial Steering Committee or PSC) = Rs25,000; Watershed Resources Management Team (WRMT) = Rs100,000; PSC = Rs500,000; National Steering Committee or NSC = over Rs500,000. These changes established guidelines on grant-making authority and set new sub-grant limits needed to support enterprise and market development initiatives planned by the SCOR team.

The Cooperative Agreement requires IIMI to spot check user groups to assure conformity with sub-grant use plans (apparently a matter of routine attention by the Cooperative Agreement recipient to date) and requires an annual audit of the Cooperative Agreement recipient to include sub-grant administration. Although there is evidence in the financial report for the SCOR Third Quarterly Report that audit funding was expended during the quarter, there is no mention of the audit in the body of the report, nor is there any mention of the audit results for sub-grants component.

## NGOS AND MARKETING COLLECTIVES

Four NGOs have been formed in Nilwala watershed to assist user groups and user associations of user groups to organize community labor for enrichment planting of hardwood seedlings in the upper watershed reserve and to help organize *kitul* tappers for collective marketing. SCOR-IIMI has been less successful than they had hoped in organizing production companies, forming rural-based commercial cooperative activities, and linking farmer organizations or user groups to new markets. Related to this, fewer sub-grants than planned have been made to user groups for commercial activities. SCOR is still in its early days. The Evaluation Team believes that a slow start in these complicated commercial ventures may be counted as a blessing. Although there is evidence that enterprise development advice might be useful, enterprise development is not central to SCOR's mandate. Some of the needed services might be provided by local service organizations such as those the team met in Nilwala. USAID might also consider how other projects such as Agro-Enterprise and Mahaweli Enterprise Development might be able to assist SCOR user groups and communities in their market development efforts.

**Comment:** SCOR should consider using sub-grant funds to support initiatives by local service organizations (NGOs) such as encountered in Nilwala providing enterprise development and marketing assistance to user groups and individuals.

As indicated above, most sub-grants are small and have clear purposes related to the technical conservation farming activities promoted by SCOR. Nevertheless, even these grants have taken more than one form deserving of scrutiny. In Nilwala small conservation farming grants have been used as in-kind contributions by SCOR to user groups to get their activities started (hand tools and seedlings, for example); in Huruluwewa they have served as cash grants deposited in bank accounts opened by group leaders and treasurers and described by SCOR TA team members and catalysts (the village development workers) as revolving funds. Huruluwewa user groups have been told that they must replenish these accounts with earnings from their new cropping patterns to assist additional farmers in their expanding group.

On the surface the Huruluwewa approach offers an appealing means of stretching limited resources; and, at least superficially appears to have been accepted by the Huruluwewa user groups met in the field. In practice however, the Huruluwewa farmers can hardly be described as entering into this arrangement with full awareness of its implications. Experience with other projects of this type indicate that farm incomes will not rise so quickly nor so much that repayment is easy. In addition, fairness issues will arise as some user groups feel the burden of "repaying" their working advances to their group account while other user groups have received outright "in kind" grants.

**Comment:** Sub-grant funds should be used to provide grants to support conservation farming interventions and should be standardized as much as possible as to the amounts per hectare provided within any sub-watershed situation.

## SUB-GRANTS USED AS LOAN COLLATERAL

SCOR-IIMI is also beginning to experiment with sub-grant subsidies for development loans (currently through the Bank of Ceylon) that deserve careful scrutiny. Sub-grants of considerable size have been made or are planned as a means of collateralizing leveraged bank loans of several times the

size of the sub-grant to finance user group or farmer organization business ventures (for example, soya bean and sesame seed marketing in Huruluwewa). In Huruluwewa, one conservation sub-grant has been made for Rs326,250 (\$6,797) and another for credit and production for Rs250,000 (\$5,208). The latter sub-grant was in fact reported in discussion to have reached as much as Rs350,000 (\$7,290) in January 1995. The Evaluation Team is concerned about the equity and sustainability of this type of activity. Furthermore, it is of concern that such subsidized enterprise development loans may be counter-productive to more appropriate economic development efforts to assure small businesses and entrepreneurs equitable access to bank credit at current market rates.

**Comment:** SCOR should return to a pure grant model, making modest sub-grants to resource user groups to assist adoption of new conservation technology and to local service organizations offering enterprise development and market identification assistance.

### SOIL AND WATER CONSERVATION INTERVENTIONS

The goal of the SCOR sub-project is "to increase the sustainable productivity of the land and water resources base in pilot watersheds." To protect *chena* land approved for annual crops, resource user groups being formed in the two pilot watersheds are being encouraged to adopt new production techniques for annual crops that conserve land and water resources, and to undertake agro-forestry in adjacent protected land.

World Bank findings show that "yield increases from low cost contour cultivation alone can be over 50 percent, with resulting improvements in soil moisture, enhancing the effectiveness of fertilizer additions" (Magrath and Doolette, 1990 cited in Fleming, p. 20). Citing his own work, Fleming reports that benefit-cost analyses from one study in Nepal revealed "on-site benefits of forest, grazing and paddy management were nearly double the costs of the programme" and that "forest productivity would double with simple management (without costly reforestation), 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" (Fleming, p. 21).

Among the conservation options available, current choice favors vegetative (biological) over mechanical methods (bunding, constructed terraces, and check dams are examples). Economic comparisons repeatedly reveal that vegetative methods are considerably less costly and often at least as effective. Again quoting Fleming, "With the benefit of economic analysis and a realization that impacts on productivity are a key measure, it is becoming clear that low cost, vegetative approaches are more efficient and sustainable ways to maintain soil and moisture than mechanical structures" (Fleming, p. 22).

SCOR has chosen a mix of vegetative (*Gliricidium* hedge rows, alley cropping and living fences, vetiver grass planted on field borders and terrace lips, *Gliricidium* and packed mulch barriers) and mechanical measures (earth bunds and ditching to manage runoff) with vegetative predominating, especially in the more steeply sloping lands in Upper Nilwala watershed. In Huruluwewa, SCOR participants are working slopes rarely exceeding 4 to 7 percent where simple earth bunds, alley cropping for soil and water retention, and green manure mulching are adequate. In Nilwala, slopes range from 20 to 60 percent. Here, in addition to the methods employed in Huruluwewa, organic, double hedgerow barriers are used as substitutes for traditional rock retaining walls in tea small holdings.

To protect and increase production from more steeply sloping *chena* land abutting annual crop cultivation in both pilot areas, SCOR and the Department of Forestry have combined agro-forestry plantings of mixed timber hard woods (such as teak and mahogany) and fruit trees in buffer zones on the intermediate slopes with tree tenure contracts entitling resident farmers to the products and the timber from the trees they have helped plant and protect. On upper slopes from which streams supply communities' water, SCOR is assisting the Department of Forestry and community service organizations to enrich timber plantings to replace the previous hardwood forest.

Up to the end of 1994, more than 2,607 farmers were in 165 groups undertaking 33 different conservation and production activities (IIIMI, 1995a, Annexes 9 &10).

In the Huruluwewa area, homestead development and conservation farming, animal husbandry, women's activities, *chena* stabilization, agro-wells, various agro-forestry initiatives, and integrated water use planning were the predominant activities. By the end of the fourth quarter, 1994, approximately 1,100 families were involved in some type of soil and water conservation plan or treatment on more than 1,200 hectares of land. In addition to these families, another 3,000 families in the command area of Huruluwewa tank participated in a decision to begin rice cultivation early in the *Maha* season to save stored tank water, a decision facilitated by SCOR staff.

The targets set for the first phase of SCOR (1993-95 Work Plan) were to incorporate 4,666 hectares and 3,814 farm families in conservation interventions in Huruluwewa. If one counts the Huruluwewa Irrigation Reservoir users groups (organized prior to SCOR intervention), SCOR has exceeded these targets. But a more realistic approach is to look at the 10 non-command area sites, where SCOR has worked intensively. In these areas SCOR has reached approximately 40 percent of its Phase I targets in families and hectares.

In the Nilwala area, the most important SCOR conservation interventions are smallholder tealand conservation, stream reservation conservation (agro-forestry), home gardening, and an assortment of other minor crops, nurseries, and animal projects. The number of families involved in these activities (at least as active group members involved in resource planning) was up to 1,135 by the end of 1994, or 40 percent of the Phase I target. Also, 420 hectares of land have been incorporated into conservation treatments, or 25 percent of the Phase I target.

The Evaluation Team feels that SCOR's relative physical progress in promotion of new practices and activities has been quite rapid for a conservation project. Actually, the relatively low percentages of targets achieved in conserved land reflect inflated, unrealistic targets, not poor performance. The team urges caution in pushing even simple conservation practices too fast; time must be allowed for adaptation and evaluation of these practices in local conditions. There is a possibility that farmers may abandon SCOR conservation farming innovations if the SCOR catalysts and staff move on too quickly to new sites.

Furthermore, some inadequate approximations of conservation farming methods may be copied in other areas before the process of adaptation and adoption is complete, causing rejection of conservation before it has a chance to get started. For example, there is already evidence that enthusiastic local officials have chosen to copy the Huruluwewa Tract 6 common pasture concept in every other Division of the NCP. Yet the communal pasture we saw had barely been initiated and already had serious deficiencies that need to be corrected — its conservation aspects are neither properly implemented nor internalized yet by either volunteer catalysts or farmers.

**Comment:** The SCOR sub-project must move decisively and methodically to consolidate its initial progress in conservation farming. Farmers, catalysts, and local officials must be thoroughly trained in how to establish, stabilize, and maintain the conservation farming practices. Farmers must participate in the evaluation and modification of conservation innovations. Eventually, the best conservation farmers will be able to motivate and train other farmers in the techniques they have learned. This process requires several years of concentrated effort in the best of circumstances.

## **UTILITY OF SCOR MONITORING SYSTEM**

### **Information Flow and Feedback for SCOR Planners and User Groups**

The SCOR project uses a three-level system for collecting and generating information: first, the catalysts gather field information with the user groups; second, the SCOR field professionals gather and process information from all the user groups in their area; and third, the SCOR Colombo staff analyze information from the whole sub-project, and provide reports to the Sri Lankan provincial and local governments, to USAID, and to other agencies.

The primary effort in information generation at the user group level has been the preparation of land use and land tenure maps. These maps are sketches that depict the approximate boundaries of farmers' parcels and the general land use categories in their immediate micro-watershed on a simple base map that includes roads, rivers and streams, and tanks. These maps have been used to generate land use plans with the user groups, providing a before-and-after graphic that effectively captures the user groups' natural resource management goals.

The village land use maps are digitized using the IDRISI geographic information system, and stored by SCOR field offices and in Colombo. Village user groups have copies of their land use plans either as large color sketches or small black-and-white computer-generated maps. The SCOR M&E system's ultimate goal is that user groups will monitor their achievements in a written, quantified form. Currently, few groups do this, and catalysts, research assistants, and professionals do the bulk of basic information collection.

Feedback on SCOR goes to the district and provincial governments in the form of quantitative quarterly progress reports in Sinhala. Policy background papers, usually only one to two pages, are prepared for the Provincial Steering Committee as necessary. The National Steering Committee members all receive copies of the SCOR quarterly reports in English that are prepared for USAID, and policy background papers of several pages (the recent four-page paper on "State User Agreements" is an example). The SCOR staff in Colombo have also prepared two newsletters, two brochures, and several professional articles on the project's strategy and early accomplishments.

### **Internal Management Information System: Monitoring Project Inputs and Output**

The SCOR project monitors project inputs and outputs through five databases:

- User group database;
- Training database;

- Host country contribution database, on contributions from Sri Lankan agencies;
- Market database; and
- Grants database, which includes information on the user sub-grants.

A planned database on land and water resource physical indicators is still in the design stage, although data collection has been under way for almost one year.

Financial reporting is based on data from a separate Financial Monitoring System (FMS). The work plan suggests (on page 21) that a FMS will monitor expenditure in a detailed manner. However, the Fourth Quarter (1994) Progress Report does not provide data in accord with financial monitoring formats prescribed in the FMS. From the data as presented, it is not possible to assess the amount of GSL and local support in terms of costs in comparison with targeted amounts.

The fundamental reporting document on SCOR activities and accomplishments is the quarterly "SCOR Progress" report prepared as a requirement of USAID, and also distributed to the National Steering Committee in the Sri Lankan government. This document includes a summary table of financial performance and 15 basic output indicators. The data on output are drawn from an annex that provides quantified data on performance in more than 160 bewildering indicator categories.

**Comments:**

- The land and water resource data collection strategy needs to be reviewed and simplified, so that the database can be made functional. The volume of data collected is unwieldy, and many parameters measured are not essential. For example, for water quality measurements, samples from seven points in the Aninkanda sub-watershed of Nilwala are collected in every major rain, and five parameters are measured in the laboratory. One simple parameter, turbidity, easy to measure in the field, would be a sufficient indicator of land use impacts on the watershed, and one or two upstream sites probably sufficient.
- The huge variety of performance indicators used by SCOR is indicative of the sub-project's increasingly diffuse definition of natural resource management. The lack of early progress on a performance indicator should be analyzed to identify activities that can be omitted from the future work plan.
- Care should be taken to verify progress on the ground. Catalysts now have an average of nearly 10 groups each to assist and monitor, and on-farm data collection threatens to become unmanageable. For example, a review of the catalysts' field book in the Bodiniya tea smallholder's society showed less than half of the targeted 400 members had actually implemented even a small part of the soil conservation measures recommended by SCOR (only 25 percent had implemented 2 or more of the 8 recommended practices). However, SCOR's Fourth Quarter Report says that 40 percent of the target area for that sub-watershed (Diyadawa) is now fully implemented.

## Monitoring and Evaluation Framework

The Monitoring and Evaluation Framework introduced as Annex 1 to the 1993-95 SCOR Work Plan is weak in its definition of quantifiable achievements of the two-year Cooperative Agreement. The 1994 Fourth Quarter Report includes more quantifiable indicators, but the categories of indicators do not correspond to the original Framework. The Team believes that SCOR and all who are interested in soil and water conservation in Sri Lanka would benefit by attention to more quantifiable indicators of project impact. Table 3.1 offers a modest example of the sort of indicators the Team has in mind.

TABLE 3.1

### EXAMPLE OF MONITORING AND EVALUATION FRAMEWORK

| PROJECT GOAL, PURPOSE  | OBJECTIVELY VERIFIABLE INDICATORS*   | SUGGESTED SIX-YEAR VERIFICATION*  |
|--|--|---|
| 1. <u>Goal</u> : To increase the sustainable productivity of the land and water resource base in pilot watersheds. | <p>Increase in percentage of pilot sub-watersheds using sustainable land use practices: (stabilized <i>chena</i>, agro-forestry, conservation farming practices on homestead plots).</p> <p>Increase in land productivity per unit area.</p> <p>Increase in land irrigated under existing tanks.</p> | <p>Increase in number of baseline and actual village land use maps.</p> <p>Increase in average yield for major annual crops (30% above baseline).</p> <p>Increase in net value of annual production/ha.</p> <p>Increase in standing value of tree crops/ha.</p> <p>Increase in organic matter and nutrients, reduced erosion.</p> |
| 2. <u>Purpose</u> : Increase shared control of land and water resources in pilot watersheds.                       | <p>Policy changes to facilitate user control of state land.</p> <p>Divisional-level government using watershed-based WRMT with regular farmer participation.</p>   | <p>New formal regulations or laws at national or local levels on leasing land.</p> <p>Increase in total area on long leases to farmers for stabilized <i>chena</i> or tree crops.</p> <p>Regular WRMT meetings with written minutes after SCOR withdraws.</p>   |

\* "Participatory action research" is a central organizing theme of the SCOR strategy. Participatory action research engages the project participants — farmers, local officials, and policy makers — in the research work while the project is being implemented. The dual objectives of action research are to "generate knowledge" and "change resource management," and documentation of the adoption of new management techniques is a priority.

## **ACTION RESEARCH**

The specific objectives of the SCOR action research program are to:

- Obtain baseline data;
- Monitor and evaluate project interventions;
- Provide useful guidance to Sri Lankan farmers, planning agencies, and policy makers during the implementation of the project;
- Document the process of management change; and
- Generate new project and policy models for Sri Lankan land and water management.

Research is progressing on schedule. Four studies are already completed and sixteen are on-going under the first phase of SCOR. This research is grouped in five categories, and the budget for each category is listed in the Table 3.2.

The Fourth Quarter Report for 1994 lists 22 distinct research projects, with a cost of Rs3,791,487 or approximately \$80,000. Two land-use studies being performed by the Land Use Policy Planning Division (LUPPD) have been consolidated, and ground water research has been subsumed in "integrated water management," — thereby accounting for the apparent reduction in number of projects from 22 to 20.

Fifteen of these research projects are being carried out by contracted specialists or students from government, university, or IIMI, and coordinated by SCOR professionals. Part of the research is based on the database being generated for monitoring and evaluation, and SCOR team members are heading up the remaining five research projects on policy research and a baseline survey of socioeconomic indicators.

Baseline studies have accounted for 35 percent of the expenditure on contract research. As expected, land and water management studies come next with 26 percent and are followed by production and income generation studies, institution and organization studies and policy studies, in that order. It is noted that nearly two-thirds of the contract research activities are focused on the Huruluwewa watershed, where all of the water management studies are being conducted.

A few contract research outputs have not yet been delivered according to targets, and one SCOR staff position in socioeconomic research is vacant, causing delays in that sector.

At the level of field application, preliminary research results on alternatives for integrated water management in Huruluwewa watershed have been used by the Huruluwewa Watershed Resource Management Team in decision making, and the Nilwala tea technology adoption study is being used to orient an interinstitutional research initiative. However, most research projects are still too incomplete to be influencing the project implementation.

**TABLE 3.2**  
**DISTRIBUTION OF RESEARCH FUNDS BY TOPIC AREA**  
**IN SCOR FIRST PHASE (1993-1995)**

| Type of Research                  | Huruluwewa (Rs)  | Nilwala (Rs)     | Total (Rs)       | %           |
|-----------------------------------|------------------|------------------|------------------|-------------|
| Baseline Study                    | 590,820          | 738,330          | 1,329,150        | 35          |
| Land/Water Management             | 989,587          | ----             | 989,587          | 26          |
| Production and Income             | 414,350          | 370,500          | 784,850          | 21          |
| Institution/ Organization Studies | 400,200          | 287,700          | 687,900          | 18          |
| Policy Research                   | Main Project     | Main Project     | ---              | ---         |
| <b>TOTAL</b>                      | <b>2,394,957</b> | <b>1,396,530</b> | <b>3,791,487</b> | <b>100%</b> |

In summary, research activities undertaken to date seem relevant and useful to the overall goals of the project. The topics cover all of the activities being undertaken by the project and have been carefully selected by the core members of the SCOR team supported by IIMI international staff after a very elaborate review procedure. The total research budget is relatively small. Money allocated for research studies comprises only 4 percent of the total SCOR budget.

The SCOR's research component has the potential to generate important guidance for international donors and Sri Lankan Government agencies involved in natural resource management. The innovative nature of the program and the strong research capability of the implementing agency, provide convincing arguments to continue existing research.

**Comments:**

- SCOR should continue its action research with particular attention to validating project conservation activities and to documenting:
  - Impacts of land tenure arrangements on productivity and adoption of conservation interventions; and
  - impacts of SCOR interventions on farm incomes and generation of alternative uses for family labor.
- Some studies being done in Nilwala should also be undertaken in the Huruluwewa area (to identify different levels of adoption of new technologies and to examine reasons for the differences and also reasons for nonadoption).

- **SCOR should provide opportunities for research workers in government research institutions doing research on subjects of interest to the project to test their results within the watersheds.**

## **CHAPTER FOUR**

### **FORMING, EXPANDING, AND STRENGTHENING RESOURCE USER GROUPS**

#### **GROUP DEVELOPMENT**

In the context of small-scale farmers in Sri Lanka, there is no alternative to group activity if any progress is to be made in improving the living standards of the community or in introducing conservation measures for land and water resources. Hence, the user-group strategy is appropriate for implementing the SCOR concepts.

Up to end of December 1994, 165 groups are reported as operative, covering a total membership of 2,607. The status of these groups in terms of their development can be seen in Table 4.1. The percentages do not total 100 because 24 groups representing 14 percent of the total have not satisfied the minimum criteria.

Phase I ends in 8 months time. Over 50 percent of current groups were already operative at the end of the second quarter but only 4 percent of the total number of user groups have achieved Status A by the end of December 1994. Development of user groups is inherently a time-consuming process requiring much effort and follow-up activity. On a conservative basis it can be assumed that it could take 2 to 3 years on average for a group to achieve full maturity.

In light of this, it would appear that although the LOP target of forming 500 user groups is possible, many will not reach Level A maturity.

#### **Comments:**

- It may be prudent to target a lesser number of groups per year for the first 4 years of the project and leave the last 2 years of the project period to stabilize these groups and ensure that they are fully developed and offer a model to be used by local line agencies and service organizations before the end of the project.
- During the last 2 years of the project SCOR could experiment with providing minimal assistance to local authorities and designated service organizations to form and support groups. This is an important step in strengthening local capacity to establish and support the user organizations and the coordination mechanisms to ensure sustainability.

**TABLE 4.1**  
**RESOURCE USER GROUPS BY LEVEL OF DEVELOPMENT**

| Category | Characteristics<br>(Cumulative)   | No. in<br>Category | % of Total |
|----------|---|--------------------|------------|
| D        | Group formation<br>Reorganized leadership<br>Regular Meetings with 60%<br>participation<br>Records minutes of<br>meetings | 77                 | 47%        |
| C        | Has a Group Fund<br>Has agreed targets to<br>achieve  | 39                 | 24%        |
| B        | Invest money, labor, and<br>time on related activities<br>Self-monitory and<br>self-assessment                            | 19                 | 11%        |
| A        | Has institutional/legal<br>recognition  | 06                 | 04%        |

### GROUP REGISTRATION

There is lack of clarity in the use of the terms, user group, user group association, user organization, and sub-councils as used in the Project Proposal and in the Work Plan and Progress Report. Whatever terminology is used, a group of users joined into an association will form a users organization. The important question is how such an organization could receive legitimate status so as to engage in the type of activities anticipated by SCOR. Such a users organization could generally register under the Agrarian Services Act 1979, which provides for the formation of farmers' organizations or groups with a minimum composition of 25 members. It appears that most of the "groups" under SCOR will not be eligible for legal recognition under the Agrarian Services Act because their numbers are less than that prescribed for registration. The question then is whether such a small group can achieve any legal status on it's own.

**Comment:** Because it appears unlikely that groups with membership below 25 will be able to register, legal recognition will only be possible if the group federates into a larger organization.

This problem has been satisfactorily solved in the command area of Huruluwewa under the already existing farmer organization network. Here small field canal groups of 15-20 farmers are federated at the level of the distribution canal where a Distribution Canal Organization (DCO) is formed. The potential membership of such an organization ranges from 100-200 farmers. DCOs receive legal recognition under the Agrarian Services Act by registration under Clause 56 A of the Act. Once they achieve the prescribed status of maturity they are eligible for registration under Clause 56 B of the Act.

This latter registration elevates them to the status of a private company. They can sue or be sued in terms of the law.

The federation of field canal groups into a DCO has an excellent rationale because all members of all the groups under any distribution canal share the same source of water. That, and the fact that they have many areas of common activity like agricultural inputs, operation and maintenance of the distribution canal, credit, and marketing, make them quite effective in serving the individual and collective interests of the DCO members.

In considering the small groups in the upland areas of the project, one difficulty is that these groups have varied interests. For instance, the 99 user groups formed in Huruluwewa have 13 different interests. Combining them into useful and viable organizations poses a serious problem. They may have some links by way of a coordinating arrangement but they may not be able to function as a cohesive organization. Further, unlike the case of a DCO, where all its members live in close physical proximity, the same may not be the case with several of the user groups in SCOR. The question of how all these user groups are to receive legal status is a question that should be addressed seriously. Federating several groups into viable organizations of a size adequate to give status and capability is obviously one answer. Modification of registration requirements is another.

When federation is needed for registration, combining groups within a sub-watershed appears to the Evaluation Team to make the most sense. Combining users organizations along Gram Niladari area lines, while administratively simpler, does not have the advantage of an organization that brings smaller groups from within the same physical catchment area together for planning purposes.

Two service organizations have formed at Nilwala, one in each of two of the sub-watersheds, but these appear to be informal organizations. They have been formed by "federating" the various groups within the sub-watershed area. Although some of these groups are newly formed for conservation of natural resources, the others are existing farmers organizations registered with the Department of Agrarian Services or with the Tea Small Holders' Authority. These groups number about 15 in each sub-watershed at the moment, and have widely different interests. Such organizations are more likely to be sustainable if they share common interests as well as one catchment area.

It would be useful to establish a forum where the activities of all these groups can be coordinated. Such a forum could serve as a mechanism for collective action when such action becomes necessary. SCOR has already formed the Watershed Resources Management Team at the Divisional level. A similar body at the sub-watershed level could be of considerable assistance in performing this coordination function, possibly a sub-WRMT.

**Comment:** The present WRMT for each watershed should be expanded to have representatives from each of the service organizations suggested above. This will ensure that the interests served by these groups will have adequate representation in the WRMT.

## **DEVELOPING USER GROUP TECHNICAL CAPABILITIES**

From evidence in the field it appears that the new user groups are developing the capability to plan and implement conservation-oriented production activities. However, it was also noticed that the group leaders are largely dependent on the catalyst. This is to be expected in the formative years but the danger of continued dependency on the catalyst (who is an outsider) should be borne in mind. Rural farmers are very enthusiastic and readily cooperate in any new activity they think will help them. Such enthusiasm should not mislead the project team to think that leaving behind a sustainable viable and independent group will be an easy matter. If this position is understood, particular strategies should be introduced to ensure that there is a programmed phasing out of the catalyst, identifying detailed activities to be transferred to the full control of the group on a scheduled basis. Such a program could be negotiated between SCOR and each group on mutually acceptable terms and efforts made to adhere to the time targets agreed to.

On the whole the groups are, in fact, changing their land use patterns and adopting appropriate land and water resource conservation practices. However, it was noticed that such developments were not seen in all the individual holdings among the groups' members. Although progress was satisfactory in some plots, others were only in the initial stages of adopting the new measures. There were wide differences in the areas being developed in each of the plots. It appears that it would be better to plan the development of each plot separately, taking into account the keenness of the settler, the resources available to him, and other vital factors. The targets set for each plot would vary and the program of land development for the whole group could be a summation of the targets for each of the plots. A more realistic monitoring could be done if such an arrangement is made.

## **SUSTAINING SHARED CONTROL OF RESOURCES**

Devolution of decision making authority to farmers, as a principle, appears to have been accepted in Sri Lanka for some time now. This is evident from the fact that most government programs linked to farmers are based on this concept. Most donor-funded development projects in the agricultural sector in the recent past have stated this in the relevant project documents. However, the reluctance of some government officials to actually divest themselves of authority is also well known. In this respect SCOR may not be an exception. SCOR's shared control approach officially sanctions farmers' access to government lands and grants them considerable latitude in land use decisions without actually giving farmers title to the land they till.

Although many government officials will not openly oppose the empowerment of farmers' organizations, they may not be enthusiastic about seeing this happen in practice. From the Evaluation Team's experience during its meetings with government and provincial authorities connected to SCOR's activities, it appears that they strongly support the strategy of sharing decision-making authority with farmers. It will be SCOR's task to create the necessary institutional mechanism for such a sharing of responsibility and ensure that it is fully stabilized, effective, and sustainable. Although some institutional arrangements are already being experimented with at the various levels, the soundness of some of these arrangements should be examined closely, especially at the lower levels. Some arrangements appear to be informal. This is as it should be at the start of the project, but adequate steps should be taken to make them statutory at the earliest possible time so that the project will have sufficient time to assist in stabilizing operational procedures.

## CHAPTER FIVE

### APPROPRIATENESS, EFFECTIVENESS, AND SUSTAINABILITY OF SCOR TECHNICAL INTERVENTIONS

#### THE SCOR-IIMI STRATEGY

##### Incentives for Conservation

Appropriate conservation practices can arrest soil degradation, increase soil fertility through better retention of organic matter and nutrients, increase soil moisture for plant growth, and reduce irrigation requirements. Good conservation practice can result in increased yields and income per hectare; and can reduce off-site costs by reducing chemical and nutrient contamination of water supplies from organic and inorganic fertilizers, pesticides, and herbicides, and reducing sedimentation and siltation of dams, reservoirs, and irrigation canals. These are accepted truths when discussing soil and water conservation. But by themselves, they are not enough to ensure that individual farmers practice soil and water conserving strategies.

It is generally agreed that to be successful any soil conservation strategy must begin from an examination of the incentives for adopting the recommended conservation practices. Among possible incentives are acquisition of land tenure or usufruct rights; profitability of the recommended conservation practices (for example, reduced cultivation costs in the case of minimum tillage combined with earning opportunities for labor released from intensive cultivation, and increased yields from retained moisture and increased soil fertility resulting from green manure mulching); and external subsidies to encourage adoption of recommended practices (such as free hand tools, free seedlings, or payments for land set-aside).

In planning incentives for conservation practices, it is vital to understand the economic situation of the farmer and his family, the extent of their dependence on the farm for their livelihood and their ability to and interest in investing in intermediate- to long-term, yield-increasing technologies. In the case of SCOR, some key information is lacking. In particular, the data on farm family economics are incomplete, and data on the yield and profitability effects of the main conservation practices are still being developed. Furthermore, it is not clear whether SCOR's strategy is to motivate farmers primarily through increased tenure security, through productivity improvements, or simply through access to sub-grant funds.

**Comment:** SCOR should clarify and enunciate its incentive strategy and test its assumptions before attempts to replicate the work begin.

##### Choice of Pilot Areas

Among SCOR's objectives is to pilot-test and demonstrate new techniques and strategies related to increased production and conservation of resources. Ideally, the pilot areas selected would be typical of other locations to which tested interventions could be generalized. Much of the area chosen by SCOR in Nilwala and Huruluwewa meets this requirement. However, there are aspects of the Huruluwewa watershed that make it an unusual case. The Huruluwewa situation is complicated by competition for

irrigation water being conveyed to the watershed by a 20-mile-long canal from another catchment. Efforts to respond to illegal tapping of water from this canal have come to occupy a significant place in SCOR's portfolio of activities in Huruluwewa.

### **Participatory Approach And Village Catalysts**

Participatory approaches to mobilizing farmer acceptance of improved soil and water conservation techniques begin by involving communities and individuals in analyses of erosion, soil management, and water loss problems and then progress to seeking acceptable solutions. As Fleming points out, this approach puts "field extension agents and villagers on a common footing so that implementation schemes are realistic with a good chance of local acceptance and ultimate success. Although this process takes longer than 'top-down' implementation, such as the construction of check dams or forest plantations on government reserves, experience has shown that it pays off in the long term" (Fleming, p. 19). Fleming also cites work on a USAID-funded project in Nepal (Fleming, p. 19):

Villagers discuss options that they feel will help to resolve their problems and with the team draw up an action plan, based on their own time and resources and the available government inputs, programs, and resources of the extension departments represented. This approach was used in Nepal to formulate several resource conservation components of a USAID-assisted project in Mustang Province of Nepal, and the final evaluation indicated that long term success was approximately proportional to local involvement from the inception (RCUP evaluation, 1986, cited by Fleming).

SCOR-IIMI has adopted a participatory approach to conservation planning and has employed catalysts trained and financed by SCOR to help form user groups, to help them make resource use maps and plans, and to guide farmers as they implement recommended technical interventions. These young people, men and women between the ages of 25 and 35, reside in the SCOR pilot areas and have almost daily contact with project participants.

It is apparent that the successes seen in the project area are largely due to the effective field work of SCOR catalysts. What is required before SCOR ends, however, is to find ways of transferring the catalysts' activities to appropriate GSL institutions or NGOs.

**Comment:** In this regard, the SCOR-IIMI strategy of fielding catalysts exclusively from its own staff needs to be reviewed. As SCOR progresses and solidifies its approach and the gains it has made, thought needs to be given to ways in which NGOs and appropriate GSL District and Provincial agencies can become involved. Indeed, this is part of a much needed reexamination of IIMI's role as the *implementor* of SCOR. The Evaluation Team believes that in the later part of Phase II, IIMI needs to find ways of working in an increasingly lower-profile consultative and advisory role as it guides other institutions to helping user groups develop their resource use plans and implement the best of the SCOR conservation interventions.

### **SCOR's Land Use Mapping**

Adopting a technique proven effective in successful watershed planning and rehabilitation projects throughout South and Southeast Asia, SCOR's key technical innovation in local land use planning has

been the introduction of participatory land use mapping. The emphasis on graphical, rather than numeric, data, and the involvement of the user groups and entire communities in gathering the basic map data, has proved to be a powerful tool for coordinating and changing land use patterns in small communities. To help user groups visualize the priority land use changes they want, SCOR pilot communities have been helped to create maps of their existing and proposed land use. They are assisted in this by the SCOR catalyst who is also there to help in referring to these maps at planting time.

SCOR's land use mapping system appears on the surface to be a computerized system depending upon sophisticated methods and technology. Fortunately this is not really the case. Mapping of property boundaries and land use patterns begins with sketch maps, using local landmarks, drawn by SCOR catalysts with the assistance of local farmers. The sketch maps are then improved by draftsmen and only then rendered in finished form with transparency overlays using computer technology.

**Comment:** SCOR-IIMI can use the time remaining in the project to experiment with simplified ways of producing resource use maps. These are essential tools of the SCOR approach and do not rely upon sophisticated computer technology. It is important that users realize this and learn the basic mapping skills mastered by the SCOR catalyst.

## TECHNICAL REVIEW OF SCOR CONSERVATION ACTIVITIES

### Huruluwewa Pilot Area

#### Homestead Development and Conservation Farming

Homestead development and conservation farming are the most frequent SCOR interventions in Huruluwewa. Conservation farming technologies observed in the field visits include contour bunding, incorporation of crop residues and composted manure, mulching, alley cropping with legume trees, and crop diversification including tree crops.

Most of these activities are intended to conserve scarce soil moisture, increase levels of organic matter, and in some cases reduce soil erosion from sloping fields. These are appropriate conservation measures in the rainfed zones, and should increase the productivity of the rainfed field crops while contributing to soil fertility maintenance.

As compared with the agro-forestry activities, which appear uniformly of high quality in both watersheds, the quality of the conservation farming work in the field is variable. Some of the homestead contour bunding in Garandiya Ulpotha, for example, is excellent. But in many areas the bunds are not on correct contour, or have been made for nonconservation purposes such as marking property boundaries. Very few bunds are stabilized by permanent vegetation. In many areas the field crops between the bunds are not planted on contour, thereby missing the moisture conservation potential of this practice.

Promotion of the contour bunding practice was rushed, and technicians were brought in to mark contours with sophisticated levels, rather than teaching the farmers to do this work themselves. Reasons for farmer's initial adoption of these conservation practices apparently are related to their enthusiasm for

the new technical and economic resources coming into their communities with SCOR, but the precise factors are not clear.

Several questions need to be asked about the widespread promotion of contour bunding in the Huruluwewa watershed:

- Are the farmers able to mark contours, and construct and establish this technology on their own?
- Are earth bunds more appropriate than vegetative barriers on contour in this environment? Will they resist erosion or be constantly degraded and require onerous maintenance? On what slope and soil conditions are they appropriate?
- Will the moisture and soil retention effects of the bunds make a economically significant difference in rainfed crop productivity?

**Comments:**

- Monitoring of crop yield effects of bunding, crop residue incorporation, and mulching should include side-by-side comparison plots where the impact of these technologies on crop productivity and soil characteristics can be evaluated on the same soil and slope by farmers and technicians. Comparisons with general yields in the area are not valid, and not convincing to farmers.
- Grasses are generally preferred for bund stabilization, either alone or in combination with trees, but trials should be done with various species, not just vetiver grass. Other species with forage or mulch value may be of more use to the farmer, and this may compensate for some of the land lost to the bunds. Grass barriers alone will be more economical than earth bunds but may lose runoff.
- Farmers must be thoroughly trained in how to establish, stabilize, and maintain their conservation farming practices on their own.
- Other projects of this type have had success with farmer and user group competitions to solidify understanding of these new technologies. SCOR could experiment with inter-group competition and use part of the sub-grant fund to award prizes to the best groups. In this vein, SCOR might consider sending key farmers from several communities in each pilot area to other Asian countries where they can observe similar techniques being practiced.

**Livestock and Pasture Development**

Livestock and pasture development activities are the second most common SCOR intervention in this watershed although the Evaluation Team observed only two sites — stall-fed goats and a woman's group pasture development site for cattle. These activities are intended to diversify farm production, produce manure and increase milk production.

The pasture development site was hilly state land in scrub jungle that had been cleared and burned down to bare soil and partially planted to a forage grass recommended by the Livestock Development

**Agent.** Neither the cut brush barriers or the stolons on the site had been planted on proper contours. Part of the area was mulched to reduce rainfall erosion, but most of the slope had a high percentage of bare soil, and was extremely vulnerable to erosion.

**Comment:** Pasture development in the Dry Zone monsoon environment should be undertaken with care, avoiding clearing areas much larger than can immediately be established with grass cover. In sloping uplands, consideration should be given to leaving contour strips of scrub jungle until pasture is well established, or, alternatively, using *Gliricidium* or similar species for contour hedges.

### ***Chena* Stabilization and Agro-forestry**

Shifting cultivation in the Dry Zone is associated with soils that are not appropriate for continuous low-input annual cropping, due to moisture and fertility constraints, labor shortage, and uncertain land ownership. Stabilization of annual cropping on a sites where shifting cultivation has been the norm will require increasing moisture retention and organic matter as well as chemical fertilizer inputs. This represents a considerable investment of resources by farmers accustomed to "mining" *chena* land. Any incentive structure likely to support such a commitment of financial and labor resources by Dry Zone farmers will probably need to include increased tenurial security as well as pay attention to keeping costs of new inputs as low as possible.

*Chena* stabilization activities have included a similar set of technologies as that applied to conservation farming on homesteads (for example, contour bunds, mulching, crop residue incorporation, plus multi-use tree planting on field borders and on bunds). There are two distinct objectives: on some sites the intensive planting of timber trees and other species (such as teak, mahogany, durian, and jack) is intended to convert the land to forest cover after the young trees begin to shade out the annual crops (two to four years). On other sites the land will be converted to long-term cultivation of annual crops during the rains (stabilized *chena*).

The intensive planting of timber and multi-use trees on *chena* lands under state ownership appears to be a classic example of the shared control strategy where farmers are given rights to the tree resource in exchange for maintaining forest cover. In some areas where trees are intensely planted on ground that is being used for annual crops, the question arises of where farmers will produce rainfed annual crops in the medium-term future.

The conservation farming technology being applied to stabilize *chena* appears to be a general set of practices devised for soil moisture and organic matter conservation. They do not appear to be designed specifically to respond to the constraints of a Dry Zone upland farming system — labor supply, soil nutrient dynamics, minimum economically viable farming unit size. SCOR needs basic socioeconomic research to determine the constraints to change in this farming system, and to substantiate the adequacy of their interventions with prior research or project experience in Dry Zone *chena* farming.

#### **Comments:**

- SCOR should perform a diagnostic analysis of the Huruluwewa Dry Zone *chena* farming system that identifies the land availability, soil type, nutrient supply, input costs, and labor supply constraints to change in this system.

- In particular, SCOR should verify the amount of land required by *chena* farmers for sustainable production of the grain and legume crops under a low-input "stabilized" system, given their probable need to produce green manures, use short fallow periods, and allow for land lost to bunding and tree shade.

SCOR and others who may replicate SCOR interventions need data on soil fertility dynamics, labor use efficiency, and the economic feasibility of *chena* stabilization. If these data are not available, research to gather and analyze these data must begin before *chena* stabilization is promoted with new farmer groups. Serious soil fertility management research is necessary to establish a package of inputs for continuous cropping of the rainfed uplands in Huruluwewa (see Morris, 1990). In the meantime, this activity must be considered an experiment whose results will not be available for several years.

#### **Comments:**

- In the short-term, emphasis should be given to intensive planting of small *chena* plots to timber and multi-use species, especially where rights to use of the trees can be secured through official documents.
- *Chena* stabilization for long-term annual cropping through conservation practices should be considered an experimental activity until fertilizer and other input levels required to maintain soil nutrients are established by research and field trials.

As remarked elsewhere, the SCOR project needs to evaluate its incentive structure for soil and water conservation to date. There appear to be several incentives for farmers to agree to participate in SCOR. Farmers are encouraged to believe that SCOR farming practices will increase farm productivity and profitability. However, conservation-related productivity increases for farmers are uncertain, or, at best, lie in the vague future. At the same time, SCOR is promoting the formation of groups for marketing, input supply, and small agro-based enterprises (for example, beekeeping in Nilwala) using the incentive of SCOR sub-grants to encourage farmer participation in SCOR conservation activities.

**Comment:** SCOR should focus on determining if certain conservation measures, especially low-cost vegetative measures, can increase the productivity of key crops such as maize and soya in the Dry Zone (and tea in the Wet Zone). If conservation-related productivity increases are significant, these practices should be promoted primarily, if not solely, on that basis.

#### **Homestead Cultivation with Agro-wells**

On their own initiative, many farmers in the Huruluwewa watershed are constructing shallow, large-diameter hand-dug wells to irrigate small plots of vegetables, fruits, and herbs. SCOR has tabulated information on over 700 of these wells, termed agro-wells, both upstream and downstream of the Huruluwewa reservoir. Most of them were constructed in the last 2-4 years, as farmers seek to secure an individual water supply, and intensify their production (Fernando, p. 5).

The construction of agro-wells for supplementary irrigation of homestead and paddy areas, especially during *yala*, is a high-priority activity for Huruluwewa farmers, judging by the proliferation of these wells. Two farmers visited in the Tract 6 area of Huruluwewa had used dug wells to make the

transition from rainfed tobacco farming on homesteads, a land use associated with soil depletion in Dry Zone Sri Lanka, to diversified vegetable, fruit, and herb production with intensive soil management.

The agro-wells show substantial potential for increasing productivity with sustainable, intensified land use in both upstream and downstream areas of Huruluwewa watershed. This activity should be considered a high priority for SCOR technical assistance, because wells observed in the field were very rustic, with no casing, reinforcement, or protection from uncontrolled runoff. Well diameters were extremely large — three to four meters — often an inefficient design.

**Comments:**

- SCOR should amplify its proposed monitoring of agro-well water use efficiency and ground water potential to include simple investigation of more efficient well design and construction techniques, and analyze the economic efficiency of pumping systems available to farmers.
- SCOR should look at the economic impact of agro-well construction, including its effects on land use and labor distribution. It may be found that intensification of homestead cultivation using agro-wells reduces the farmer's involvement in upland *chena* cultivation.

**Integrated Water Management at the Watershed Level**

The primary limitation to productivity increases in the Dry Zone of Sri Lanka is water supply. SCOR's "integrated water management in the watershed context" is an attempt to maximize productive use of water through two activities:

- Intensified measurement of water availability, and
- "Integration of people using water" by "establishing appropriate organizational linkages."

IIMI, and Sri Lanka in general, have abundant experience with farmer participation in irrigation water management, but this work has been confined to the command areas of large reservoirs. SCOR's innovation in this field to date has been the formation of WRMTs, which bring together government agencies with water users in the catchment (in this case, feeder canal) and command area of the Huruluwewa main tank. This year the local Irrigation Management Division staff and farmers participating in the WRMT meetings were able to arrive at some landmark agreements on water use within the watershed.

The WRMT concept has generated enthusiasm among some participants, particularly farmers, irrigation management division staff, and provincial level authorities. As a consultative group that includes farmers and government agencies, it provides opportunities for farmer groups to request and prioritize government services needed; coordinate water resource decisions in various parts of the watershed; and analyze land use issues that influence water availability, water quality, and land productivity. The fact that water use is the primary concern of the Huruluwewa WRMT to date is simply a reflection of the agro-ecological reality of the Dry Zone.

To date the WRMT is an extension of the SCOR project itself. The potential of the WRMT concept to improve natural resource management at the local level in Sri Lanka is dependent on its ability to generate wider policy support, incorporate strong participation of farmers from both major irrigation schemes and upland areas, and become independent of SCOR.

**Comment:** The SCOR team should continue to support the Huruluwewa WRMT in integrated water management at the watershed level, but the focus should be on finding ways to institutionalize the WRMT concept as a means to include both catchment area and command area farmers in Divisional-level natural resource management with the government agencies.

## **Nilwala Pilot Area**

### **Smallholder Tealand Conservation**

In his review of watershed policy options in Sri Lanka, William Fleming reports that "erosion is considered to be one of the reasons for the relatively low productivity of tea in Sri Lanka, with the 1988 yield amounting to only 52-64 percent of per-acre yields from Indonesia, India, Malawi, and Kenya. On tea plantations with good management (drains, mulches, and complementary cover crops), soil losses are as low as 0.3 t/ha/yr." He further reports that soil loss on up-country soils "has decreased soil organic matter by 37 percent, total nitrogen by 29 percent, available phosphorus by 36 percent and exchangeable bases by 20 percent" (Fleming, 1991).

As SCOR points out, well-managed tea can provide excellent ground cover resulting in minimal soil losses, approaching zero loss (Krishnarajah, 1988, cited in Fleming, 1991). Krishnarajah found in field trials that poorly managed tealand can experience soil losses of 50 to 100 tons/ha/yr as compared with well-managed tea that provides excellent cover and shows only 0.3 tons/ha/year soil loss, reduced to zero by mulching among otherwise well-managed plants. Compare this with the soil lost under fern or young pine (3.5 tons/ha/yr) or pine forest of eight years (0.5 tons/ha/yr).

The 46 percent of the Nilwala project area devoted to tea is divided among three classes of cultivators:

- Large tea plantations (> 50 acres) managed by private companies on 5-year leases from the government;
- Private holders with 10 to 50 acre tea plantations; and
- Smallholders with less than 10 acres of tealand.

Smallholders are eager to expand their tea cultivation, and because larger plantations cannot be divided or sold, the new smallholders' tea is being established on encroached state lands, especially steep forest lands.

The SCOR objectives in smallholder tea cultivation are to improve productivity, arrest forest loss, and reduce soil erosion. The assumptions are that improved productivity will reduce pressure to expand cultivation, and that reduction of soil erosion is integrally linked to tealand productivity.

The SCOR project is promoting a set of 10 conservation practices intended to conserve soil moisture and organic matter, and prevent erosion on smallholders tea plantations: stone terraces, drains, high and low shade trees, SALT live barriers, and various mulching technologies. Many of these conservation techniques are already known and practiced in the area.

Adoption of tealand conservation practices among smallholders has been sporadic in the first year. In the Bodeniya Tea Small Holders Society, approximately 20 percent of the members have adopted some of the recommended conservation measures, although the goal is for every member to protect 0.25 acres of tea in this phase of the program. Reasons for adoption or nonadoption of conservation are not clear. However, the Bodeniya Society is involved with SCOR in planning a whole series of other activities (for example, input supply store, bag manufacturing, tractor purchase) that may distract from conservation objectives.

The Small Holder Tea Authority gives subsidies in the form of loans to smallholders for new tea plantations. This subsidy includes mechanical conservation measures, but SCOR has had to struggle to get the Authority to accept some biological conservation practices (such as sloping agricultural land technology or SALT).

The impact of the conservation measures on tealand productivity and economics is not clear. Land used by mechanical and vegetative barriers and drains reduces the density of tea plants, requiring substantially increased production to compensate. The relative productivity and profitability impact of simple, inexpensive conservation measures such as mulching and expensive interventions such as mechanical barriers should be clarified, so that conservation recommendations can be optimized. Data on this topic will justify modifications to the subsidies.

The tealand that is being renovated and replanted is particularly vulnerable to severe erosion. The Team observed one site where unproductive tea had been removed, and the land was planted to grass (*Tripsacum* or *Cymbopogon*) to improve soil organic matter. Although rock terraces and SALT barriers were in place, the grass stolons were barely sprouting after 25 days, and the soil was over 80 percent bare. Rainfall impact had left soil pillars up to 2 cm in height, rills were 5-10 cm. deep, and transported material was spilling over barriers. This outdated emphasis on mechanical control over mulching, cover cropping, or other vegetative erosion control is apparently due to the Tea Authority's recommendations. The Team also observed new tea plantations with high percentages of bare soil that are extremely vulnerable to severe erosion.

Subsequent discussions with representatives of the Small Holders Tea Authority focused on SCOR's interventions (both technical and institutional) and how they could be incorporated into the Authority's standards for granting subsidies for regeneration of older, under-producing tealand. If SCOR can succeed in gaining official recognition for the value of mulching and possibly legume ground cover among the grass clumps prescribed by the Authority, the project will have made considerable headway against the most erosion producing stage of the tea planting cycle.

#### **Comments:**

- SCOR should determine the cost-effectiveness of various conservation practices in smallholder tea. Economic analysis of practices should take into account the short-term productivity impacts (soil temperature and moisture control, prevention of fertilizer wash-out), as well as estimate the long-term productivity impacts of soil erosion.

- SCOR needs to analyze and clarify the incentives being offered to smallholders who adopt conservation measures. It is unclear whether productivity impacts, access to related SCOR opportunities (for example, input supplies), or access to government subsidy programs will be the most effective incentives. But if no effort is made to diagnose the relative effectiveness of various incentives, it is unlikely the work can be replicated.
- SCOR needs to help introduce improved technology for tealand conservation during the critical soil rejuvenation, grass establishment, and tea seedling stages of the land use cycle. Current practice (and Authority guidelines) that permit prolonged exposure of bare soil with only mechanical barriers in place is outdated and destructive. Focus should be on establishing nearly 100 percent mulch or live cover on soil throughout the reestablishment cycle. Live cover species such as *Crotalaria*, *Stylosanthes*, or *Desmodium ovalifolium* should be investigated (Stocking, 1986).
- SCOR should use some of its short-term technical assistance funding to provide international soil conservation advice regarding the most appropriate strategies for Nilwala's very steeply sloping conditions.

#### **Stream and Road Reservation Conservation**

Stream reservation conservation measures observed were limited to the establishment of multiple-use perennials (such as jackfruit, bamboo, and mahogany) crops in narrow belts along watercourses. Farmers from the participating groups are given use rights to the species planted in the sectors of the reservations assigned to them. This system seems clear except in the case of the timber species like mahogany. When asked if the assigned user had rights to all the timber from these trees in the Bovitya sector of Horagala watershed, the farmers couldn't answer, because they were unsure whether reservation trees could be cut, although they were sure about their rights to fruit from multi-use trees.

#### **Agro-forestry and Plant Nurseries**

The SCOR project is working at several levels to arrest degradation of remnant forests in the area. As in Huruluwewa, user groups have been formed to plan future land use in watersheds. In the Dothalugala Heritage and Bovitya catchment areas, plans are well under way to enrich remnant degraded forests controlled by the Forest Department with a variety of introduced and native timber and multi-use trees.

There are two distinct types of shared control mechanisms being tried in the Dothalugala case. First, in the uppermost section of the watershed, the Dothalugala NGO, a local organization supported by SCOR, has planted trees using *Shramadana*, or traditional Sri Lankan communal labor. This area is to be a conservation reserve where the trees and land remain state property. The maintenance of the trees in this case will also be by regular *Shramadana*, with SCOR funds used to provide tools and refreshments. The stated objective of improving the hydrologic efficiency of the water catchment is unlikely in the near term. Nevertheless, the Evaluation Team believes that this is a good example of sustainable, community-based forest conservation because the community, once having invested the efforts of over 250 local residents in the enrichment planting, is likely to prevent further land clearing on upper slopes for tea.

The second type of agro-forestry, used on the middle slopes in Dothalugala, uses the shared control mechanism that grants users the rights to the multi-purpose trees planted in a series of tracts that have been assigned to the 28 participating families. These 28 families are responsible for nurturing the trees in their tract. In the Bovitya watershed, the users are eager to conclude a similar agreement for use of 10 hectares of degraded forest with the Forest Department. An additional reason for their enthusiasm is that this will give them official permission to enter the forest to extract medicinal plants.

Several plant nurseries were started early in the SCOR project in Nilwala, using Rs3,000 grants to small groups of farmers who now manage these nurseries as a group and sell the planting stock for 3 to 5 Rupees per tree.

Group nurseries of this type are common early activities in rural development projects, but rarely are they so well run. Nonetheless, the sustainable option for plant production often turns out to be private, not communal, nurseries.

**Comment:** The SCOR project should publish a detailed report after two years of field work on agro-forestry techniques for Sri Lanka, emphasizing the technical, organizational, economic, and legal aspects of user group agro-forestry interventions on state land, including cost-effectiveness of various schemes.

## **TRAINING AND EXTENSION**

SCOR training activities are directed toward the following groups: SCOR TA teams including catalysts; farmers, user groups, and user organizations; and government officials of relevant line agencies at different levels.

### **SCOR Teams**

Some formal training has been provided to SCOR team members and catalysts via workshops and meetings, particularly in the early stages of the project. The objectives of the training were to familiarize the SCOR staff and catalysts with SCOR concepts and strategies, to develop a participatory planning approach to initiate SCOR activities, and to impart required skills such as financial management and research.

### **Farmers, User Groups, and User Organizations**

In training farmers SCOR has placed little emphasis on formal training events, and has given more attention to informal training such as field days, demonstrations, and awareness creation. These activities have been successful in motivating farmers, introducing them to SCOR concepts, and giving them some experience in implementing conservation practices.

Although SCOR frequently refers to having trained farmers, the Team found no evidence that the farmers are involved in regular, structured training exercises with clear, practical skills acquisition objectives. It is apparent that farmers in the SCOR pilot areas are not receiving this type of training, and are not yet confident in their abilities to implement and evaluate conservation practices, form and manage

user groups, and teach these skills to other farmers. Developing participatory training modules to help farmers acquire these skills should be a priority for SCOR in the coming years.

**Comments:**

- Serious attention should be given to developing a standard training package for volunteer catalysts and expert farmers.
- A network of "expert" or "key" farmers is one effective and inexpensive way of increasing the outreach capacity of the agriculture extension program. But, to continue to be effective these farmers need frequent skills and leadership training.

**Government Officials**

Instead of a focusing on formal courses for farmers and officials, SCOR has provided opportunities for training through interaction between SCOR and line agency personnel at periodic meetings, such as the WRMT, and by field visits to SCOR sites. As in the case of farmers, this is more motivation than training. If SCOR is to be sustainable, government officials need a substantial amount of structured training on participatory land use planning, conservation farming, agro-forestry, integrated resource planning, and farmer training techniques.

**Training Materials**

No training modules or materials have been prepared for training SCOR staff and government officials. The excellent experience gained to date in implementing SCOR activities has not been used to generate training material. Training material for farmers has been limited to a few short pamphlets on different aspects of land and water conservation.

**Comment:** SCOR should develop a strong training component for the Phase II, developing structured training modules and materials. These should contain all the training materials necessary for training officials and farmers up to a high level of proficiency. Eventually, the government personnel and "expert" farmers so trained should be able to form effective user groups and implement successful conservation programs with SCOR staff acting only as consultants.

**SELECTING REPLICABLE ALTERNATIVES**

As a pilot project, SCOR technicians are implementing many practices on an experimental level. SCOR's challenge in Phase II is to decide which interventions are most cost-effective and most feasible for local government and line agencies or other very modestly funded NGOs to implement with farmer groups. SCOR interventions are not inherently costly. SCOR needs to document the costs of implementing alternative mixes of simple, effective conservation practices using the existing line agency personnel, and expert farmers or volunteer catalysts as the contact people with the user groups. Before the end of Phase II SCOR should be able to identify and document a minimal cost strategy of effective, easily replicable soil and water conservation interventions that can be linked to tested tenurial

arrangements for land and resource use. During the latter part of Phase II, SCOR should concentrate on assisting existing institutions to adopt this strategy and to support ongoing user group activities.

Before the end of Phase II it should also be possible for senior SCOR technicians to classify general types of land and land use problems in NC Province and Southern Province (e.g., Minor Tank Paddy soils, Ultisol uplands with slopes 3-8 percent, Alfisol uplands with slopes of 8-20 percent) and to recommend general conservation practices for those lands to guide others.

**Comment:** A series of manuals and training modules based on actual experience with farmer adoption of conservation technology in the pilot areas should be produced to guide existing institutions in selection of "best practices" and to help them guide farmers in adopting them.

## CHAPTER SIX

### SECURING SHARED CONTROL OF RESOURCES

#### BACKGROUND

It is widely accepted that security of tenure is essential to persuade users to adopt more sustainable natural resource management practices. But a substantial number of users within the project area do not own the land they operate, nor do they have any long-term usufructuary rights to this land. Hence, significant changes in land laws and regulations are needed before SCOR interventions can be fully successful.

The legal tenure system in irrigated settlement projects is based upon a 99-year lease prescribed by the Land Development Ordinance of 1935. The lease incorporates certain restrictions as well as potential for flexibility. Restrictions were placed on sales, mortgages, leases, and subdivisions in the inheritance process. The government has very recently declared a policy of removing these restrictions and the implementation of that policy is expected in due course.

SCOR's attention is largely focused on land tenure arrangements in respect to the so-called encroachers. In the Wet Zone, including the Nilwala pilot area, most of the encroached land has been cultivated to expand tea cultivation and little additional land exists for this activity except on the steepest, most fragile slopes. In the Dry Zone, including the Huruluwewa pilot area, various estimates report as many as 2 million hectares of rainfed lands that might be farmed; as much as 485,000 hectares of this area is estimated to be cultivated already by encroachers (Evnin et al., p. 43). In spite of a spate of laws to impede the pace of encroachment, the state has not pursued legal action against land encroachers. This is because of its awareness of its own inability to provide additional employment and incomes to the expanding population in the rural sector. On the other hand, recent efforts of the government have been to "regularize" such encroachments as far as possible, and to encourage input and other support to these regularized settlers. Most of these regularized encroachments raise food and cash crops.

Most encroached land in the Dry Zone is *chena* land (more than 60 percent) and homestead (25 percent), with paddy land being less than 15 percent (Wanigaratne, p. 12). The number of households depending on *chena* lands for their primary support is undoubtedly increasing. Nevertheless, even with past land alienation laws, most encroached lands have not been regularized and most encroaching farmers lack the incentives provided by land titles or long leases to invest in their land even to the extent of using as much fertilizer on them as on "owned" lands, much less investments in soil conservation practices as proposed by SCOR.

#### SCOR's Shared Control Strategy

SCOR's shared control strategy is the end product of an important debate in the project design process. It is a compromise between a desire to secure farmers' "rights to resources" through land title policy reform, possibly leading to free-hold distribution of *chena* lands; and government concern to assure that land is used wisely and that free exchange of title does not consolidate land in a few hands creating a class of landless labor. Shared control combines renewable leases with formal agreements to implement conservation farming practices and not to plant certain crops known to increase soil loss.

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SCOR's approach to the problem of land tenure is to ensure more security for the landholder and at the same time to make him contribute effectively to the conservation of land and water resources in the watershed within which he operates. Towards this end, SCOR has taken a series of significant creative steps that appear to be quite practical and acceptable both to the settler and to the state and provincial government officials:

- The SCOR-IIIMI team has gained approval for awarding land use leases to farmers in protected areas who agree to adopt conservation practices;
- SCOR-IIIMI has proposed that more security should be afforded to lessees by extending the period of leases to at least 30 years, so that farmers can meet environmental considerations and at the same time make the land more productive; and
- SCOR has adopted a creative system of "tree tenure" to provide the right to use the produce over time or extract timber at maturity, as the case may be, even when land as such is not leased.

#### **Types of State Lands Used by Encroachers**

The state lands used by communities in the project areas can be divided into 3 categories:

- Land in the major irrigation project, with tenurial arrangements as per Land Development Ordinance;
- Undeveloped state lands; and
- Developed state lands or those earmarked for development such as canal and bund reservations, land reserved for public purposes, as well as wildlife sanctuaries, and forest reserves.

This land falls into two broad categories: unirrigable land and irrigable land, with the primary concern of SCOR being the uses of unirrigable land in the highlands.

A greater part of the unirrigable land belongs to the state. Although these lands were administered by several line agencies, the bulk came under the jurisdiction of the Land Commissioner and the Conservator of Forests.

With the establishment of the Provincial Councils, the administration of the lands coming under the Land Commissioner was devolved to the Divisional Secretaries. The devolution however, did not change the patterns of land alienation, and the earlier practice of leasing lands to persons for periods ranging from 1 to 5 years has continued. The leased land is used mostly for short-term food crops but because of the insecurity of tenure the lessee is not motivated to strike a balance between production and protection. Even if he is interested in the conservation of the resource he is not compensated for any improvements he may have affected on the land.

#### **Status of Encroachers on State Land**

Besides the people who obtain land on permits for production purposes there are also other users who have encroached on state land administered by the different line agencies. Some of these

encroachers come from the second and third generation of persons who received land within the irrigation command area of earlier settlement schemes, some are residents of old traditional villages, and some are migrants from other areas who have moved in because of the availability of land and in some cases also water. The majority of these persons are landless and subsist by growing temporary crops on the encroached land.

In addition to the landless encroachers there are also landowners in the traditional villages who have encroached on state lands. These are the *chena* cultivators who supplement their income from paddy and homesteads by growing temporary crops on cleared holdings. In the past, such *chena* cultivators rotated the land they operated but in recent times there has been a tendency to demarcate one or two holdings and remain there while cultivating temporary crops.

Since many encroachers in different parts of the country (including Nilwala) have been living on their encroachments for a considerable period of time but with no rights whatsoever to the lands they cultivate, the government took steps to regularize encroachments prior to October 1989. Under this program the encroacher was given an annual permit and this was followed by a grant that gave him the ownership of the land subject to certain restrictions.

Because the cutoff point is October 1989, all those who have encroached on land after that date are liable to be evicted. Although this possibility exists, little or no action has been taken up to date to evict encroachers. Hence they continue to remain on the land despite the fact that they do not have any rights to it.

It has been accepted recently in Sri Lanka that a sense of security and a right to income streams generated from the land that is operated is essential to users' adoption of more sustainable management practices. SCOR is an innovative project in that it is taking concrete steps to promote agreements between the state and the users (both lessees and encroachers) for improving the productivity and conservation of land and water resources.

## **SCOR POLICY DIALOGUE WITH GOVERNMENT**

SCOR has succeeded in engendering a national policy dialogue with the relevant ministries and departments and has initiated actions to bring about appropriate changes in current land laws and regulations. SCOR interventions in this regard fall into two broad categories.

### **Lands under the Jurisdiction of the Conservator of Forests**

The present rules permit land to be given on a long-term lease up to 30 years. SCOR has made use of this provision and has facilitated arrangements for individual users to enter into agreements with the Forest Department for long-term use of state forest lands for purposes of production and protection under a system of "tree tenure" guaranteeing the right to use the produce over a period of time or extract timber at maturity.

### **State Lands under the Jurisdiction of the Divisional Secretaries**

The SCOR intervention has been to propose to the government a set of changes in the existing land laws and regulations. The project has recommended to the government, through the National Steering Committee, that when land is leased out, long-term lease arrangements of at least 30 years between the state agencies and the user be executed. This is to encourage the user to grow special species of plants and trees while allowing him to make use of the remaining land for the cultivation of appropriate short-term crops. In addition to long-term lease arrangements, SCOR has also recommended that:

- When giving state land to individuals or when regularizing encroachments, an appropriate land use restrictions for a parcel of land be specified in the lease agreement;
- Similar specifications be made when extending current lease agreements;
- The state should have the right to inspect the leased land periodically, to ascertain whether the lessee is following the terms and conditions of the agreement;
- The lease agreement should allow the authorities to recover the possession of the land, in the event of a breach of the terms and conditions of the agreement; and
- The membership in an active and recognized resource user group/organization be considered a necessary qualification, when issuing lease permits to individuals and organizations.

### **COMMITMENT TO POLICY CHANGE**

The Evaluation Team has encountered a spectrum of thought about the relative importance of the government-farmer agreements for shared control of natural resources on encroached lands. One end of the spectrum of opinion interprets shared control of resources broadly, minimizes the importance of GSL-farmer agreements, and believes SCOR should be experimenting with any interventions that conserve natural resources and increase farmer income as long as user groups are sharing the inputs and responsibilities. At the other end of the spectrum, renewable land lease agreements and "tree-tenure" agreements for encroachers and encroached reservation land are considered a touchstone of SCOR success.

The interpretation of shared control to reflect communal management of irrigation water, cooperative marketing, or other types of community-based management is not a particularly innovative idea in Sri Lanka — especially in the Dry Zone where most of the land area needing attention lies — and does not reflect the intent of the USAID project amendment that funded the SCOR project. On the other hand, the Watershed Resource Management Team concept pioneered by SCOR, where a committee of farmers, government line agency personnel, NGOs, and divisional planners meet to discuss issues and plan natural resource management initiatives in their area, is a significant move toward sharing control in the decision-making process. But the core of shared control relates to the control of state lands and their soils and forests. SCOR has an opportunity already well begun by its land and tree leasing initiatives to explore ways of securing farmers' control of the land they cultivate and to bring the very large tracts of degraded public lands in the Dry Zone under systematic management.

### **Results Expected from Shared Control of Land Resources**

Almost all agree in principle that if encroachers can be given formal rights to use reservation land on a longer time line, farmer investments in soil management will make it possible to stabilize *chena* cultivation and reduce shifting cultivation. In addition, "tree tenure" arrangements can be made with the Department of Forestry where more land abutting and surrounding areas leased for upland homesteads and annual cropping can be planted to such valuable perennials as teak, mahogany, jack, cashew, rambutan, and durian.

Through local service organizations, community groups, and local NGOs, regularized encroachers working leased reservation land can be enlisted in the efforts to restore and protect tree cover to deforested, scrub jungle lands in the upper watershed above their leased holdings and in the buffer zone of "tree tenure" agreements. With legal title to trees and tree products planted on reservation lands, farmers will protect those resources, thereby creating the desired forest cover, sparing the government costs of protecting forest lands and protecting downstream tanks, channels and paddy fields from siltation from eroding highlands. With good agro-forestry and conservation farming guidance, farmers can get a good short-term income stream from approved annual crops and cropping patterns, add income from perennial fruit products in the midterm, and accumulate wealth in the form of timber products maturing in approximately 20 to 30 years.

**Comment:** SCOR needs to document costs of production and increases in farm income associated with these interventions.

### **Sustainability of the Shared Control Strategy**

The shared control strategy has already begun to work in the SCOR project areas in Huruluwewa and Nilwala. One of the key advantages of this strategy for land protection is that the cost is relatively low, especially compared with the introduction of livestock, new crops on paddy land, and various types of new marketing ventures to be supported by sub-grants and specialized technical assistance. Staff of some line agencies, especially agencies with reservation lands, feel they can replicate the combination of conservation farming, agro-forestry, and upper watershed enrichment planting modeled by SCOR with minimum outside funding in the future, by using a shared control approach.

Recommendations made by SCOR in regard to the leasing of state land coming under the jurisdiction of the Divisional Secretaries are clearly necessary to motivate users to strike a balance between production and protection. It is likely that those users who have agreed to accept the SCOR recommendations have assumed that changes in the current land laws and regulations will be made fairly soon. Hence if the tenure situation remains unchanged for long, it could lead to frustration and loss of credibility.

### **Progress in Policy Change**

Evidence to date indicates that GSL officials are committed to making the necessary policy changes. This commitment is seen in:

- Willingness of officials to have a constant dialogue with the SCOR project officials and their appreciation of the institutional arrangements made in the form of WRMT and the NSC to address problems;
- Handing over of user rights in identified reservations currently under the jurisdiction of line agencies on long lease terms in the two watersheds to users (The Conservator of Forests has agreed to administer these reservations in line with their own programs in the two watersheds); and
- Efforts being made by the SCOR National Coordinator to set up a group comprising representatives from concerned departments to work out detailed guidelines, to operationalize the arrangements, and to resolve issues relating to other land reservations coming under Divisional Secretaries, the Irrigation Department, and the Mahaweli Authority.

### **Land Holding Size and New Communities**

Observers have noted that land allocations in these areas in Huruluwewa and Nilwala may have provided too small a land base for this strategy of land protection to work, especially if the leased lands cannot support more than one generation of settlers through agricultural production, resulting in declining quality of human life and an increase in illegal land uses.

Insufficient landholdings in homestead areas is one of the pressures resulting in *chena* cultivation. SCOR staff has an opportunity to consider appropriate holding sizes through their ongoing experiments with stabilized *chena* and agro-forestry schemes. It is critical to determine what land tenure and tree-tenure rights on what size of holding are an appropriate combination, so that planners at the national, provincial, and divisional levels can use this information to guide their particular policies.

Replication of the SCOR model for improving land protection and production through new rights and technologies will depend in the future on the interest, capabilities, and policies of local government, and the pressures put on them by farmer groups. SCOR needs to show that homestead development and agro-forestry, conservation farming, and upper watershed tree enrichment are technologies that can be supported by local government with minimum outside funding in the future if the correct planning organizations and policies are in place. The grassroots user group organization and land use planning strategies may even be appropriate for other community infrastructure including schools and health clinics, roads, and electrification that will follow in time.

**Comment:** SCOR should document the necessary land size in typical Dry Zone settings to support a typical farm family adopting SCOR-recommended mixed conservation farming and drawing some part (considerably less than half) of its income from off-farm employment.

## **A MANAGEMENT STRUCTURE AFTER SCOR**

### **Current Structure**

The strategy of setting up special Steering Committees at Project, District, and National levels has been a good arrangement to facilitate implementation of project activities. The Steering Committee mechanism is presently effective for problem-solving, strategy formation, and policy formulation. However, the functioning of these committees is likely to cease following withdrawal of SCOR. Although the existing Steering Committees are there to assist SCOR and its activities, it is necessary to examine the existing arrangements for coordination at the various levels, in the normal governmental structure.

A major institutional constraint has always been the lack of effective coordination between the large number of government departments and agencies involved in utilizing land and water. For example the task of enforcing the Soil Conservation Act is the responsibility of the Agriculture Department, but the mandate of that department has been restricted to rice and other food crops. The major factors contributing to erosion in the upper catchment are the Plantation Corporations and the private sector plantation industry, over whose activities the Department of Agriculture has no supervisory control. Thus, a major constraint for enforcing soil conservation measures is the lack of coordination in enforcement.

### **Seeking a Sustainable Structure**

The process of creating a new institutional mechanism for effective coordination of land and water resources should be a bottom-up approach. Once a successful arrangement is instituted at the lower levels, the evolution of an appropriate arrangement at the subnational and national levels will be greatly facilitated. It can be one of SCOR's functions therefore to suggest and promote the formation of a stable coordinating mechanism for land and water resources at least from the village level up to the District level. In such a scheme of coordinating committees, SCOR's staff should not be members or take any active part. They may however function as observers and facilitators in the initial phase of such an exercise.

Devolution of governmental and administrative authority to Provincial Councils under the 13<sup>th</sup> Amendment to the Constitution constitutes a fundamental change in the policy environment in respect to land and water resources. Among the subject matters assigned to Provincial councils are:

- Water storage and management, drainage, flood protection, and the planning of water resources.
- Rights in or over land, land tenure, land transfer and alienation, land use, land settlement, and land improvement, subject to certain conditions related to stage land and inter-Provincial irrigation and land development projects.

Devolution transfers both legislative and executive powers in terms of subjects assigned to a Provincial Council. Thus, a Provincial Council has powers to pass statutes for subjects assigned, making existing laws for those subjects inoperative within the Province. One drawback in the devolution package appears to be that Agrarian Services has been declared a nondevolved subject. The Agrarian Services Committee and the newly created farmer organizations charged with "coordinating agricultural activities

and implementing agricultural policies of the government" are outside the purview of Provincial Councils. However, the Provincial Council is assigned the subjects of agriculture, extension, promotion and education for provincial purposes and agricultural services.

Given the role of Provincial Councils as stated above, SCOR has quite appropriately established strong linkage with the two councils of the NCP and the SP where the project is operative. The Provincial Steering Committees chaired by the respective Chief Secretaries appear to be playing a key role in translating SCOR's activities from project mode to program mode. The encouragement and support given to SCOR by the Chief Secretaries and the senior staff at the Provincial level is proving to be very effective at promoting a spread effect in the Province through the medium of the local heads of government and provincial council agencies participating in the PSC.

### **National Leadership**

In regard to the National Steering Committee, it appears to be functioning effectively with the Secretaries and Heads of Departments involved playing a useful role in monitoring the activities of SCOR on a regular basis. However, as the policy changes envisaged under SCOR go well beyond the purview of the Ministry of Irrigation, Power and Energy, it would appear timely during Phase II of SCOR to consider whether this Ministry or some other is more appropriately charged with leading the NSC. SCOR has recognized the objectives of the National Environmental Action Plan in relation to soil conservation, reforestation, watershed protection, increased security of tenure, and the involvement of local communities in resource management. However, SCOR does not appear to have any formal links with the Central Environment Authority.

**Comment:** SCOR needs to explore the best institutional arrangements for future management of this project and others like it. Management options in addition to the current arrangement might include such institutional hosts as the following:

- The LUPPD of the Ministry of Agriculture, Forestry and Land (where an interest in soil and water conservation might be rekindled);
- The Ministry of Planning, which is central to all the Ministries and Agencies dealing with land and water and should be considered if this appears practicable; or alternatively; and
- Including representatives of the Ministry of Planning and The Central Environment Authority in the NSC or wherever the project is formally housed.

## **CHAPTER SEVEN**

### **FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS**

#### **SCOR-IIMI STRATEGY**

It has been a year of intense activity for SCOR, a year in which many interventions have been enthusiastically initiated. The participatory approach used in designing SCOR has been extended to user group formation and integrated natural resource planning. Coupling this approach with carefully selected technical interventions and the stimulus of small sub-grants to user groups has resulted in a quick start-up and favorable responses from farmer participants and government decision makers alike.

SCOR's strategy for linking community-based organizations with existing but underutilized programs such as the Participatory Forestry Program has produced quick results in the field and stimulated constructive discussions at all levels of government about means for increasing farmers' tenure rights. The Chief Secretaries of the NCP and SP as well as their Provincial Councils are actively engaged in discussions of SCOR interventions on conservation farming and SCOR's creative ideas for increasing farmers' land and resource use rights.

Land use plans drawn up by village groups of farmers assisted by SCOR catalysts are being used to seek formal resource use permits, agreements, and leases of state land from local government. Small sub-grants have helped farmers meet part of the initial costs of changing land use patterns; much more has been contributed in kind by the farmers themselves if their additional labor is properly valued. Small sub-grants have also supported group enterprise initiatives and cooperative marketing agreements, some of which appear to offer real promise of increasing farm incomes.

The SCOR-IIMI technical assistance teams in Colombo, Huruluwewa, and Nilwala have worked hard and to good effect. Their cadre of catalysts is really quite impressive as are the volunteer catalysts who have come forward from local communities to assist the SCOR teams.

#### **SCOR'S FUTURE — PHASE II**

We believe that SCOR represents an excellent opportunity for Sri Lanka to accomplish several important purposes in an integrated fashion. SCOR responds to a real need among Sri Lankan peasant farmers for legal access to additional arable land, land which is almost all publicly owned and seriously degraded from previous unmanaged use. SCOR brings people and resources together in a public, transparent way to explore means of controlling illegal and destructive encroachment on public lands while empowering poor farm families who are increasingly dependent upon these very same lands for their livelihood.

SCOR focuses government attention on the complementarity of a farmer's need for formal user rights to the resources he farms and the state's need to assure the right use of these resources — the conservation of Sri Lanka's agricultural resource base. Although estimates vary, there may be 2 million cultivatable hectares of rainfed lands in the Dry Zone (mostly owned by the government), a quarter of which may already be occupied by encroachers. Effective programs to protect the natural resource base

on this land, as well as the high biological diversity of the Wet Zone forest reserves, are desperately needed. SCOR combines concern for protection and the need for production, generating models for others to consider as Sri Lanka grapples with issues of land and water management, social equity, and income generation for a population still largely rural and agrarian.

**Recommendation:** The Team recommends that, with some modifications suggested below, the Shared Control of Resources Sub-Project of NAREPP be extended into Phase II for four years and that the Cooperative Agreement with the International Irrigation Management Institute be renewed.

### **THE SCOR-IIMI TEAM**

There have been no project management or technical assistance problems of note, though there are currently three vacancies on the IIMI teams which the Evaluation Team believes should be filled as soon as a formal decision regarding Phase II of SCOR is made. There is also a need for additional professional input on a full-time basis in soil conservation in the Nilwala pilot area.

#### **Recommendations:**

- Recruit appropriate senior professional personnel as soon as possible to fill the current Team Leader vacancies in Huruluwewa and Nilwala.
- Fill the vacant socioeconomic specialist position on the Colombo team as soon as possible.
- Add a long-term, full-time soil conservation specialist to the Nilwala team.
- Provide expert short-term international advice for conservation efforts on the steeply sloping lands of Nilwala watershed.
- Continue to access specialized assistance on tenure and conservation.

### **PROJECT FINANCING**

The Evaluation Team finds that the financing originally budgeted for SCOR is adequate for the purposes intended. The recommendations offered below should have little or no impact on the total cost of SCOR with the possible exception of holding a major national workshop later in the project.

### **PROJECT REPORTING AND THE SCOR MANAGEMENT INFORMATION SYSTEM**

Project reporting has been timely and exhaustive, delivering detailed records of numerical progress toward targets in each theme area and pilot watershed. Its utility can be improved by amplifying the

discussion of the natural resource management and land tenure issues being raised by SCOR interventions and presentation of alternative solutions SCOR is exploring.

The SCOR-IIMI databases and information system are elaborate, and capable of generating large quantities of pertinent data. The Evaluation Team feels that the number of indicators being used is, in some respects, excessive and that some new indicators, especially related to tenure, productivity, and socioeconomic factors, could be incorporated to good effect.

**Recommendations:**

- SCOR reports should include more ample discussion of the project's experiences with natural resource management and land tenure policy innovations during field implementation to document progress and possible spread effects.
- SCOR-IIMI Project Reports to USAID should provide focused discussion of issues requiring attention and suggest alternative solutions.
- SCOR-IIMI and USAID should review the project information system to arrive at a smaller set of appropriate implementation benchmarks and indicators of project impact, paying particular attention to tenure, land productivity, and socioeconomic factors.

## **SOIL AND WATER CONSERVATION INTERVENTIONS**

### **Incentive Structure**

Soil and water conservation techniques introduced in SCOR's first year have met with mixed results. This is to be expected. SCOR's soil conservation and water management interventions are appropriately simple and for the most part involve little risk. Some are labor intensive (for example, earth bunds and vetiver and *Gliricidium* hedgerow planting, as well as mulching) while others such as agro-forestry tree-planting are low-input. In all cases, it is important for SCOR to clarify the incentives operating to encourage farmers to participate in user groups and to adopt SCOR interventions.

SCOR has made significant progress in securing farmers' tenure rights to land and forest resources with a number of creative leasing and contracting mechanisms. Longer leases for agricultural land and tree-tenure contracts for trees planted in buffer zones have been linked to community participation in enrichment planting of upper watersheds requiring community protection.

**Recommendations:**

- SCOR should carefully analyze the effects of different types of incentives (improved productivity, sub-grants, tenure rights) on adoption of different soil conservation and agro-forestry practices in an effort to provide useful, low-cost models for Sri Lanka.
- SCOR should continue to press for alternative ways to increase security of land and forest tenure rights as a direct and effective means of establishing needed incentive for farmer investments in soil and water conservation.

## Technical Considerations

Dry Zone soils in Huruluwewa suffer seasonal water shortage, low organic matter, and nutrient deficiencies — all resulting in low soil fertility. The *chena*, or shifting cultivation, typically practiced on these lands causes further fertility degradation and requires the farmer to continually seek new lands for exploitation, thereby degrading the biodiversity, forest production, and watershed values of the forest reserves and other government lands.

The conservation farming technology being applied to stabilize *chena* appears to be a general set of practices devised for soil moisture and organic matter conservation. They are not yet designed specifically to respond to the constraints of a Dry Zone upland farming system (for example, soil nutrient dynamics, labor supply, alternative earning opportunities, minimum economically viable farming unit size). SCOR may need additional information to determine the constraints to change in this farming system and to substantiate the feasibility of maintaining adequate crop yields with their interventions.

In Nilwala, slopes range from 20 to 60 percent and are used primarily for perennial crops, mostly tea. Expansion of tea cultivation is the first priority for new ground cleared by encroachers in the upper watershed. Better tea management is an achievable objective with smallholders. They continue to invest family labor in tea even though large state tea plantations are responding to Sri Lanka's relatively high labor cost (compared with India where costs are reportedly one-half those of Sri Lanka) by planting firewood and hardwood species on old tea ground rather than replant tea.

SCOR must amplify its proposed improvements on the mandated land rejuvenation practices of the Small Holders Tea Authority, incorporating appropriate vegetative conservation techniques in seedling and pruned tea to reduce erosion, fertilizer wash-out, and soil moisture stress, thereby improving the productivity of tea.

The Team has offered a series of specific technical comments on SCOR conservation interventions in Chapter Five and has recommended above that a soil conservation specialist be added to the Nilwala field team to supervise efforts to improve soil management, especially in the smallholder tea sector. These comments are summarized here in several general recommendations.

### Recommendations:

- Conservation technologies introduced by the project should be subjected to rigorous benefit-cost analysis.
- Focus should be on low-cost technologies that improve productivity through moisture and nutrient retention, not mechanical erosion defenses. Particular attention should be directed to the sustainability of the land use model, nutrient dynamics, and socioeconomics of *chena* stabilization.
- The technical improvement of agro-wells for homestead gardens and continued support to water use planning at a watershed level need to be prioritized in the Huruluwewa area as conservation practices that have major economic impact, and that may be the key to sustainability of Dry Zone farming.

## **SUB-GRANTS**

The role of sub-grants, loan leveraging, and organization of new marketing channels by SCOR staff in stimulating the formation of user groups and the effect of these financial tools on group sustainability have been debated by the Evaluation Team. In general, the Team feels that SCOR should not allow preoccupation with development of alternative financing and marketing mechanisms for user groups to distract the staff from the central project thrust of improving productivity through land and water conservation and land tenure innovations.

The Evaluation Team recognizes that USAID/Sri Lanka is involved in several other projects or proposed projects in small-scale rural enterprise, commercial agriculture, and rural finance, and suggests that these projects may offer efficient means of meeting SCOR's needs for market development and support of new rural enterprises without duplication of effort.

### **Recommendations:**

- SCOR assistance to user groups in marketing and finance should not attempt to replace existing market and banking institutions and mechanisms, whether those be formal or informal; SCOR should also avoid accepting de facto project responsibility for the formation and sustainability of farmer cooperatives.
- SCOR-IIMI and USAID should consider ways in which SCOR might benefit from other USAID-assisted efforts in agricultural marketing and business development in Sri Lanka such as Agro-Enterprise or Mahaweli Enterprise Development.

## **RESEARCH AGENDA**

The Evaluation Team found the SCOR research agenda to be appropriate and important to the project's effort to document alternative natural resource management and tenure policy models.

**Recommendation:** SCOR research should remain focused on documenting the resource management models and their impacts, with added emphasis on issues related to the relationships between land tenure, adoption of conservation practices, productivity, and income.

## **SUSTAINABILITY OF USER GROUPS AND SCOR INTERVENTIONS**

SCOR-IIMI's own experience with forming mature user groups has shown that this is a time-consuming process. Most of the groups formed by SCOR catalysts since October 1993 are still in the process of reaching a sustainable level of maturity by SCOR-IIMI standards. The majority of groups have formed around their interest in receiving benefits from the SCOR project, and they lean heavily on SCOR catalysts and other staff for guidance. This dependency is not surprising at this early stage of the project. However, in the immediate future, it will be important to determine whether these groups can transcend their status as SCOR groups and become sustainable local institutions able to interact with

government agencies and the private sector without SCOR's assistance. This is among the most significant challenges faced by SCOR and IIMI in Phase II.

Another important challenge for SCOR in Phase II is to keep attention focused on increasing farmers' tenure rights. The Evaluation Team is concerned that controversy surrounding alienation of public lands in Sri Lanka may unduly slow SCOR's otherwise considerable progress in finding creative ways to increase farmers' tenure rights. Planning a National Workshop on Conservation, Productivity, and Land Tenure Reform sponsored by SCOR later in the project would help heighten attention throughout the remainder of SCOR to the interdependence of these objectives.

In Phase II, SCOR-IIMI needs to focus on establishing quality examples of conservation farming and agro-forestry as models for future expansion. Experience in Phase I indicates that original output targets for forming mature resource user groups and for implementing conservation practices may be unrealistically high. SCOR-IIMI should continue a strong field effort in the original pilot communities and among their immediate neighbors, spreading the SCOR technology and organizational innovations within the pilot watersheds. If further expansion is undertaken, SCOR should be careful that its resources are not spread too thinly to accomplish the primary objects of learning which interventions work best and can be replicated by others at the least possible cost.

International experience indicates that for newly introduced soil and water conservation practices to become sustainable, several years of continued extension support to these new undertakings is needed to help farmers understand and own those practices most suited to their situations. SCOR needs to accommodate these constraints and select an appropriate time frame in which its interventions will be established.

#### **Recommendations:**

- SCOR should sponsor a National Workshop on Conservation, Productivity, and Land Tenure Reform.
- A minimum of three to four years of technical assistance is recommended in the pilot sites to consolidate the process of adaptation and adoption of upland conservation farming initiatives.
- SCOR's targets for geographic expansion should be moderated.

### **REPLICABILITY OF SCOR INTERVENTIONS**

The SCOR innovations in natural resource management and land policy need to be analyzed from a perspective of economic sustainability and replicability in Sri Lanka. Early in the introduction of new practices, in the first two to three years of SCOR intervention and follow-up, costs per farm will reflect the experimental nature of the activity, but, as direct SCOR support is withdrawn, the costs per farm of replicating the program need to be ascertained. In the minutes of the fifth SCOR NSC Meeting, the Chairman is reported to have observed "that it might be too premature to evaluate the full impact of SCOR for purposes of replication . . . on a wide scale as a significant experimentation was going on, and it might be useful to monitor these (sic) over a few more seasons before institutionalising (sic) arrangements to expand" (SCOR, Section III).

SCOR must focus on identifying institutions and mechanisms to continue SCOR interventions in its absence. As pilot site communities consolidate their new land use patterns, and additional neighboring communities enter the project, SCOR should assist local government agencies and service organizations to experiment with simplified, low-cost systems for accomplishing group formation, land use planning, conservation, production, and land tenure objectives. In assisting others to implement these models, probably in the last two years of the project, SCOR should act principally as advisors, gradually phasing out its project field staff, while concentrating on training other agencies to take over SCOR management innovations.

**Recommendations:**

- Late in Phase II, SCOR should assist local government agencies and NGOs to replicate a minimum-cost package of land use planning, conservation practices, and land tenure.
- SCOR needs to ensure that its intervention sites are recognized as representative of other similar sites where a comparable set of interventions can be easily and productively adopted.
- SCOR needs to develop strong training modules for farmers, catalysts, extension agents, and government planners.

**ANNEX A**

**SCOR MID-TERM EVALUATION TERMS OF REFERENCE**

## **TERMS OF REFERENCE**

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

#### **MID-TERM EVALUATION**

##### **I. Background**

The Shared Control of Resources (SCOR) sub-project under NAREP is a six-year \$7 million activity which will assist Sri Lanka to sustain the productivity of its land and water resources within selected watersheds through shared control of those resources with local user-groups. The project design began based on concern for lack of clearly defined tenurial rights of small farmers to land, water and other natural resources. The tenure status influences productivity and conservation of the resources. The Project is designed as a "pilot" program to test methods for intervention and to identify policy reform issues for GSL consideration.

The SCOR sub-project adopts a methodology which has been used in other natural resources management approaches in Asia and particularly in water management in Sri Lanka: building small, local organizations around the use of common resource using "catalysts" backed up by experienced specialists, in-site training, and support of local authorities. This institutional effort, facilitation, training and dialogue has proven to be essential to identify common interests, coalescing group dynamics, and developing the new incentive structures. In addition, drawing economic, technical, political and informational resources from external sources are also important to this organizational process. Therefore, SCOR consists of a substantial level of Sri Lankan specialist assistance to provide technical, organizational, financial and training services in four sets of activities:

The SCOR sub-project was approved on March 24, 1993 by amending the Natural Resource Environmental Project (NAREP) Agreement. Subsequently, USAID signed a US \$2.53 million Cooperative Agreement (CA) with International Irrigation Management Institute IIMI on May 24, 1993 for the implementation of the initial phase of the project.

SCOR is implemented in phases. In the first phase with full operational in two pre-selected watersheds, Huruluwewa and Nilwala located respectively in the North Central and Southern province of Sri Lanka. After two years an intensive evaluation would review progress and lessons learned and provide guidance for a possible extension of SCOR activities to further watersheds.

The sub-project activities are being carried out through watershed working groups or water resources management teams at the local level made up of local officials and representatives of user group. These teams are being guided by provincial steering committee chaired by the chief secretary to ensure inter-disciplinary and inter-project collaboration. At the national level a steering committee consisting of several government ministries, non-governmental organizations, implementing organization representatives and USAID officers are providing national focus for monitoring project activities and policy dialogue and directions.

The SCOR sub-project was to be funded by \$7.0 million from USAID and US \$3.135 million contributed by the host country. The total obligation to date is US \$2.26 million.

The sub-project has been a key component of NAREP program and is to enhance the share of user control through state-user partnership that contribute to intensified and sustainable agricultural production while protecting the physical, biological and social environments. The main intervention activities in Huruluwewa watershed are:

- Stabilization of chena and encroached lands;
- Regenerate Tank Eco-system;
- Integrated water management;
- Sharing resources for improved homestead;
- Ground water development and management;
- Land Consolidation in Minor Tanks;
- Organizing user groups/organizations/sub-councils for production, protection and related services.

The main intervention activities in Nilwala watershed are:

- Shared Management of Land and Water Resources;
- Sharing Resources for Improving Homesteads;
- Improve Tea Paddy Culture;
- Organizing groups for improved production, protection, marketing and related services;
- Integrated planning and coordination.

An intensive evaluation was planned at the end of the initial phase as a basis for a decision to extend the project through its full six year life. This intensive evaluation was planned during the negotiations of the project with the GSL and IIMI for various reasons including: a) whether IIMI could carry out the project; b) whether AID would have funding to continue; and c) whether GSL and communities would support SCOR concepts because of its innovative and experimental nature.

Since the inception of the project SCOR has shown good progress and it was apparent that a decision to continue is an important issue because many interventions already started need time to allow completion and show results. Therefore, an evaluation is to be planned during the first quarter of 1994 to review progress and lessons learned and provide guidance on the possible extension of the through full six year period.

## **II. Scope of Work**

The evaluator will conduct the project evaluation by: (a) reviewing project documents, reports and other background materials and related reports pertaining to Sri Lanka; (b) interviewing project staff of IIMI, USAID and NAREP; the Ministry of Forests and Irrigation; the Ministry of Lands, Ministry of Environment and Parliamentary Affairs, GSL agencies at the Provincial, Divisional and at field level, users/user-groups, banks, private business persons and NGOs; (c) traveling to two pilot watersheds, namely Huruluwewa and Nilwala, Field offices, homesteads, farms and other facilities; and (d) obtaining and reviewing other relevant information from other sources, as available.

The evaluators will perform the following tasks:

- A. Assess the performance of the SCOR activities or interventions implemented in the Huruluwewa and Nilwala watersheds. These will include:

- achievement of the project compared to planned target, with particular attention to resource users and user-groups;
- adherence to project conditions and covenants;
- project administration for project implementation;
- the strategies, work plans, and implementation procedures and activities carried out under the project;
- specific constraints to achievement of project objectives;
- monitoring system established and its usefulness;
- research activities started;
- sub-grant component and its management.

**B. Determine to what extent project interventions are sustainable, appropriate and potentially effective to the objectives of the project and USAID/Sri Lanka's strategic objectives. This will include:**

- policy initiatives and dialogue effectiveness;
- the degree of maturity of user-groups formed around various activities such as conservation and production;
- change of land use practices, adoption of new conservation practices;
- the users level of understanding of SCOR concepts and principles through awareness creation;
- degree of coordination of various stake-holders and the GSL officials/agencies commitment on the project;
- how SCOR focuses directly on AID three program objectives namely economic growth, democracy, environment;
- income generation activities and the benefits;
- land tenure aspects.

**C. Recommend action on the GSL and USAID/Sri Lanka relevant to extending the Project.**

**D. Recommend any possible improvements to help assure SCOR goals and targets will be met, if extended for a six year life project. This will include:**

- in-depth review of current, major activities and targets in order to assess the clarity and adequacy of these activities in achieving the project goals, outputs, objectives and goals in the context of project's assumptions, purpose. In addition, suggest changes to those activities and targets;
- examine the constraints to achievement of the objectives and recommend strategies to overcome these constraints;
- assess the adequacy of the steering committee mechanism and the project organization for problem solving and formulating strategy;
- examine the current status of the research work, their relevance to the constraints in the management of the watershed resources and the appropriateness of the present research to support project implementation;
- adequacy of M&E and information system in generating the required output, its data collection, storing, analyzing and reporting. In addition, assess the adequacy of the monitoring information for decision making and dissemination;

- any modification or adjustment to the current policy implementation agenda supported by the project and assessment of whether the current agenda is achievable during LOP.

E. Assess the capacity of (a) IIMI and (b) SCOR-IIMI team in implementing SCOR to achieve full benefits, end of project outputs, and impacts and to spread impact of the Project.

F. Prepare a draft "Project Evaluation Summary."

G. Assess the Financial position of the project. The contractor will make an assessment of the financial situation of the project as of date and make recommendation whether funds remaining are sufficient to achieve the project's goals and objectives; and, in the event funds remaining are in excess, identify the project element(s) concerned and recommend a shift of funds to other project element(s) or recommend de-obligation of funds if deemed necessary.

### III. Level of Effort

The total level of effort for the evaluation will be 86 person days divided as follows:

|  |                 |
|--|-----------------|
| Expatriate Team Leader -- Social Scientist | 30 working days |
| Expatriate Watershed Management Specialist | 24 working days |
| Local Social Scientist                     | 20 working days |
| Local Economist                            | 15 working days |

A six day working week is authorized in-country.

### IV. Qualifications

#### Team Leader — Social Scientist (Expatriate)

1. Advanced university degree in sociology/social anthropology with strong background in participatory approaches;
2. Minimum 10 years project management or field experience (preferably in a developing country) in work dealing with social formation, social institutions, social planning and social impact assessment related work in user group formation and participatory approaches;
3. Experience in implementing and evaluating AID environmental/natural resources management projects including meeting AID evaluating requirements of Handbook 3;
4. Analytical and leadership skills to lead a multi-disciplinary team of evaluators;
5. Report writing skills.

The team leader must be familiar with and be able to make recommendations regarding the ongoing and "in the pipeline" central and regional AID projects that complement and strengthen the SCOR sub-project to be supported over the next four years.

**Watershed Management Specialist (Expatriate)**

1. Advanced university degree in geography/ecology or agro-forestry or natural resources management with focus on land and water management;
2. Minimum of 10 years field experience in formulating, implementing, monitoring and evaluating natural resources management projects;
3. Experience in practical approaches of ecological principles in conservation of natural resources;
4. Report Writing Skills.

**Institutional Development Specialist (Local)**

1. University degree or equivalent in a field relevant to watershed management;
2. 10 years work experience (in a developing country) in forming, strengthening, monitoring and evaluating resources user groups, organizations, training, institutional building and related policy issues;
3. Report writing skills.

**Economist (Local)**

1. Advance university degree in Agricultural/Resource Economics with strong background in quantitative techniques and natural resources or environmental economics;
2. Field experience in watershed management and participatory approaches with user/farmer organizations is highly desirable.
3. Report writing skills.

**V. Deliverables**

Within four days of arrival of the evaluators in country, the team leader will submit for USAID and Ministry of Forestry and Irrigation (MFI) review and concurrence a schedule/time-line of events leading to the completion of the evaluation.

Twenty days after the start of the evaluation, the team leader of the evaluation team will deliver a first draft (10 copies) of the evaluation report to the GSL and USAID. The GSL and USAID will comment on the draft and return the comments to the team leader within 3 working days. The team leader will issue a final report (15 copies) incorporating the mission's and GSL comments before leaving Sri Lanka

and completing the contract. The team leader will ensure delivery of 25 bound copies and a copy of the final report on diskette (in Word Perfect 5.1) before payment for the evaluation services will be made. The team leader will also leave a draft of the Project Evaluation Summary document (AID/W requirement) with the mission before departure.

#### **IV. Relationships and Responsibilities**

The team leader will be responsible for coordinating inputs from other team members into a cohesive, integrated evaluation. In addition, the team leader will develop the project format and outline with project manager of SCOR sub-project and establish schedule/time-line of events leading to the presentation of the draft report before departure from Sri Lanka. The project manager is located in the Office of Agriculture and Natural Resources. The team leader is responsible to the project manager for the satisfactory completion of the evaluation and the report.

The team leader will work closely-with MFI, IIMI field and Colombo staff to complete the evaluation.

#### **VII. Logistics**

The team leader will be responsible for arranging all in-country transportation, office space, secretarial and other office support, computer equipment and communication service. The team leader will make all the international travel arrangements (in accordance with USG regulations) and hotel reservations.

**ANNEX B**

**MEMBERS OF THE DAI EVALUATION TEAM**

**TEAM LEADER — SOCIAL SCIENTIST (Expatriate)**

**Bruce Harker** is a development policy specialist and project manager with 25 years of experience, 18 of which have been in South and Southeast Asia. He is a senior member of the development staff of Development Alternatives, Inc. (DAI) who has managed natural resources and watershed development projects for DAI and USAID since 1980. Dr. Harker holds a B.A. in psychology from Oberlin College and an M.A. and Ph.D. from the Division of Social Sciences of the University of Chicago.

**INSTITUTIONAL DEVELOPMENT SPECIALIST (Local)**

**N. G. R. De Silva** is an irrigation management and water resources policy specialist, who has been Director of Irrigation and Secretary to the State Ministry of Irrigation in Sri Lanka as well as Director of the Secretariat of the USAID-Sri Lanka Irrigation Management Policy Support Activity Project. He is currently Managing Director of the Mahaweli Economic Agency of the Mahaweli Authority of Sri Lanka. Mr. De Silva is a Member of the Institute of Civil Engineers (London), a Fellow of the Institute of Engineers (Sri Lanka) and holds a post-graduate Diploma in Hydrology from the University of Delft, Netherlands.

**ECONOMIST (Local)**

**Percy Silva** is an economic geographer who taught geography in Sri Lankan universities and advised Sri Lankan land policy for over 20 years. He joined FAO in 1985, functioning as Director of the Sri Lankan Land Use Policy Planning Division following which he also worked for FAO in Liberia, Italy and the Philippines from 1988 to 1994. Dr. Silva holds a B.A. from the University of Ceylon and an M.A. and Ph.D. from the University of Toronto.

**WATERSHED MANAGEMENT SPECIALIST (Expatriate)**

**William McDowell** is a watershed management consultant specializing in community-level soil and water conservation, conservation farming, training and extension, and water resource development programs. He has worked as a private consultant in the western USA, Central America, and South America, including six years in Bolivia for Development Alternatives, Inc. (DAI) as an advisor to two long-term USAID-funded projects. Mr. McDowell holds a B.A. in biology from Carleton College and an M.S. in watershed management from the University of Arizona.

**ANNEX C**  
**LIST OF PERSONS CONTACTED**

**SCOR-IIMI STAFF, SRI LANKA FIELD OFFICE**

1. Dr. C.M. Wijyaratna, Director SLFO, SCOR Project Leader
2. W.A.A.N. Fernando, Research Associate, Water Resources
3. G.P. Batuwitige, M&E Specialist
4. Dr. K. Jayawardena, Research Officer
5. P. Ragasekara, Coordinator, Human Resources Development
6. R.B. Bandula Sirimal, Research Officer

**Huruluwewa Watershed Team**

1. R.M. Karunaratne, Acting Team Leader
2. N.K. Adikaramge, Enterprise and Marketing Development
3. P.G. Karunaratne, Watershed Management Coordinator
4. G. Karunaratne, Watershed Management Coordinator
5. Ms. T.M.M.C.K. Tennekoon, Organizer, Women and Youth
6. Dr. L. Weerakoon, Agro-forestry/Forest Management Consultant
7. J.P.K. Kotuwegedara, Research Officer
8. W.R. de Silva, Catalyst, Garandiyalupotha
9. Sarath Wijesinghe, Catalyst, Padikaramaduwa
10. J.M.S. Jayasundara, Catalyst, Kokawewa
11. W.M. Navaratna Banda, Catalyst, Puwakpitiya
12. Nihal Ranatunga, Catalyst, Meegaswewa
13. M. Wimalasiri, Catalyst, Welangolla (feeder canal)
14. SCOR Farmers (Huruluwewa) — various from six villages

**Nilwala Watershed Team**

1. T.K. Warnasuriya, Acting Team Leader
2. K.N. Jayasuriya, Enterprise and Marketing Development
3. W. Kuruppu, Watershed Management Coordinator
4. D. Wijenayake, Watershed Management Coordinator
5. K.P. Sri Bharathi, Agro-forestry and Forest Management
6. E.A.P.N. Edirisinghe, Research Officer
7. N.R. Yapa, Catalyst, Horagala
8. Ms. M.P. Kusumawathie, Catalyst, Diyadawa-Tenipita
9. Ms. P.P.G.P. Kumari, Catalyst, Milla Ela
10. H.M.A.S. Bandara, Catalyst, Milla Ela
11. G.G.C.D. Premakumara, Catalyst, Diyadawa-Tenipita
12. R.M. Weerasinghe, Catalyst, Aninkanda
13. SCOR Farmers (Nilwala) — various from four watersheds

**IIMI INTERNATIONAL HEADQUARTERS**

1. Randolph Barker, Interim Director General
2. Marian Fuchs-Carsch, Donor Relations and Project Development
3. Jacob W. Kijne, Director for Research
4. Jeff Brewer, Social Scientist

### **NATIONAL GOVERNMENT OFFICIALS**

1. D.M. Ariyaratne, Secretary of Ministry of Agriculture, Lands and Forests
2. H. M. Bandaratileke, Conservator of Forests
3. Dayananda Kariyawasam, Additional Conservator of Forests
4. Jaliya Medagama, Secretary, Ministry of Irrigation, Power and Energy
5. L. U. Weerakoon, Additional Secretary, Ministry of Irrigation, Power and Energy
6. Rangith Ratnayake, Acting Director, Irrigation Management Division, Ministry of Irrigation, Power and Energy

### **PROVINCIAL AND DIVISIONAL AGENCY OFFICIALS**

1. U.G. Jayasinghe, Chief Secretary, North Central Province
2. W. Guruge, Secretary, Ministry of Agriculture, Coordinator, NCP Provincial Steering Committee
3. A. Rathnayake, Chief Secretary, Southern Province
4. C. Ranasinghe, Coordinator, Provincial Steering Committee, Southern Province
5. M.B. Cyril, Regional Manager, Tea Small Holding Authority, Galle
6. R. Abeysekara, Provincial Director (SP), Agriculture
7. Mr. Weerasinghe, Provincial Director (SP), Agrarian Services Department
8. L.D.B.Premaratna, Divisional Forestry Officer, Galle
9. A. Samaraweera, Veterinary Surgeon, Kotapola
10. Ms. Kamala Jayasinghe, Livestock Development Instructor, Kotapola
11. S.B. Rajapaksha, Divisional Secretary, Kekirawa (NCP)
12. H.M. Dharmapala, Assistant Divisional Secretary, Galenbindunuwewa (NCP)
13. B.A. Sumanadasa, Assistant Divisional Secretary, Palugaswewa (NCP)
14. H.B. Kulatunga, Divisional Officer, Palugaswewa (NCP)
15. B.M.C.K. Dissanayake, Agricultural Instructor, Palugaswewa
16. N.U. Hemakumara, Irrigation Department Engineer, Huruluwewa
17. W.M. Mudiyanse, President, Tract 6 Farmer Organization, Huruluwewa

### **USAID STAFF AND CONTRACTORS**

1. Gary Alex, Chief, Office of Agriculture and Natural Resources, USAID/Sri Lanka
2. Richard Nishihara, Office of Agriculture and Natural Resources, USAID/Sri Lanka
3. Glenn Rutanen-Whaley, Projects Office, USAID/Sri Lanka
3. Avanthi Jayatilake, Project Manager, NAREPP, Projects Office, USAID/Sri Lanka
4. Mohan Siribaddana, Project Manager, SCOR Sub-project, Office of Agriculture and Natural Resources, USAID/Sri Lanka
5. Louis Kuhn, Chief, Office of Program, USAID/Sri Lanka
6. David McCauley, Chief of Party and Senior Environmental Policy Advisor, NAREPP/IRG, USAID/Ministry of Environment and Parliamentary Affairs
7. Edward Scott, Training Coordinator, Environmental Management and Institutional Development Advisor, NAREPP/IRG, USAID/Ministry of Environment and Parliamentary Affairs
8. U.G. Abeygunawardena, Farmer Organization Specialist, MARD/MDS Projects, USAID/DAI
9. Martin West, Agonomist/Horticulturalist, MARD/AgEnt, USAID/DAI

**OTHER**

1. **Wouter T. Lincklaen Arriens, Rural Development Specialist, Asia Development Bank**

**ANNEX D**  
**LIST OF REFERENCE DOCUMENTS**

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**ANNEX E**

**SCOR PROGRESS BY MAJOR OUTPUT INDICATORS**

PROGRESS BY MAJOR OUTPUT INDICATORS  
FOURTH QUARTER 1994

|    | OUTPUT<br>TARGETS/PERFORMANCE   | LOP<br>TARGET | TOTAL<br>END OF<br>4th QTR. | %    | REMARKS   |
|----|---|---------------|-----------------------------|------|---|
| 1  | # of user groups formed   | 150           | 165                         | 110  | 66 (NILWALA), 99 (HURULU)   |
| 2  | # Of training opportunities to user groups  | 600           | 1918 *                      | 320  | 1032 (NILWALA), 886 (HURULU)  |
| 3  | # of User Organizations   | 20            | 42                          | 210  | Existing organizations included   |
| 4  | Training opportunities to representatives of farmer organizations   | 75            | 1680 *                      | 2240 | 458 (NILWALA), 1222 (HURULU)<br>This includes representatives of existing organizations   |
| 5  | # of Sub-user councils  | 2             |                             |      |   |
| 6  | Representatives of User Sub-councils/councils trained   | 8             |                             |      |   |
| 7  | # of small grants made to user groups to invest into common user group assets   | 75            | 57                          | 76   | 31 in Huruluwewa, 26 in Nilwala   |
| 8  | # of user organizations conferred with legal status and powers  | 20            | 42                          | 210  | 16 of these are existing organizations participating in decision making in WRMT that has authority conferred to approve the SCOR work plan and to approve user grants upto Rs.25,000/grant.<br>2 new organizations were registered. |
| 9  | Modes of commercial opportunities developed and/or supported for user groups  | 10            | 22                          | 220  | The identified commercial activities are being supported.<br>4 service organizations have been formed to support commercial activities.   |
| 10 | Production companies established and linked to new markets  | 2             |                             | 0    | The first farmers production company is being formed.   |
| 11 | # of rural based commercial activities linked to new markets and provided with matching grants                            | 50            | 39                          | 78   | 20 in Huruluwewa and 19 in Nilwala watershed  |
| 12 | Land leasing/usufruct processes facilitating establishment of (1) production companies                                    | 2             |                             | 0    | NSC deliberated on granting long term user rights. Action in progress   |
| 13 | (2) Commercial activities   | 50            |                             | 0    |   |
| 14 | Demonstrations of authorizing user groups, joint consolidated land management/production systems in minor tanks           | 5             | 2                           | 40   | This work involves a continuing process that has now been started.  |
| 15 | Training opportunities in local level planning group formation, support and collaboration to officials                    | 80            | 306 *                       | 383  | 202 (Nilwala), 104 (Huruluwewa)<br>This number indicates the number of training opportunities offered to officers. The same officer may have received different training at different occasions.                                    |
| 16 | # of NGOs and other private sector organizations providing technical managerial and commercial information to user groups | 8             | 8                           | 100  | ITDG helps Nilwala resources users on feasibility of a mini-hydro power project.<br>Colombo trade Chambers, Sri Lanka Canaries, SANASA, and AGENT supports Huruluwewa resources users.  |

LOP = Life of Project Target

\* Awareness creation excluded

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**ANNEX F**  
**SCOR ACTION RESEARCH PROJECTS**



ACTION RESEARCH

|     | Name of the Researcher  | Name of study   | Value (Rs) | Classified according to Researcher                    | Classified according to the nature of Research    | Classified according to Objectives |
|-----|---|---|------------|---|---|------------------------------------|
| (1) | Land Use Policy Planning Division (LUPPD) Ministry of Lands<br>A.Widanapathirana* | Land use maps for two watersheds (Huruluwewa & Nilwala)   | 255,000.00 | Contract Research                                     | -   | Baseline                           |
| (2) | Land Use Policy Planning Division (LUPPD) Ministry of Lands<br>A.Widanapathirana* | Land use studies & preparation of maps for Nilwala watershed  | 610,830.00 | Contract Research                                     | -   | Baseline                           |
| (3) | Land Use Policy Planning Division (LUPPD) Ministry of Lands<br>A.Widanapathirana* | Land use studies & preparation of maps for Huruluwewa watershed   | 463,320.00 | Contract Research                                     | -   | Baseline                           |
| (4) | Prof. B.K. Basnayaka<br>University of Peradeniya<br>(Nihal Fernando*)             | Rainfall trends, surface water balance and vegetation change in the Huruluwewa watershed                                  | 444,587.00 | Contract Research                                     | Collection of new data                            | Land & Water Management            |
| (5) | N.U. Hemakumara<br>(Nihal Fernando*)  | Baseline and M&E studies for intergrated water management in Huruluwewa watershed.  | 260,000.00 | Contract Research<br>( data collection contract only) | Utilizing data base and<br>Collection of new data | Land & Water Management            |
| (6) | N.U. Hemakumara<br>(Nihal Fernando*)  | Agro-well & Ground water management in Huruluwewa watershed   | 285,000.00 | Contract Research<br>( data collection contract only) | Utilizing data base and<br>Collection of new data | Land & Water Management            |
| (7) | M.A.B. Anawaratna<br>(C.M. Wijayarathna*)   | An analysis of demand supply and price-relations aimed at production scheduling   | 13,500.00  | Contract Research                                     | Collection of new data                            | Production and Income Generation   |
| (8) | M.A.B. Anawarathna<br>(C.M. Wijayarathna*)  | Evaluation of profitability and productivity of onions, tomato and rice under different irrigation and technology regimes | 119,000.00 | Contract Research                                     | Utilizing data base and<br>Collection of new data | Production and Income Generation   |

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**ACTION RESEARCH**

|      | Name of the Researcher  | Name of study   | Value (Rs)   | Classified according to Researcher | Classified according to the nature of Research       | Classified according to Objectives  |
|------|---|---|--------------|------------------------------------|--|-------------------------------------|
| (9)  | Sena Ganewatta<br>(C.M.Wijayarathna*)   | Impact of Land Tenure<br>Part 1 – Literature Review   | 80,000.00    | Contract Research                  | –  | Institution &<br>Organization       |
|      | C.M.Wijayarathna<br>Kumudini Jayawardena  | Part 11 – Micro level analysis  | Main project | SCOR staff only                    | Utilizing data base<br>and<br>Collection of new data | Institution &<br>Organization       |
| (10) | C.M.Wijayarathna<br>R.B.Bandula Sirimal   | Potential for improving Labour Productivity<br>in small holdings  | Main project | SCOR staff only                    | Utilizing data base<br>and<br>Collection of new data | Production and<br>Income Generation |
| (11) | Prof.Pinnaduwa & Dr.O.Amarasinghe<br>(University of Ruhuna)                         | Study on crops/livestock yield, profitability<br>and other socio – economic aspects in<br>Nilwala Watershed   | 356,500.00   | Contract Research                  | Collection of new data                               | Production and<br>Income Generation |
| (12) | Arjuna Hulugalle<br>(G.Batuwitage*,<br>N.Adhikaramge)                               | Feasibility study on Production<br>& processing of Medicinal plants –<br>a component of land & water<br>conservation efforts in the dry zone                                  | 30,000.00    | Contract Research                  | –  | Production and<br>Income Generation |
| (13) | V.Jayamanna – Bsc Student<br>(C.M.Wijayarathna*)                                    | A study on adoption of Technology<br>in the tea sector in Upper Nilwala<br>watershed.   | 14,000.00    | Contract Research                  | Collection of new data                               | Production and<br>Income Generation |
| (14) | Mr.Razaak – ARTI<br>(C.M.Wijayarathna*)   | Process Documentation of SCOR   | 294,400.00   | Contract Research                  | Utilizing data base<br>and<br>Collection of new data | Institution and<br>Organization     |
| (15) | I.K.Weerawardena<br>(P.Rajasekara*)   | Action Research study on Institutional<br>support for projects of Resources<br>user organizations   | 201,000.00   | Contract Research                  | –  | Institution and<br>Organization     |
| (16) | Mr.D.M.Ariyaratna<br>(P.Rajasekara*)  | Action research study on Special SCOR<br>interventions in the Huruluwewa feeder<br>canal area   | 112,500.00   | Contract Research                  | –  | Institution and<br>Organization     |
| (17) | G.Batuwitage, C.M.Wijayarathna,<br>P.Rajasekara, Jaliya Medagama<br>& N.Adhikaramge | Policy research related to organizational<br>and business modes for production and<br>protection, ranging from informal groups to<br>production/processing/ service companies | Main project | SCOR staff only                    | Utilizing data base                                  | Policy Research                     |

**ACTION RESEARCH**

|      | <b>Name of the Researcher</b>                             | <b>Name of study</b>  | <b>Value (Rs)</b> | <b>Classified according to Researcher</b> | <b>Classified according to the nature of Research</b> | <b>Classified according to Objectives</b> |
|------|---|---|-------------------|---|---|---|
| (18) | P.Rajasekara –Based on I.K.Weerawardena's action–research | Policy reasearch related to state–user partnerships and obtain legel recognition                                      | Main project      | SCOR staff only                           | Utilizing data base                                   | Policy Research                           |
| (19) | SCOR team and Government officers                         | Land Consolidation in small tanks   | Main project      | SCOR staff only                           | Utilizing data base                                   | Institution & Organization                |
| (20) | SCOR team   | Baseline survey of Watershed management in regard to resources use  | Main project      | SCOR staff only                           | Utilizing data base                                   | Production and Income Generation          |
| (21) | J.M. Jayasundera Banda & SCOR Team                        | M & E of Conservation Measures in Huruluwewa Watershed.   | Main project      | SCOR staff only                           | Utilizing data base                                   | Land & Water Management                   |
| (22) | Dr. Colin Peiris  | Biodiversity of Medicinal and other tree species in the Huruluwewa Watershed with emphasis on their economic utility. | 251,850.00        | Contract Research                         | Collection of new data                                | Production and Income Generation          |

\* Co-ordinator

Total: 3,791,487.00

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