

SHARED CONTROL OF NATURAL RESOURCES (SCOR)
- A MARKET ORIENTED WATERSHED MANAGEMENT STRATEGY-
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Executive Summary

This paper examines the concepts, strategy and outputs of a Participatory Action Research Project on Watershed Management. The Project, Shared Control of Natural Resources, SCOR, hypothesized that a package of measures such as crops/livestock/fish production, appropriate soil and water conservation practices and user rights connected to economic benefits, is more effective in conserving natural resources. The package, formulated jointly by professionals and resource users, focused on the needs of small farmers/users such as an appropriate cash flow and profits as well as non monetary benefits in return for action on conservation. With watersheds as basic units, SCOR operated at multiple levels. At the lowest level, the sub- or micro-watershed, which typically included a couple of villages, the local officials, resource users, and SCOR catalysts/change agents, interacted to understand the present resource use pattern, developed a vision for the future and translated it into action plans followed by action and monitoring and evaluation. The Project's experiences have been utilized in Policy formulation, specially in the establishment of Farmer Companies.

1. INTRODUCTION – THE PROJECT DESIGN

This paper examines an **action-research** project on participatory management of natural resources in a watershed context. It was aimed at *developing and testing* a holistic approach to integrate environmental and conservation concerns with production goals. The project, namely the Shared Control of Natural Resources, SCOR, funded by the United States Agency for International Development (USAID) has been implemented (September 1993 to October 1998) by the International Water Management Institute (IWMI) in collaboration with the Government of Sri Lanka, resource users and selected Non-Governmental Organizations (NGOs). The project concepts and strategies were developed through a unique participatory project design process spearheaded by a core group of experts including senior policy makers and other Government staff associated with the management of land and water resources of Sri Lanka. The design process included a review of past experiences in the management of natural resources in Sri Lanka and elsewhere, a series of consultations with a cross section of resource users, government officials at various levels, development banks and representatives of non-governmental organizations (NGOs).

The SCOR design was built on the progress already made in Sri Lanka and elsewhere in participatory irrigation management and social forestry. In Sri Lanka, as in many other

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developing countries, there is an urgent need for more intensive, but environmentally appropriate utilization of its natural resources base, particularly land and water resources, for profitable and sustainable agricultural and related industrial production. There is an increasing body of evidence from Sri Lanka and other countries that farmers, even those with very small holdings make production responses to the economic environment within which they carry out their farming activities. *These responses are largely influenced by the availability of competitive markets, production inputs and other support services; the availability of information on profitable enterprises, production technologies, value-added production and competitive markets; the degree of control the users can exercise over their means of production -- such as the tenurial security or usufructuary rights-- etc.* These facts need to be considered in designing strategies to integrate conservation with production. For example, profitability of conservation practices to the small farmer is an important determinant in the adoption process. On this basis the design team hypothesized that the natural resources base, particularly land and water, can be conserved and their productivity could be sustained if environmental and conservation concerns are incorporated into the production process.

PROJECT CONCEPTS, STRATEGY AND OBJECTIVES.

The prime **goal** of this **action-research** project was to develop and test strategies to increase the sustainable productivity of the natural resources base in Sri Lanka in ways that will equitably improve the livelihood of the people now and in the future with due regard to the *environment*. A participatory analysis of constraints to the potential for sustainable increase in productivity of land and water resources paved the way to SCOR concepts and strategy. Four types of major constraints have been identified in relation to environmentally appropriate increases in production.

- (a) The lack of a *production environment* (including profitability, security of tenure and local control of resources) that motivates the resources user to effectively manage the combination of resources essential to optimize economic production while conserving land and water resources
- (b) The lack of an effective combination of technology, skills, incentives and (mechanisms to enforce) penalties that encourage *internalization of environmental considerations into management decisions*.
- (c) The lack of adequate information about land and water resources management at appropriate levels.
- (d) Institutional and organizational constraints, including inadequate coordination between projects/activities of land and water resources development. (SCOR Project Proposal, IIMI, 1993).

Therefore, SCOR strategy was aimed at striking a balance between "production" and "protection" in relation to the utilization of land and water resources through the intensification and institutionalization of participatory and shared management processes coupled with appropriate technologies and resources. In addition, the Project intended to identify policy changes that may help to adapt this strategy in other areas of Sri Lanka and elsewhere under similar conditions.

The SCOR concepts, strategies and major areas of activity are summarized in Figure 1. *The focus on watersheds as the basic planning, coordinating and implementation unit is an important feature of SCOR.* The term watershed is defined as the area of land surface that drains water into a common point along a stream or river. Various parts of the watershed is physically and operationally linked in important ways, and the potential benefits from integrated use can be large. For example, the SCOR Huruluwewa watershed contains about 220 small tanks (in addition to the major reservoir). Most of these small tanks are in series of clusters or in cascades. In addition, ground water extraction from the weathered rock up to a depth of about 10 m is taking place at an increasing rate. No regulations or accepted norms have been adopted with regard to well density, spacing between wells, pumping duration etc. Moreover, the people in the different components of the watershed having access to different aspects of the natural resources base are engaged in different economic activities, and are of different social and/or cultural backgrounds. For example, people in the upper catchment have very different environmental, economic and social conditions from those in associated irrigated commands and those in downstream areas of the irrigated areas. Hence it was assumed that institutional linkages (e.g. federation of user organizations) between different segments (e.g.: upstream and downstream) of the watershed would promote profitable and sustainable use of land and water resources. SCOR project expected to assist the Government of Sri Lanka (GSL) to identify, develop, and field test a strategy for increasing the sustainable productivity of natural resources - mainly land and water - in a watershed context. (SCOR Project Proposal, IIMI, 1993).

The Project identified the *need for enhancing the information and the understanding* (of the government, user-groups and individuals) about potentials of and prospects for the natural resources (land and water) base for production and protection. It was assumed that an adequate knowledge of the natural resource base and resource use of a watershed is essential in designing, planning and implementing management interventions which would be mutually beneficial to different segments of watershed. Knowledge about resources base information systems and capacity building were considered as necessary conditions for decentralized management of natural resources. The project expected to test methods of local/shared/community management of land and water resources and, understanding the resources base, developing information systems and building capacity were assumed to be integral components of such efforts.

In summary, the SCOR strategy was to catalyze a process to motivate partners to use an integrated package of technology, organization, resources and policies through collaborative initiatives. The appropriateness of this strategy has been tested and demonstrated in two pilot watersheds in Sri Lanka (namely Huruluwewa in the North Central Province and Nilwala in the Southern Province) chosen for their different social, agricultural and environmental characteristics. *In these pilot areas, appropriate production and conservation techniques and technologies have been used to augment and sustain the resource base and its productivity through active involvement of small farmers in competitive markets, participatory processes, novel modes of tenurial arrangements, and state-user partnerships.*

THE INTERVENTION PROCESS.

With watersheds as basic units, SCOR operated at *multiple levels* with different organizational arrangements that are vertically integrated. At the lowest level, the sub- or micro-watershed, which typically includes a couple of villages, the local officials, the resource user organizations, and SCOR catalysts/change agents, interacted to understand the present resource use pattern, developed a vision for the future and translated it into action plans. At the divisional and watershed levels, the officials, representatives of farmers and SCOR professionals discussed plans emerging from grass roots levels.

The project has selected about 25 sub-watersheds ranging from 75 ha to 600 ha. for interventions. In the sub-watershed, a participatory appraisal of the characteristics of resource uses and users as well as mapping of current resource use were done by groups comprising of resource users, NGO, Government agencies and SCOR project team. Subsequently, a participatory resource management “mini project” was formulated. The “mini-project” aimed at changing the present land and water use pattern to a more profitable yet environmentally sound resource use. Measures adopted by the implementation team in order to improve the *accuracy of the information base, efficiency of action-research and the acceptance by partners* at different stages of project implementation (specially at the *participatory appraisal, formulation of “mini projects” at sub watershed level, implementation, monitoring and evaluation*) included: *participatory* mapping using air photographs; walk-through surveys; use of different sources of data and the use of Geographic Information Systems, GIS; participation of a mixed group of participants including resources users, local officers, scientists and catalysts at all stages of the project. This strategy was proved to be useful in developing a “sense of ownership”, belonging and commitment for action by users and other partners.

As constraints to group activities are identified, the project assisted in their removal. When the constraints are the result of policies, rules, regulations, or actions of a higher level, the project worked at those levels to achieve its purposes. Underlying assumption was that *demand-driven changes* are likely to be more expeditiously addressed than recommendations for change from above. It was expected that the project would be guided at different levels—divisional, provincial and national-- by a system of committees, which united resources users, state officials and other professionals. At the provincial level, which covered several divisions, action was mostly related to the review of progress and remedial measures to cover gaps in line agency functions, and interdepartmental relations. At the national level, primary emphasis was on relevant changes in policy and processes, based on experiences from interventions at lower levels.

THE OUTCOMES AND IMPACTS.

The Project’s performance in terms of the achievement of targeted outputs is summarized in Table 1. This section will first present a brief account on farm and sub-watershed level

outcomes by analyzing the “past and present” status of a typical sub-watershed (namely *Puwakpitiya*) in the SCOR Huruluwewa watershed. Next, a summary of selected SCOR achievements in the policy area will be presented. Finally the constraints encountered by SCOR will be outlined.

Mini project in Puwakpitiya, like in other SCOR sample sub-watersheds, aimed at changing the pre-project *land and water use pattern to a more profitable and diversified resource use pattern. This was attempted by combining production and conservation using appropriate technologies/ techniques; novel shared control arrangements and resource augmentation.* New commercial enterprises and conservation practices included: integrated wet and dry season water management in command areas e.g., water saving techniques to improve cropping intensity and introducing short duration commercial crops like soybean in the dry season, fish farming, participatory forestry and stabilized cultivation (of field crops such as maize for an identified market, medicinal plants, fruits and vegetables) coupled with conservation methods - - such as contour or graded bunds, alley cropping, mulching, water harvesting, green manuring, integrated pest management, mixed cropping and integrated livestock farming, combination of agriculture and forestry, etc.- - in areas hitherto used for “slash and burn” or shifting cultivation. This means that the villages in such pilot sub-watersheds have had “action plans” that guided them along a path to the planned future from the current status of resource use. The pre-project land use pattern is illustrated in *figure 2* (and Table 2) while the “planned/future vision” and end of project status (as of September 1998) are illustrated in *figures 3 & 4*(and Table 2).

In “mini projects”, novel modes of state-user partnerships in land use (such as the long-term usufructuary rights for participants who do not “own” the land) have been arranged. SCOR learning experience suggests that the issue of property rights should be treated in the context of culture, local values and local market conditions. For example, a complete transfer of ownership of land and water to individuals (i.e. individual property rights) may be important in some cases while in certain other cases - such as irrigation canal or natural stream reservations -instead of exclusive individual property rights the concepts of *shared control*, usufructuary rights, longer-term lease arrangements, and *state-user partnerships* may provide adequate incentives to the users to maintain a good balance between production and protection. Such alternatives to exclusive individual property rights may provide the respective natural resources users a *sense of ownership*.

As profit is a major determinant in the adoption of conservation based production, and in order to achieve scale economies as well as adequate bargaining power, SCOR facilitated the formation of three Farmer Companies in pilot areas. For example, farmers in all the sub-watersheds in the Huruluwewa watershed have become shareholders of “Hurulu” and “Dambulu” Farmer Companies. These two companies have already assessed the potential of producing special crops for special markets, entered into forward contracts with those identified markets, and “honored” such contracts. The Farmer Companies have obtained loans and extended production credit to share holders through farmer organizations. The farmer organizations function as the “production and collection coordinators” of the companies. In the SCOR pilot areas resource users, mainly the small farmers, have proved that, with effective external catalyzing inputs, they can mobilize resources to carry out their

plans and finally become shareholders of their own companies managing the production process, which is an effective way of small farmers to gain and share prosperity in an open economy.

The significant policy changes initiated by SCOR includes:

- grant of usufructuary rights for using state reservations (such as irrigation reservations, on pilot basis in Huruluwewa and Nilwala);
- Government's acceptance of "Farmer Company" strategy and a). The decision by the Ministry of Agriculture to include the formation of farmer companies as a function of the Department of Agrarian Services; b). Testing Irrigation Management Turn-Over using Farmer Company Strategy;
- decision to establish an agricultural settlement incorporating "encroachers" in the Huruluwewa upper watershed;
- granting of body corporate status to Tea Small Holders Societies;
- legal recognition of watershed-based farmer organizations by the government (Department of Agrarian Services), even though they are not coterminous with administrative boundaries;
- Extending the mandate of the Irrigation Management Division of the Ministry of Irrigation, Power and Energy, to manage watersheds associated with major irrigation systems.

The SCOR action-research or the "learning process" was not free from constraints. Certain researchers could not understand/accept Participatory Action Research in general, and learning process approach in particular, as research methods. At the same time the project suffered from uncertainties in donor funding, drought conditions prevailed in the dry zone areas during certain crop seasons. Due to the "project-driven" nature of the experiment the researchers were compelled to focus more on targeted physical achievements than the learning process. In regard to the rate of adoption of conservation techniques, it has been observed that many farmers did not adopt them in package form. It should however be noted that most of the recommended practices do not yield substantial benefits in the short term and therefore it is too early to evaluate such aspects of the project. Moreover, the business activities of the Farmer Companies suffered from factors that can be attributed to market failures/imperfections in the market such as the vested interest of some businessmen, rent-seeking behavior etc.

Literature Cited

IIMI, 1993, Shared Control of Natural Resources Project - Technical Proposal, Unpublished report.

IIMI, 1998, Shared Control of Natural Resources Project – Quarterly Progress Report, 2nd Quarter, July 1998.

FIGURE 1 - STRATEGIES / CONCEPTS

- Participatory Action-Research : A Learning Process
- Watershed Focus : Ecosystem Approach
- Integrated Planning in a watershed context
- Integrating Conservation Concerns with Production Goals
- Proper Mix of Technology, Organizations and Resources
- Natural Resources Tenurial Security
- Shared Control : State-User Partnerships
- Building Local Capacities
- Policy and Institutional Interventions.

Combined Effect on Activities

ACTIVITY AREAS:

- Organizing users, participatory planning and implementation
- Co-ordination of watershed activities, skill development & information systems
- Integrated Water Management
- Rice-Based Cropping Systems in Command Areas : Improve Cropping Intensity and Production
- Stabilized conservation farming in catchments/areas presently under shifting cultivation and Conservation Farming in Home gardens
- Community-based Fish Farming
- Agro-based Enterprises – value addition
- Farmer Companies for Organized Production and Competitive Marketing
- Non-Production Incentives for Conservation : e.g.: Micro-Hydropower Generation Coupled with Catchment Conservation
- Special Activities/Programs for Farm Women.

Figure 2: Puwakpitiya sub-watershed – Land use – Baseline – 1994

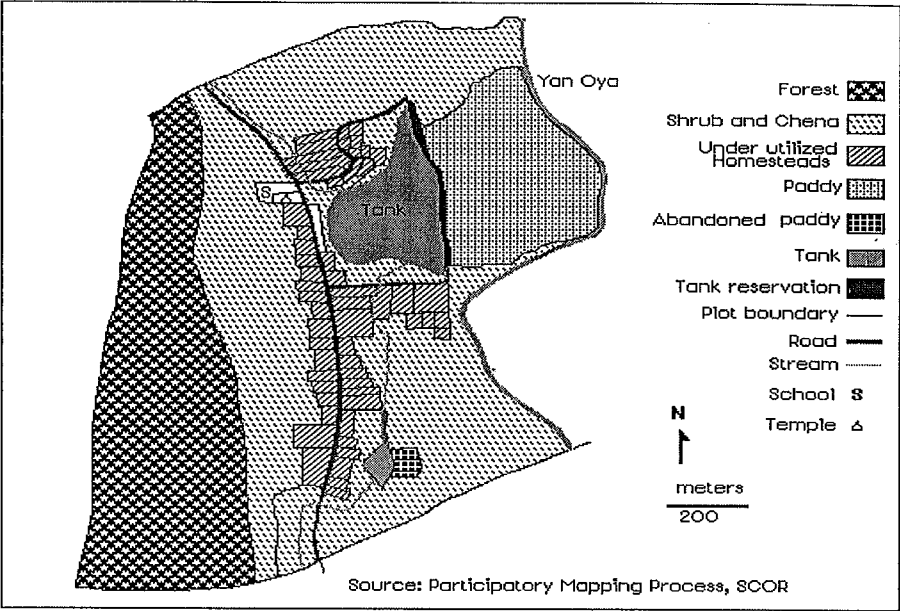


Figure 3: Puwakpitiya sub-watershed – Land use – Future vision

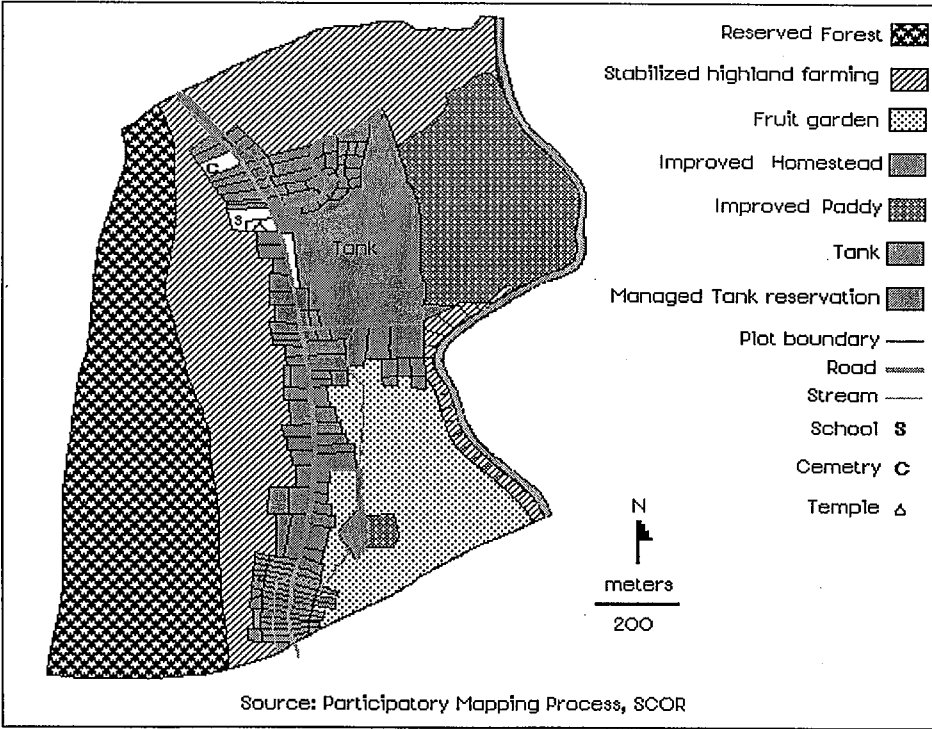


Figure 4: Puwakpitiya sub-watershed – Land use – 1997

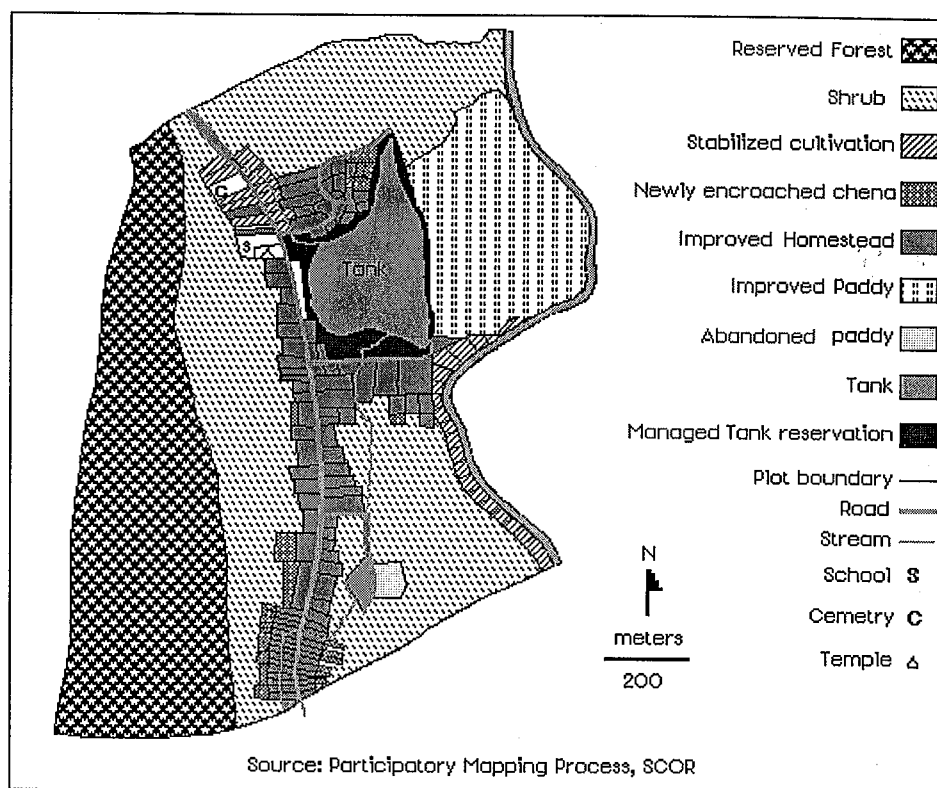


Table 1: Performance in summary by strategic and performance indicators

Indicator	Unit/No	Target Up to 30 Sept. 1998	Total To date
1. Targeted hectares under improved production and protection techniques,	Ha	18,202	14,606
2. Value of targeted investment by the resource users in environmentally sound production practices.	\$(M)	1.0	1.73
3. Targeted land area covered by agreements between GSL and user groups (Extent now under protection and production practices expecting user rights)	Ha.	522	503
4. Farm households using improved environmental techniques	#	12,689	12,615
5. No. of policy/procedures, organisational changes exacted and adopted	#	6	3
6. Number of user organisations conferred with legal status and powers	#	50	85
7. User groups organised/assisted to take joint responsibility for management of land and water resources	#	67	44
8. Number of new commercial activities supported by linking to markets	#	160	138
9. Land leasing/usufruct agreements issued for establishments and functioning of production companies and commercial activities	#	5	2
10. Training opportunities provided to representatives of resource user groups, NGOs and other private sector organisations in participatory natural resources management	#	17,919	17,231
11. Number of officials trained in local level planning, user groups formation, support and collaboration	#	420	430
12. Number of NGOs and private sector agencies providing technical, managerial and commercial information to user groups	#	15	27
13. Research studies completed on natural resources issues	#	25	19

Source: SCOR Progress Report, 2nd quarter 1998(July 1998)

Table 2: Land use— Puwakpitiya

BASELINE STATUS – 1994

Category	Extent (ha)
Forest	39.8
Shrub and chena (Slash And Burn)	73.6
Under utilized homesteads	14.3
Paddy	16.9
Abandoned paddy	0.55
Tanks	8.32
Tank reservation	0.88
School, Temple and Cemetery	0.89
Yan oya (River)	1.31
Roads	1.3
Total	157.9

LAND USE – STATUS – 1997

Category	Extent (ha)
Reserved forest	39.83
Shrub	55.34
Stabilized cultivation	6.31
Newly encroached chena	6.22
Improved homesteads	14.36
Improved paddy	16.9
Tanks	8.32
Managed tank reservation	6.6
Abandoned paddy	0.56
School, Temple and Cemetery	0.89
Yan oya	1.31
Roads	1.3
Total	157.9

LAND USE - FUTURE VISION

Category	Extent (ha)
Reserved forest	39.8
Stabilized highland farming	44.1
Fruit garden	17.5
Improved homesteads	20.6
Improved paddy	17.46
Tanks	8.3
Managed tank reservation	6.6
School, Temple and Cemetery	0.9
Yan oya	1.31
Roads	1.33
Total	157.9