SOME SECULAR THOUGHTS ON IRRIGATION REHABILITATION AND SYSTEM MANAGEMENT

D. M. Ariyaratne

Director Irrigation Management Division

Ministry of Lands, Irrigation and Mahaweli Development

01. Introduction: The "Beneficiary – Alienation" in Irrigation

1.1 The twin-processes of rehabilitation and system management gained emphasis in relation to irrigation management only very recently in the Sri Lankan irrigation situation. They had their genesis in the Irrigation Programme Review that commenced during the mid-sixties in Sri Lanka. This Review emphasized a shift from major irrigation works to medium–scale and village irrigation works from new construction to rehabilitation of existing works and from mono-cropping of paddy to a diversified form of agriculture. Implied in these recommendations was the underlying need to manage the irrigation schemes more efficiently, economically, productively and moreover on a "sustainable basis".

1.2 Such a sustainable pattern of irrigation system management was in vogue in ancient Sri Lanka and a wide range of customs and practices ("sirith") was built into this system which were observed by the community through collective acceptance. The ancient Sri Lankan irrigation restoration/rehabilitation planners considered irrigation not as an end in itself but as an infrastructure to build cohesive and closely-knit social communities (Gambendima) (1). The Colonial Administration of the British originally failed to realize the management value of this system and abolished it with Colebrook–Comeron Reforms in 1832 but re-introduced it in 1856 with the Irrigation Ordinance No. 9 incorporating all the customs and practices ("sirith") in a codified manner making them laws, rules and regulations. These laws, rules and regulations were to apply to all irrigation systems, minor, medium and major.

1.3 Table I gives a classification of irrigation schemes with their respective sizes and features.

From the early decades of the present century the interest in the restoration and construction of major works and the complex and the sophisticated technology utilized in this task created a tendency for the technocrats to assume that the management of these "massive" schemes were beyond the capacity and comprehension of the "small farmers". As a result technocracy took over the responsibility of system management of these massive schemes as a direct function of the state. Thus over a period of five to six decades it is observed that whilst the best features of the traditional customs, laws and practices were retained in the planning, restoration, maintenance and management of minor irrigation works, there were major departures in policy, consiciously or otherwise, when it came to the planning and management of major irrigation works. Here it may be possible to classify some of the medium works with the former as they did retain the traditional character depending on the extent to which the local community was associated with the system.

1.4 There were many factors which led

Table 1: Classification of Irrigation Works

Type	Size	Features	Construction Agency
Minor	Village Iriagetion Works up to 200 Acres	– Irrigation by a single canal and served from field with no FCC – Managed by DAS and maintained by farmers – Predominantly praveni or private land. – Designed for I season-maha cultivation. – Crop invariably rice-for subsistence.	Totally constructed by proprietors Sometimes masonry works and sluices supplied free of charge by government.
Medium	200-500/1000	– Has a distribution system with FCC. – Managed and maintained by ID. – A mix of private and LDO Land – Designed for a Maha and part Yala cultivation crop. mainly rice.	Totally constructed by proprietors; Sometimes masonry works sluice and channel system supplied free of charge by government. Somtimes totally by Government.
Major	500/1000 Acres to about 25,000 Acres	– A complete distribution system with Branch Distributory and Field Channels. – Predominately LDO plus a – Limited extent of private land. – Fairly uniform holdings designed for a Maha and a substantial Yala – Rice plus other – Non-farm activities important Managed and maintained by ID.	Totally constructed by Government Irrigation rate levied for cost recovery
Major	(River Basin Schemes)	– Similar to above but most management decisions and allocations decided from a central point.	

Source: (1) Irrigation Management Division, Ministry of Lands, Irrigation and Mahawell Development.
(2) Irrigation Ordinance No. 32 of 1946 classfies the irrigation schemes into minor and major schemes. Minor works are those constructed by proportions without government and or with the aid of masonry works and sluices free of charge by government. These are locally maintained by proprietors. The The construction operation and maintenance of all major schemes is the total responsibility of the government and proprietors are required to pay rates, and they have to maintain their field channels.
(3) The Agrarian Services Act defines an irrigation work commanding les than 200 acres as a minor scheme.
(4) The Irrigation Ordinance No. 1 of 1951 defines a major irrigation work as "an irrigation work constructed and maintained by or under the authority of the Director of Irrigation with monies provided by Parliament".

to these departures. First the village systems were planned and developed for the local community invariably in consultation with them at village level and at the level of the District Agricultural Committee (Irrigation Ordinance). Second the larger systems particularly those related to settlements (whether restoration or new construction) were planned from the centre and for a set of people who due to logistical reasons could not be involved in the planning or development. (2) In addition to resources for O & M of the large schemes were grossly inadequate and there was no effective institutional arrangement for resource mobilization either.

1.5 The structure of the system itself- the size, procedure for the selection of beneficiaries and their background, physical planning and the settlement patterns and the welfare objectives of government combined to make any kind of beneficiary involvement in the major schemes difficult. While the farmers were not associated with the planning process and were unacquainted with the operation of the system their participation in maintenance and management was minimal.

1.6 Physical factors such as the design of the system, allowing individual outlets over a massive and complex distribution system, large number of small farmers involved and the remoteness of the main system and the reservoir from the beneficiaries tended to create a situation of beneficiary alienation from management. Institutional factors such as "social welfare policy" of government which accepted responsibility for O & M; the heterogeneous nature of the settler-population which made community action difficult, the inadequacy of the Kanna meeting mechanism to meet the needs of a large system and the insensitivity of the irrigation bureaucracy to the need for beneficiary-involvement aggravated this alienation process. All these factors contributed towards a weakening management system of these schemes leading to gradual deterioration and decay of most of the schemes by mid sixties.

02. The Irrigation Programme Review and Experimentation

2.1 The IPR beginning from mid sixties highlighted the weaknesses of the above situation in the major irrigation schemes and emphasized the need for improved management and rehabilitation of these schemes towards enhancing their production and productivity levels.

2.2 The spurt of thinking and experimentation beginning with "Special Proj-

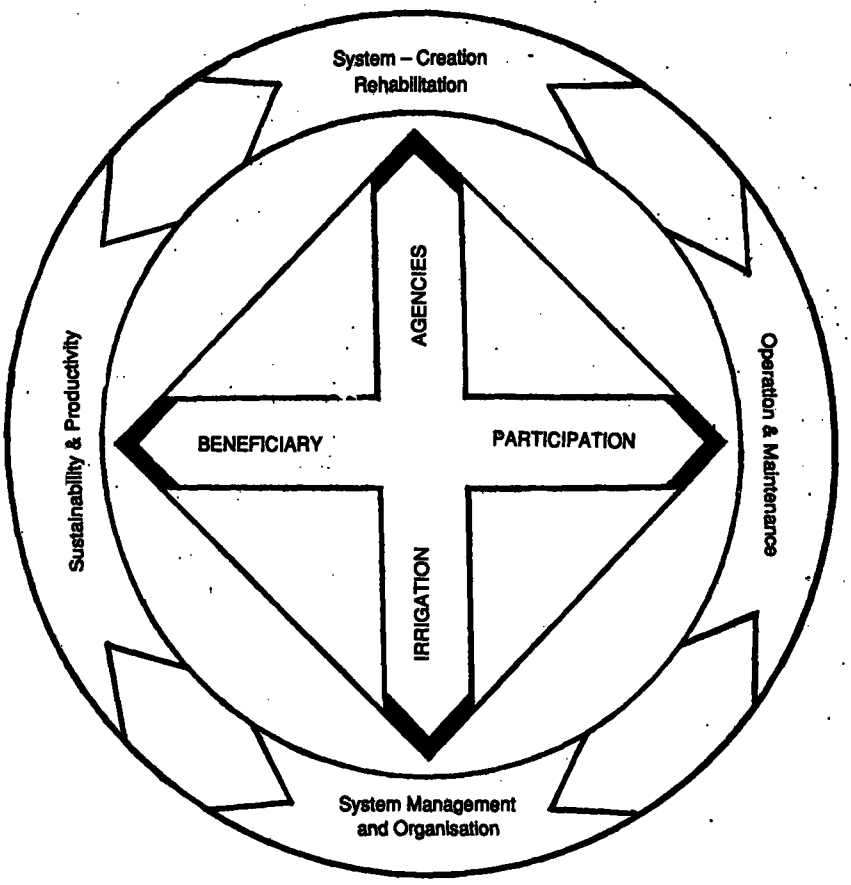
Table 2 – Recent Experiments on Irrigation Management

Name of Programme	Implementing Agency	Location	Date	Positive Lessons	Weaknesses
1. Special Projects	Ministry of Agriculture with District Admi.	Twenty Three selected major Irrigation schemes	1967-1970	Increased Yields; introduced OFC; Better communication among with services; System/Project/Programme basis;	Lack of adequate mechanism for institutional development; Non-involvement of beneficiaries; lack of machanism for better management of the resource base; centralization of all decision-making in the Project Managers.
2. Mahaweli Feasibility Proposals	Mahaweli Development Board	Mahaweli H. Area – Stage II of Project I, of Phase I	1971-1976	Attempt to involve beneficeries; system management considered important in physical planning system/project/programme approach. Promotion of collective effort concept of a specific settlement; increase production and productivity.	Accelerative resulting in undermining the positive aspects. Bureaucratization, Pampering of setlers, No leaving-process-crash approach.
3. Gal Oya Left Bank Rehabilitation and Water Management Project	Ministry of Lands & Land Development, Irrigation Department, ARTI, Cornell University	Left Bank of Gal Oya	1979-1985	Beneficiary involvement at all stages catalyst system. Appropriate system of farmer organisation; involvement of farmers in operation and maintenance, Physical Irrigation, Assisted self-reliance	Inability to retain in the catalyst. Massiveness of the scheme; diffusion of responsibility; need for continuous support.
4. Water mahagement Programme	Ministry of Lands & Land Development	Twenty five selected major Irrigation schemes	1982-1984	Project Management Systems. Benificary involvement; farmer organisation development. participation Irrigation water management Coordination among services.	Inadequate administrative authority for co-ordination confinement to water use; farmer organisation.
5. Programme for Integrated Management of Agricultural Settlement Scheme (INMAS)	Ministry of Land & Land Development, Irrigation Management Division	Thirty five major Irrigation schemes	1984 onwards	Project Management System; Benefiary involvement; farmer organisation; Assisted self-reliance; leaving process; catalysts.	Lack of legal recognitions for the system; Lack of adequate resources for some schemes; slow-moving extraneous influences.
6. Policy on Participatory Management	Ministry of Lands; Irrigation & Mahaweli Development	All Major Irrigation Schemes	1989 onwards		

Source – Irrigation Management Division of the Ministry of Lands, Irrigation and Mahaweli Development.

Fig 1

IRRIGATION MANAGEMENT CYCLE OR CONTINUUM



ect.. in the sixties; Farmer Committees aimed . participatory/self management of Mahaweli Settlements planned in the seventies; the creation of the TCEO and the land betterment tax in the early seventies; the Gal Oya experiment searching for new-management mechanisms using catalysts, farmer organisations and farmer-officer linkages in the late seventies; the co-ordinated water management, agricultural production and farmer organisation through a project management system in the early eighties, the consolidation of these experiences in the current INMAS programme from 1984 and the policy-package on participatory management the late eighties are salient land marks the search for an acceptable and sustainable managment system for the major irrigation-schemes. (Table 2).

3.3 While the search for an appropriate system-management strategy continued and ultimately came to stay with INMAS and the policy-package on participatory - management the government was rapidly increasing its welfare concession to the irrigation sector. The Accelerated Mahaweli Programme appears to have influenced this policy obviously for the government to keep to its "political egalitarianism". Therefore the government intervened in the management of irrigation schemes of all sizes with additional doses of O & M allocations thus stifling the attempt to device a mechanism of resource mobilization of O & M with beneficiary - involvement. This policy got so extended that when farmers failed to contribute their share in maintenance the state stepped into undertake **full restoration** or **major rehabilitation** of the entire systems including even the village works, where conditions were more conducive to beneficiary - involvement. With aid and assistance from donor - agencies several programmes of rehabilitation/ modernization covering minor, medium and major schemes were undertaken from 1977 onwards by different government agencies as local counterparts to the donor-effort. (Table 3).

03. The Inter-Dependent Nature of Rehabilitation and System – Management; The Twin Processes.

3.1 It is obvious that the need for rehabilitation / modernization was the decay and deterioration of the systems due to lack of adequate resources for regular maintenance over a long period. This may be due to the technical - engineering / construction – design defects, or lack of adequate budgetary allocations for O & M or the weakness of the management – organisations or a combination of any or more of these factors. If the design is inappropriate given the objectives of the system or the construction quality is low then the life of the system becomes stressed. If budgetary allocations are insufficient or if there is no effective mechanism of resource mobilization to cater to proper and timely maintenance of the system such that essential repairs are differed or partially done then it will be difficult to sustain the system at the level required for effective operation. All this contributes to a gradual deterioration and the ultimate decay of the system needing complete restoration or rehabilitation (system-creation or re-creation).

3.2 In view of the above realities the foremost objective of any rehabilitation / modernization programme is the need to recognize this reality and gear the programme towards remedying the draw backs of this situation. For this it is very important to realize that rehabilitation / modernization and system-management including O & M are, in fact the twin-processes of one single "continuum" or "cycle" in any irrigation management strategy. The two processes affect each other in a causal-effect cyclical relationship highlighting the need for a great deal of close interaction between the main protagonists of the irrigation drama the system – creators (irrigation bureaucracy) and the system utilizers. (beneficiaries) Fig I.

3.3 In view of this it is important to exploit the rehabilitation / modernization opportunity to implement an effective management – system in addition to

purely physical changes. Improvements and changes to physical structures could be designed with considerations of reduction of costs on O & M. At the pre-rehabilitation, during-rehabilitation as well as the post-rehabilitation stages irrigation systems have both a physical apparatus and a set of social (institutional) arrangements for using or utilizing that apparatus. If full benefit is to be obtained from the heavy investment in the physical system the social arrangements for managing the scheme must be effective.

04. Rehabilitation, System-management and Sustainability

4.1 The evaluation of rehabilitation projects is fraught with numerous difficulties and requires a long time-frame. It is of course obvious that the criteria by which they have to be evaluated depend on many factors specific to the system and to the country. Generally the objectives of a rehabilitation project should include the optimising of productivity, profitability and equity because the very process of rehabilitation is undertaken as productivity and profitability levels are very low and equity in water distribution cannot be ensured as the canals and structures do not operate at the required levels. It is true that after rehabilitation the productivity and profitability levels may go up and a fair degree of equity too can be ensured; but this may be only for two or three seasons or two or three years-short-lived. Therefore the most important criterion of the efficiency of a rehabilitation effort should be its "sustainability" over a considerable period of time. "Sustainability" in turn is dependent on the management - organisation for operation and mainte-

Table 3 – Restoration/Rehabilitation Efforts since Mid-Sixties

Name of the Project	Implementing Agency	Funding Agency	Location	Dates	Strategies
(1) Tank Irrigation Modernization Project (TIMP)	Irrigation Department Department of Agriculture	World Bank (IDA) Govt. of U. K.	Padaviya Mahakandarava Mahawilachchiya Pavtkulam Tavunikulam	1977 to 1983	(i) Increase agricultural productivity through intensification of land use and increase crop yields by adopting better water-management and agricultural innovations (ii) Equitable water-distribution
(2) Village Irrigation Rehabilitation Project (VIRP)	Dept. of Agrarian Services and Irrigation Department	World Bank (DA)	1200/village tanks in 14 districts	1981 to 1989	(i) Physical rehabilitation of deteriorated minor schemes to increase agricultural production and farm-incomes (II) Systematic water Management to ensure efficient utilisation of stored water. (iii) The Strengthening of major implementing agencies of government particularly the dept. of Agrarian Services.
(3) Major Irrigation Rehabilitation Project (MIRP)	Irrigation Management Division of KLIMD, Irrigation Dept. Dpat of Agriculture, Land Commissioner's Dept. Dept. of Agrarian Services	World Bank (IDA), (CIDA) & (SDC)	Kantale Korawewa Iranamadu Giant's Tank Rajangana Kachchaduwa Huruluwewa	1985 to 1990	(i) The rehabilitation of the systems for optimum utilization of available water. (ii) The introduction of and support for, water management programmes and the complementory programming of agricultural activities and inputs (iii) Support for the main government agencies involved in physical rehabilitation, operation and maintenance and irrigation management. (iv) Farmer Organisations and farmer-participation in Scheme management . (This is as a means of achiving above)
(4) Gal Oya left Bank Rehabilitation and Water Management Project (GOLB)	Irrigation Dept. (ARTI), Cornell University)	USAID	Gal Oya left Bank	1973 to 1985	(i) Rehabilitation of the physical systems (ii) On- farm management improvement (iii) Assist in the establishment of farmer organisations in the construction, operation and maintenance of the system. (iv) Improvement of the Central support provided by the Irrigation Department. (v) Develop. procedures and techniques to be replicated throughout Sri Lanka.
(5) Walawe Irrigation Rehabilitation and Improvements Project. (VIIP)	Mahaweli Economic Agency	Asian Dev. Bank	Walawe Special Area	1985 to 1989	Physical Rehabilitation Other Objectives not explicit.
(6) Irrigation Systems Management Project	Irrigation Management Division of Ministry of Lands, Irrigation & Mahaweli Development and Irrigation Department Dept. of Agriculture	USAID	Parakrama Samudara Giritale Minneriya Kaudulla Gal Oya L.B. Gal Oya R. B. Less intensive studies in selected other systems-(Ridi Bendi Ela)	1986 to 1991	(i) Physical Rehabilitation (with cost effective considerations!) (ii) Farmer Organisation Development (iii) Improvement of Operation & Mainténance (iv) Financial Management (v) Monitoring, Evaluation and Feed-Back (vi) Training Capacity Enhancement
*(7) The Small Tank Rehabilitation Project (NFFHC)	National Freedom From Hunger Capaign Ministry of Agriculture	NFFHC	Neglected and abandoned village Tanks in the Dry Zone.	1979 onwards	(i) Improvement of the quality of life (ii) Restoration of the village tank and revival of the village community (iii) Assisted self-reliance (iv) Benificiary – participation.

Source – Irrigation Management Division of the Ministry of Lands. Irrigation and Mahaweli Development

* This is not included in the comparative Analysis referred to in Para 7.13

nance of the system as a integrated on-going or continuous process.

4.2 "Sustainability" is linked to the life-span of a project. The life-span of irrigation projects considered as economic enterprises is usually calculated only in terms of economic considerations which are intimately connected to a relative depreciation of investments made for the project. But the irrigation schemes in Sri Lanka (and perhaps all over the world) are both social and political systems and the social and political bearings of these systems extend far beyond what the economic considerations can project. In this regard the life-span of irrigation systems has to be linked to ways and means (the social arrangements) of tendering them to exact a "sustainable" productivity, profitability and equity. The prevention and the arresting of decay and deterioration certainly results in better yields and many doses of investments on ad-hoc reconstruction, structural improvements and cyclical rehabilitation. There is not much of a purpose in restoring or rehabilitating a system if the results of restoration / rehabilitation cannot be sustained on a long-term basis.

4.3 What are the factors that bring about or equip an irrigation rehabilitation programme with sustainability. In terms of specific reference to Sri Lanka's irrigation systems three possible factors can be identified as contributing towards sustainability.

(i) **An effective** harmonization of the objectives of system - creation (physical apparatus) with the methodologies and procedures of system - utilization (social arrangements for management);

(ii) **An effective** mechanism of mobilization of adequate resources for operation and maintenance;

(iii) **An effective** system management organisation.

4.4 It would be seen that these factors are mutually inter-dependent. The third factor for example is the principal determinant of the first and the second. Without an effective system - management organization (with beneficiary - participation) it is extremely difficult to mobilize adequate resources for O & M and also nearly impossible to involve system-utilizers in the physical planning process of the scheme. On the other hand, an effecitve harmonization of the objectives of system-creation with the methodologies and procedures of system-utilization helps in the mobilization of resources for O & M including beneficiary-contributions and also enhance and encourages the building of an effective system-management organization. These requirements therefore become mutually supportive/complementary/ supplementary to each other in a cyclical fashion as indicated in Fig 1.

05. The Need for an Effective Harmonization (Synthesis) between System Creation and System Utilization.

5.1 The process of restoration/ rehabilitation as it has been practiced during the last three decades in Asia and particularly in Sri Lanka since independence covers a broad spectrum of activities such as programmes to restore systems to their original design-state, to expand systems to irrigate additional areas and modernization of systems to achieve certain fundamental objectives not thought of at the time of construction or "system creation". It is implied in this definition that certain fundamental objectives were not considered at the time of construction – "system-creation". These "ommitted/missed/forgotten" objectives became the key debating points in the Social Sciences which attempted to evaluate the restoration / rehabilitation exercises as well as other irrigation management strategies undertaken from mid-sixties in Sri Lanka. (Table 2 & 3) These debates have revealed that the "omitted / missed/ forgotten" objectives relate mostly to management aspects of the major Irrigation Schemes.

5.2 After the ancient irrigation management system broke down with the British Administration it was with the Mahaweli that proper management became an important guide in irrigation system-design. (3) The major irrigation schemes constructed or restored before the 1970s were invariably designed for a Maha Season cultivation only with channels designed for a continuous flow which posed no problem during the wet season. But extracting a Yala Season cultivation (productivity and profitability) even from a fraction of the irrigable command was therefore a difficult proposition which was aggravated by the absence of any social institutional mechanisms for collective action in these schemes. It was only in the Mahaweli and the projects that followed that two – season cultivation was conseciously planned, canals designed specifically for rotational water distribution. In the GOLB rehabilitation programme there was a conscious attempt to involve beneficiaries in decision-making on designs and construction during physical rehabilitation and continuing during the operation and maintenance of the system. (4)

5.3 In the small Wew-Sabha Schemes of the NFFHC community participation at all stages of the rehabilitation process is reportedly very high. In fact this strategy is entirely similar to the system mentioned by H. W. Cordrington (5). The initative in the identification of an abandoned or breached tank for rehabilitation or an existing tank for improvement comes from the interested village community. The NFFHC helps with guidance, technical investigation and information. The Wew Sabha had its own maintenance fund. The NFFHC also contributed supplemented funds. To overcome the possibility of delay in construction and over-dependence on the bureaucracy and to make technical skills available within the community itself the NFFHC selected educated unemployed youth and arranged for their technical training. Even certain survey instruments were modified and adopted so that they could be used by the village youths, laying the ground work for local-self-reliance and project sustainability.(6)

5.4 In the INMAS Projects (including MIRP & ISMP) successful attempts have been made to involve system-utilizers in the process of rehabilitation planning as well as construction activities. Though a hierachical structure of Farmer Organisations and a system of Project Management Committees consultation is ensured at every level on all aspects of the projects. All construction, rehabilitation improvements and maintenance

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works are programmed and the priority fixed in consultation with the Project Management Committee and the Farmer Organisations. The Farmer Organizations are made aware of the physical work that is proposed to be done and also of all the financial allocations which the scheme would be getting from all sources of funding. (7) All these works are entrusted to the Farmer Organisation subject to the limitations laid down by the Treasury. (8) The Farmer Organisations are actively encouraged to take part in the selection process, fixing up priorities and the rehabilitation work so that ultimately the farmers would feel the ownership for the irrigation systems.

5.5 Several attempts have been made to redesign structures and canals for rotational issue of water as well as to allow diversification. In most projects the farmer organizations are able to manage water economically, equitably and timely so that a third cultivation could be planned in between Maha and Yala (ISMP Ridi Bendi Ela) thus emphasizing the productivity and profitability objectives of rehabilitation. In fact production planning and implementation has received concerted attention in these projects from 1989/90 Maha season onwards.

5.6 In the TIMP on the other hand there was a heavy bias towards construction and engineering aspects and the poor design for farmer involvement resulted in the bureaucratization and eventual failure of irrigation Management. Two of the schemes that were taken up for rehabilitation Padaviya and Mahakanadarawa were highly water – stressed schemes. and should not have been rehabilitated without the tacit consent and agreement of the farmers. It is now known that at least in these two schemes the rehabilitation has served very little purpose as there had been no proper cultivation after the programme. The civil works under TIMP accounted for about 70% of the total cost. Despite this heavy cost structural changes introduced by the TIMP led to major physical problems such as faulty location of farm turn-outs, incorrect levels of some lined tertiary and secondary channels etc. Apart from these defaults the changes were not acceptable to the beneficiaries becuase there was no mechanism of beneficiary- involvement. Innovations proposed were not taken seriously by the farmers. In short the heavy investment on engineering aspects, the direct intervention of the irrigation bureaucracy right down to the field turn-out level, (which was not possible) inability to grasp farmer-circumstances and the absence of any mechanism to involve farmers all contributed to the Project having had little or no significant influence in the long run development of the settlers' economy (9) Now it is widely accepted that TIMP is not a success story in rehabilitation and improving major irrigation-system in the country. (10)

5.6 In the VIRP (Moneragala) Project there was little or no participation of the beneficiaries either in designing or construction of the rehabilitation programme. In fact what was left of farmer-management soon evaporated once the state sponsored rehabilitation work commenced. It is regrettable to note that the VIRP with its Agriculture Planning Team stifled the self-reliant approaches demonstrated by the respective village communities in irrigation system-management. Shyamala Abeyratne summarizes the "criminal assault" launched by the VIRP on the village irrigation systems and signals a warning of a possible dangerous impediment in the operation and management of these schemes in the future.(11)

06. Resource Mobilization for O & M

6.1 In the absence of a proper mechanism of harmonizing the objectives of system creation and the procedure of system – utilization, it would be nearly impossible to ensure a proper arrangement for operation and maintenance of any irrigation work. In the case of village works, the beneficiaries undertook the operation & maintenance of their works because they felt that the irrigation system was theirs' and not the agency's. But in regard to Major Irrigation Schemes, in the area of operation & maintenance and water distribution, certain technical compulsions make beneficiary - involvement extremely difficult. The O & M of head works can be handled only by trained professionals. The O & M of the main system atleast upto the distributory channels requires the services of many paid and regular employees. Management of field channels and below which has to be attended to by the farmers is possible only if the main system functions at optimum level. The O & M of major schemes is therefore a very costly affair.

6.2 The history of irrigation administration in Sri Lanka indicates that the Government has been continuously conscious of this fact. Nevertheless most attempts of Government, on resource-mobilization have atleast partially, if not totally failed due to various reasons. The system of irrigation rates during the Colonial Administration related to both construction and maintenance. (Irrigation Ordinance of 1935). It was a kind of cost-sharing between the Government. and the beneficiaries. Due to certain implementation difficulties this system gradually failed and became a forgotten thing by early fifties. However it remained valid in the irrigation law until the early 1970's when the irrigation rate was abolished and the "Land Betterment" tax was decided upon, but this became a dead-letter. In 1984 the Government decided to collect an O & M fee in lieu of the services provided by the Government to the farmers by way of irrigation facilities. Although the collection was fairly satisfactory during the first year (1985) it fell to very low levels during the following years and came to more or less a stand still by 1988. (13)

6.3 Most rehabilitation and management projects (Table 2 & 3) except GOLB and later INMAS do not seem to have considered the importance of this aspect at all. This aspect seems to have been just taken for granted and allowed to be taken care of by itself. For example; in the VIRP, the O & M functions were expected to become the responsibility of the farmers with the support of the Department of Agrarian Services. However, the ID was responsible for ensuring satisfactory functioning of the headworks and structures rehabilitated under the project for a period of two years. But the system did not work as Agriculture Planning Team (and Tank Committee) was used as the basic mechanism for ensuring post-rehabilita-

tion system operation and maintenance. The AR & TI study has pointed out that the farmers participated on a shramadana basis in operation and maintenance only under compulsory fiat. There was no special commitment by farmers. In the TIMP there was not even a semblance of an attempt to ensure operation and maintenance after rehabilitation.

6.4 In the NFFHC Wew-Sabha System, the Wew-Sabha members are expected to repair and maintain the tank and its irrigation system at all times. This is done by using funds from the "Wew Maintenance Fund" or by using "shramadana". Every member mede a contribution to this fund. There are instances where the Wew-Sabha has met at dead of night to decide on the course of action to be taken to save the bund after heavy flood. The same arrangements are found in the INMAS Projects including GOLB, MIRP & ISMP as well. The resource mobilization for O & M under these projects take the form of;

(i) 'Shramadana' by the farmers on their own:

(ii) "Shramadana' with Technical Officers (on the job training of operation & maintenance) and

(iii) Undertaking the operation and maintenance of the distributory systems on payment of a nominal sum by government. (Policy on Participatory Management)

In addition many Farmer Organisations in these two projects have commenced building up their own funds through either contributions from farmer members or by collecting fines from farmers in lieu of failure to attend to their share of maintenance. In fact, the GOLB provided the basic guidelines for all these arrangements.

07. The Importance of an Effective System-Management Organisation

7.1 Irrigation management is the process by which the performance of the irrigated agricultural sector (or the agricultural sector based on irrigation) is enhanced on a sustainable basis through a system/programme/project approach for the development of community, society and the country at large. It must deal with physical. technical, agricultural, institutional, political and soci-ecnonomic considerations simultaneously as an on-going integrated process. The need for this to be an on-going integrated process arises from the very nature and characteristics of irrigaiton as a utility infrastructrue in the whole development effort.

7.2 In many cases it is noted that the irrigation systems need rehabilitation precisely as a result of management weaknesses at the agency level, the farmer-level or both. Therefore one of the important objectives of system rehabilitation should be the consideration of the capabilities and characteristics of the management-agency implementing the projects, the appropriate roles of the system-creators and the system-utilisers during and after rehabilitation and the most desirable relationship between them.

7.3 What are the fundamental principles and organizational requirements of an effective irrigation system management strategy? In view of the inter-dependent nature and the multi-faceted character of irrigation these principles and requirements can be identified as follows:

Fundamental Principles:

(i) The inter-disciplinary / multi-disciplinary/ integrated approach;

(ii) The co-ordinate effort;

(iii) The "Team Spirit";

(iv) The competence to generate and generalize change (catalyst); social & legal sanction for these changes;

(v) Flexibility, (location and community specific organizational structures);

(vi) Provision for beneficiary - involvement at all stages;

(vii) Effective mechanism for resource mobilization;

(viii) Combination of "top-down" and "Bottom-up" approaches;

(ix) Assisted self-reliance;

(x) Training to develop professional skills as well as managerial capacities.

Organisatinal Requirements:

(i) The establishment of adequate governmental supportive services to the farmer, his family, and his community;

(ii) The establishment of adequate mechanisms at the local community level through which farmers and their families can clarify their needs, make their wishes and aspiratin known to government (irrigation) planners; mobilize local support for agreed irrigation development / rehabilitation plans and objectives and participate in the effort;

(iii) The establishment of effective linkages between the above two sectors.

7.4 When the large mass of water in the Senanayake Samudra (galoya) has to be split into a multitude of 3 – 2 1/2 acre parcels, a number of intricate problems:– technical, engineering, economic, social, administrative, political etc. do arise and have to be addressed as integral components of a single inter-dependent package. This package contains problems relating to hardware of irrigation such as reservoirs, head-works, canals, gates, regulators etc. as well as problems concerning soft-ware of social / institutional / organizational considerations. Any attempt to 'compartmentalize' or 'departmentalize' this inter-twined single package into isolated departmental responsibilities results not only in a great deal of confusion and chaos but also in inefficient use of resources very often leading to waste and very low yields at vey high costs.

7.5 An inter-disciplinary or integrated-approach on the part of all government agencies is therefore absolutely essential. The 'Special Projects' system made an attempt to look at these schemes as projects, and brought about a better coordination in the services. But it did not sustain due to the lack of an adequate institutional programme and the non-involvement of farmers in the man

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agement. In 1971/72 the Mahaweli Feasibility Proposals successfully dealt with the problem of coordination with the establishement of a Sub Area Team consisting of an Irrigation Officer, Agricultural Officer and a Community Development Officer working under the same roof. (14) The GOLB in 1979 established a Project Committee system as a mechanism of coordination. This was later copied in the Water Management Programme and consolidated in the INMAS as Project management Committees and sub-committees. In the NFFHC the Wew-Sabha system promoted coordination of activities and services at all levels. The APT and the TC system in the VIRP and TIMP, became a total failure in this regard.

7.6 It is now widely recognized that any irrigation system management mechanism to be sustainable and effective, should incorporate beneficiary - participation and involvement at evey stage from system-creation (construction or rehabilitation) to system-utili (production). The absence of such a mechanism adversely affected resource mobilization for O & M of the schemes. The principle of "no taxation without participation" seems to have been very effective throughout the modern history of Major Irrigation Schemes in Sri Lanka. The primary reason for this is the failure to involve the system-utilisers in the decision making process and to make them feel part of the system and accept the system as theirs'.

7.7 It is seen tha most of the rehabilitaiton projects at least in their feasibility stage have accepted beneficiary-participation in principle. The contention however, is that there may be no effort to promote and develop this as a part of the rehabilitation exercise. (Table 3) The organisation of farmers, the restructuring of line agencies of Government and the establishment of an effective linkage between these two and more generally "institutional building" is often added as an after-thought after the rehabilitation effort has proceeded quite far (VIRP & TIMP). Even where this has been recognized the responsibilities to be entrusted to the Farmer Organisations are defined narrowly such as to do field level construction free of charge and to do maintenance after the project is finished or to confine to water management. (initially in the INMAS Schemes including MIRP & ISMP)

7.8 It is very important that "institutional-building" should be considered as an integral component of the rehabilitation process. Farmer Organisations should be considered not in isolation (per-se) but should be viewed in the context of the management arrangements to be implemented throughout the system. The TIMP design for farmer involvement has been rated very poor and this resulted in the bureaucratization and eventual failure of irrigation management. On the other hand in Gal-Oya there was a conscious attempt to involved beneficiaries right from the beginning in the decision-making on designs and construction during physical rehabilitation and continuing during the O & M of the system. In fact GOLB offered a "learning process" approach to building farmer organisations in major irrigation schemes. "Institutional Building" and participation of beneficiaries through farmer organisations is an integral component in the INMAS including MIRP & ISMP Projects.

7.9 It was noted earlier that due to certain historical, technical, structural and social reasons beneficiary- involvement is nearly impossible in the situation of "Colonization Schemes" in Sri Lanka. The inclination and inducement for collective effort, self-reliance and social-interaction do not emerge automatically in the social structure of the colonization schemes as they do in the traditional village communities. Therefore it is necessary to introduce some form of organizational set-up with catalysing and inducement from outside. Such organizations should be loosely structured multipurpose organisations. They should preferably be established on a hydrological basis; the members must jointly share and control a single water source such as a field channel or a distributory at a higher level. The organization should be able to attend to all the aspects of farming such as economic aspects, production aspects as

TABLE 4 - Comparative Analysis of six Rehabilitation Projects

Project Component	No Participation Score = 0	Minimal Participation Score = 1	Institution Building Score = 2
Project Objectives	VIRP VIMP WIIP	GOLB MIRP	ISMP
Planning Progress	VIRP TIMP MIRP GOLB WIIP	ISMP	
Design Process	TIMP WIIP (0.5)	VIRP	MIRP GOLB
Construction Process	WIIP	TIMP MIRP VIRP GOLB (1:5)	ISMP
Organizing Farmers Groups		TIMP VIRP WIIP	MIRP GOLB ISMP
Bureaucratic Rorientation	WIIP TIMP MIRP VIRP	GOLB	ISMP
Cost Recovery	VIRP	TIMP MIRP GOLB WIIP ISMP (1.5)	

Source- Farmer Organizations and Irrigation System Rehabilitation Projects in Sri Lanka: An Analytical Framework By - D. J. Merrey - International Irrigation Management Institute Paper prepared for presentation at the Irrigation Design for Management Asian Regional symposium, at the International Irrigation Management Institute, Digana Village, Sri Lanka, 16-18 February, 1987.

well as community welfare aspects. Most of the Farmer Organizations in the INMAS projects are now developed on this basis and have taken over distributory systems for O & M and extended their scope of activities beyond water management to production planning and implementation including provision of inputs and facilites for marketing of farm products, and even to socio-cultural activities such as the establishment of libraries and reading rooms, redemption of mortgages, the establishment of women and youth clubs etc. Similar programmes are undertaken in the NFFHC projects as well.

7.10 The lack of an effective linkage between the governmental organizations and the beneficiaries or more correctly, the differentiation between system-creation (construction) and system utilization or management; between physical planning and production planning certainly results in the gradual deterioration and decay of the irrigation schemes. This leads to an ever-lasting conflict situation between irrigation bureaucracy vs. peasantry; controllers vs. users and system-creators vs. system utilisers. This phenomenon has been disfiguring the irrigation scene of Sri Lanka over a long period since independence in 1948 up until recent attempts at a fair reconciliation between system-creation and system utilization or managment which culminated with the INMAS.

7.11 In major irrigation schemes if both farmer s and government officials are to take part in the rehabilitation and system-management activities it is mandatory that amicable relationships are developed between the two groups whichare characterized by mutual-trust, unerstanding and respect. Changes in attitudes cannot be achieved in isolation from each other, but only through situations which permit mutually profitable interaction. In this regards too it is only an "outsider" (catalyst) who could play a meaningful role. In the INMAS (including GOLB, MIRP and ISMP) three categories of catalysts are being employed for this purpose? the 100 Govt. Officials in the schemes and para-professionals selected from among the farmers and trained to work on a voluntary basis. In the INMAS Projects the system of farmer-organisations originating from the grass-roots level of the field channel and leading hierarchically through the D'channel Farmer Organisations to a Project Management Committee is designed to ensure both beneficiary – participation and a joint-effort by system creators and system- utilisers. The policy on participatory management provided additional impetus to the INMAS from 1989 onwards.

7.12 This paper provides no space to go in for a lengthy evaluation of the INMAS Programmes. Nevertheless it is important to note that it offers a reflective profile of a substantially feasible and viable irrigation system-management strategy. It also affords the opportunity of re-discovering the past heritage of irrigation management in Sri Lanka; the system of participatory-management, a system that can be adopted to all schemes irrespective of their size (minor, medium, major) with appropriate modifications and structural adjustment. In this regard it is psychologically, emotionally and socially close to the Sri Lanka heart and soul and therfore is easily acceptable to Sri Lankan farmer.

7.13 At this stage it is useful to look at a Comparative Analysis of six rehabilitation projects (Table 5) made by Douglas J. Merrey of the International Irrigation Management Institute. He came out with an "Analytical Framework" for comparing rehabilitation projects based on a scoring system for each of the components of project objectives, project planning-process, project design-process, organizing farmer groups, bureaucratic re-orientation and cost recovery. (Table 4 & 5 are directly copied from Merrey's presentation). In terms of this scoring system the ISMP has gained the highest score and the GOLB the next highest. The MIRP is placed third. Although the MIRP and ISMP had not made much headway at the time of Merrey's analysis, his expectations have all been realities by now and particularly the ISMP is still far ahead in the scoring system. The WIIP too after restructuring since Merrey's analysis now should move up on the scale of scoring. (GOLB, MIRP & ISMP all come under the umbrella of the INMAS).

7.14 It is clear that the seven components identified by Merrey as criteria for classification of rehabilitation projects are more or less the same as those identified in this paper as essential ingredients for the success fo any irrigation effort and the factors that bring about sustainability to such an effort. He is also emphatic that beneficiary-participation is absolutely essential to "sustain" the benefits of a rehabilitation project. Merrey concludes "... if sustainability of rehabilitation project benefits is a key objective then it is extremely important to plan projects with specific institution building objectives, and with a proje

Contd on page 6

Table 5 – Rehabilitation Projects Scores

Project	Score
ISMP	12.5
GOLB	8.5
MIRP	7.0
TIMP	3.0
VIRP	3.0
WIIP	2.5

Note – Based on Table 4. The range of possible scores is 0-14

Source – Farmer Organizations and Irrigation System Rehabilitation Projects in Sri Lanka: An Analytical Framework.
By – D. J. Merrey – International Irrigation Management Institute Paper prepared for presentation at the Irrigation Design for Management Asian Regional Symposium, at the International Irrigation Management Institute, Digana Village, Sri Lanka, 16-18 February, 1987.

List of Acronyms

1. Agrarian Research and Training Institute	- (Ar & TI)
2. Gal Oya Left Bank Project	- (GOLB)
3. International Irrigation Management Institute	- (IIMI)
4. Integrated Management of Agricultural Settlements	- (INMAS)
5. Institutional Organiser	- (IO)
6. Irrigation Programme Review	- (IPR)
7. Irrigation Systems Management Project	- (ISMP)
8. Major Irrigation Rehabilitation Project	- (MIRP)
9. National Freedom From Hunger Campaign	- (NFFHC)
10. Operation and Maintenance	- (O & M)
11. Territorial Civil Engineering Organisation	- (TCEO)
12. Tank Irrigation Modernization Project	- (TIMP)
13. Village Irrigation Rehabilitation Project	- (VIRP)
14. Walawe Irrigation Improvements Project	- (WIIP)

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strategy that specifically contributes to achieving these objectives, rather, than treating institution building as, at best, an appendange to the construction component of the project. This would involve getting away from conceiving of rehabilitation projects as primarily construction projects, with their design and construction-oriented objectives and timetables, and substituting a concept of rehabilitation projects as primarily institution building exercises in which the construction component contributes to improving manageability, and provides a context for reorienting and building strong and responsive social arrangements for system management and sustainability." (15)

That this is harmonization of the objectives of system-creation (rehabilitation) with the methodologies and procedures of system-utilization (management), there is absolutely no doubt.

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I The Author is personally aware of this factor. He served as Govt. Agent of the Ampara District where the GOLB Project was inaugurated and was closely associated with it from 1980 - 85 - Minutes of the Rehabilitation Coordinating Meetings chaired by the author; ARTI documentation.

Same as (01) above.

The Author's personal knowledge and experience in assisting the NFFHC Programme in the Trincomalee District during 1986 - 1989. Confirms this view, under this Programme despite the terrorist attacks most of the village communities who were fostered by this programme continued to stick to their villages although with intermittent disruptions to the programme. A total of 33 village tanks were restored in the Trincomalee District during 1979 - 86 despite the turbulent situation.

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The Author's personal knowledge - The Author was associated with the Mahaweli Project from 19970 - 1977 as a member of the Feasibility Study Team. The Author's specific assignments were Settlement Planning and Development, Marketing and Credit and the Organisation for Operation and Management of the Project.

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