

REVIEW OF PARTICIPATORY ACTION RESEARCH (PAR) IN KIRINDI OYA PROJECT WITH SPECIAL REFERENCE TO INSTITUTIONAL CHANGES

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1. Introduction

Research on Irrigation management and crop diversification has been conducted in the Kirindi Oya and Uda Walawe Projects since 1987. Even before the commencement of the Asian Development Bank (ADB) assisted formal research program, the International Irrigation Management Institute (IIMI) was involved in research work in certain specific subject areas related to irrigation management in these projects. The ADB research Program (ADB T.A.846 SRI and T.A.1480 SRI) was implemented in Kirindi Oya in two Phases, Phase 1 and Phase 11.

1.1. The Phase 1 Study

The main objective of this program was to address priority issues of importance and relevance to the two Projects in the process of irrigation system management paying particular attention to issues related to crop diversification through field research (IIMI 1990a).

The research areas intensively studied under this program were:

- planning and macro-level issues in the Kirindi Oya Project,
- irrigation institutions in Kirindi Oya,
- design-management interactions,
- irrigation system performance, and
- rice and non-rice crop production in Kirindi Oya (IIMI 1990a).

These activities were carried out by a group of IIMI research staff based in the Project area under the guidance of the international staff of the Institute based in Head quarters. The Project level Study Coordinating Committee (SCC) was used as the forum for discussion on activities in the Project and the Study Advisory Committee (SAC), whose meetings were held in Colombo, functioned as the overall management body. The findings of this research in the spheres of management, institutional issues, cropping patterns and design management interactions, and issues related to the line agencies with regard to specific research areas have been clearly documented for necessary action (IIMI 1990b).

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1.2. Phase 11 Study

Based on the findings and the recommendations of the Phase 1 study, it was felt both by the researchers and the implementors that the implementation of the recommendations was absolutely necessary to realize Project objectives. The donor (ADB) was of the strong opinion that the realization of Project objectives was not unrealistic if certain management, social and technical innovations could be introduced. After serious thinking, the implementing agencies, the IIMI and the ADB decided to extend the research activities in another Phase with the view to introducing a series of innovations to improve the overall performance of this heavily invested in Project.

Unlike under Phase 1, Phase 11 studies were carried out with the comprehensive participation of the agency staff. The preparation of the Inception Report, the implementation of research activities, the provision of training for research participants, the preparation of seasonal reports, etc. were all carried out with the active participation of the agency staff. In the case of the Phase 1 study, the IIMI staff exclusively conducted the research and the resulting Reports were then discussed with Project and Head quarters staff before finalization. With Participatory Action Research (PAR) though the internalization of the research activities, or the innovation, was found to be very much in-built and hence very little effort was needed to internalize them.

This paper intends to discuss the PAR approach in the Kirindi Oya Project with special reference to the organizational changes required to improve performance. The following paragraphs illustrate the activities carried out, describes implementation strategies and structures, discusses the impacts of the formation of research committees and examines results and lessons learned. The final section deals with the drawbacks and constrains experienced in this program.

2. A BRIEF DESCRIPTION OF RESEARCH ACTIVITIES

The Irrigation Management and Crop Diversification Research Program consists of two major components. They are:

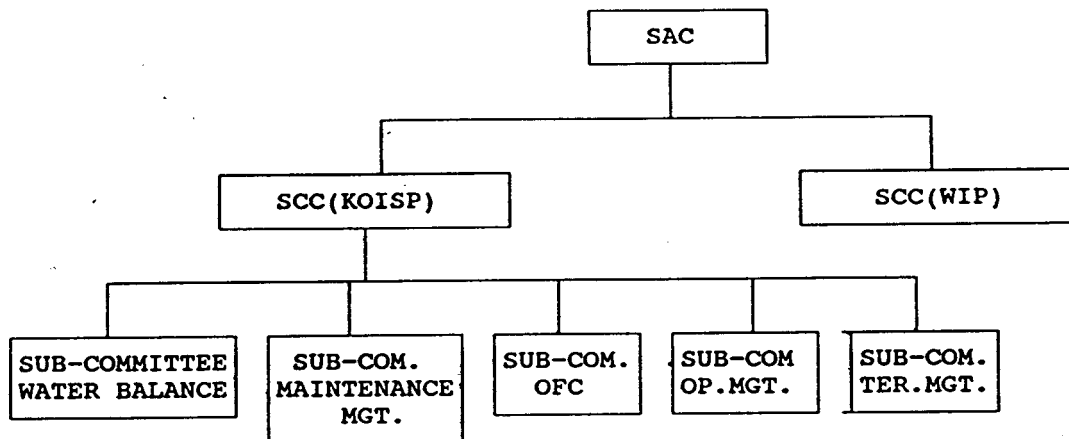
- * Main system management; and
- * Tertiary system management.

The main system management component comprised main canal operation management, water balance in the Ellegala Irrigation System (EIS), cultivation planning in the KOISP and maintenance management. A series of activities were carried out under the tertiary system management component which related to input coordination and the operation and maintenance of the system below the Main Canal offtake. In addition, a pilot project to test the feasibility of other field crops (OFCs) was carried out to evaluate the performance of OFCs during both the wet and the dry seasons.

3. IMPLEMENTATION STRATEGY AND RESEARCH MANAGEMENT STRUCTURE

3.1. Structure of Research Management

In general, the Phase II study followed the same management structure as the Phase I study except for the formation of the Study Sub-Committees at the Project level on the basis of the sub-components of the main activities. The structure is as follows:



Study Advisory Committee (SAC): This Committee is chaired by the Director of the Irrigation Management Division. Participants include Heads of Agencies or their representatives, ADB representatives, Project level senior managers and IIMI international staff members and senior researchers. Generally, this Committee meets once every six months to discuss the progress of the research work and take decisions in support of the research activities. All the presentations were done by IIMI staff members.

Study Coordinating Committee (SCC): This Committee is headed by a system level Head of Agency and its members are selected from the active participants of related line agencies. In addition to IIMI international staff, a few senior officers from the different line agencies attend these meetings which are held once every two months at the Project level. More detailed technical analysis and related research management issues are discussed at this forum. The IIMI field researchers play a key role with active contributions from Sub-Committee Chairmen. In addition, this meeting is used for the purpose of disseminating the findings of the research sub-components among the members. It also provides a opportunity for interdisciplinary interactions which contributes to improve the research activities. Most often, presentations are made by agency staff members.

Study Sub-Committee: This Committee is a new addition to the Phase I structure. During the initial stages the IIMI staff felt that the active participation of and a genuine commitment from the agency was required in a Participatory Action type of research. This Committee functions

as the grassroots level planning and implementation body of each sub-component of the research. Most of the Chairpersons of these Sub-Committees are leading persons involved in the day-to-day activities of the respective division. These Sub-Committees meet as often as required. It is rather informal in nature.

3.2. Strategy Used in Research Activities

With the help of the Terms of Reference (TOR) and the use of the Memorandum of Understanding (MOU) with the ADB, the IIMI research staff identified the research activities to cover the whole spectrum of the management activities. The recommendations submitted after the Phase 1 study have also formed the basis for the design of the Phase II research after a fair amount of homework had been done by the IIMI staff (particularly the field staff), a most effective and productive list of innovations were proposed to the relevant agency officials. The IIMI research team comprised of a social scientist, an agricultural engineer, an irrigation engineer and an agricultural economist (not at the beginning). Under the able guidance of the international staff, (a social scientist, an engineer and an agronomist) the field staff of IIMI initiated dialogues with the respective agency officials. These discussions went on for a substantially longer period of time than had been anticipated (about 3 weeks) in view of the enormous amount of work involved in formulating the draft proposals for the research. The response from agency staff on certain concepts indicated that the proposals were not fully acceptable to them. They questioned some of the innovations as not being practicable and acceptable to them and the beneficiary farmers. Nevertheless the IIMI staff (both national and international) went on promoting the newly developed concepts in private and public discussions. It was also proposed to write short notes on various selected innovations. At the start, IIMI field staff (except for the OFC program which was drafted by international staff) prepared the initial Reports on subjects such as Water Balance, Operation Management, Maintenance Management and Tertiary Management. These reports were written exclusively by the IIMI researchers but they were designated joint papers with relevant agency staff members. Quite often, more interested persons (rather few) particularly from the Irrigation Department corrected and amended these Reports. It is worth noting that their contributions and suggestions improved the IIMI staff Reports. Also, by getting them to participate this way, it became somewhat easier to motivate them to become involved in the research activities. After the first few months, the program gathered momentum and generated a reasonably sufficient interest among the officers to implement it. In some cases, an analysis of certain management activities was done and reported on, with the view to highlighting drawbacks as well as potentials for further improvement.

3.3. Preparation of Inception Report

The ideas generated by the draft Reports were exchanged and shared with a wide cross-section of irrigation officials to evaluate their validity under actual working conditions. Later, all these draft Reports were filed together to form the first draft Report of the Inception Report (IIMI 1991).

The objectives of the research were defined as indicated below:

- i) To test and assist in the implementation of organizational and management innovations which would improve the performance and sustainability of irrigation systems.
- ii) To strengthen irrigation management institutions including farmer organizations to effectively participate in system management.
- iii) To assist in implementing design and rehabilitation innovations and alternative system management practices.
- iv) To assist in testing and implementing appropriate on-farm water management practices for diversified crop cultivation and farm income maximization.

In August 1991, a workshop was held in Hambantota to discuss the Inception Report before implementation of research activities. This was a well attended workshop with about 90 percent participation of agency staff from the project and headquarters. Large numbers of high ranking officials from the ID, the IMD, the DOA, the DAS, the MEA, the IIMI and the Ministry of Irrigation and Mahaweli Development attended the workshop despite busy schedules. All the proposals on the research components were presented by the respective Sub-Committee Chairmen and this can be considered a very important milestone in the field of action research. Participation by these officials was exceptionally good and it could be observed that there was a great potential for further improvements of their skills in presenting papers and participating in discussions.

4. SOME OF THE IMPACTS OF THE RESEARCH

In general, irrigation related research is being carried out to investigate the issues in the areas of concern in order to ascertain problems and constraints. Basically, this program envisaged such a plan of action. More importantly, the Phase 11 objective was to improve the performance of the irrigation system rather than to implement a traditional type of research for research sake. The prime objective of improving overall efficiency could only be achieved through the innovations suggested in this type of a research mode. Also, it is required to internalize such innovations to guarantee sustainability. It is human nature to repulse new ideas because it is naturally convenient to follow existing procedures and methodologies and also because the implementation of such innovations is more laborious and time taking. On the other hand who cares for the performance of the irrigation sectors? Top management needs only to avoid crop failures. So it is very important to get the irrigation actors to participate in the innovation processes, so that they get familiarized and accustomed to the change in a less turbulent manner. This section of the Report intends to analyze the changes which occurred in the working environment, including interdisciplinary co-operation, professional development, attitudinal changes and other related improvements in management.

4.1. Working Environment

Any development or management activity needs a healthy working environment to be able to deliver an acceptable quality and a satisfactory quantity of goods and services to beneficiaries in an efficient manner. If the environment is not conducive to success and is full of turbulence, friction, interdisciplinary rivalries, etc. the quality of the goods and services may not be realized as desired. As it is defined and understood today, the development and management of any project requires contribution from a broad spectrum of disciplines. In view of the need for mobilizing resources from different directions to a focussed activity, it is absolutely essential to generate mutual understanding and respect among the multi-disciplinary teams. It is also vital to note that participation and contribution becomes more effective and productive in a friendly environment rather than in an official or hostile situation.

The Sub-Committees and the project level SCC have provided a good platform for agency officials and the IIMI staff to discuss problems and related issues more openly (perhaps at gut level). It cannot be firmly stated that these discussions disclosed everything without any reservation. Despite any such reservation however, it was possible to surface some of the issues which are very useful in improving management. Small group discussions have become more productive because of the understanding generated among the members. Consequently, these members have started to think more positively by realizing their weaknesses. This environment has facilitated others to comment and suggest various alternative ways and means for achieving better and better results. It would have been much more interesting if we could have include a few farmer representatives at these Sub-Committees and SCC meetings but it was not considered because of the language problem and the technical nature of the proceedings. However, this area must be considered seriously in the future to strengthen the innovations and related activities through better awareness.

At the inception of this research and even before, critical comments made by others (IIMI or other line agencies) on irrigation management issues, were not received by the concerned agencies in a positive manner. Generally, these comments were answered in a defensive style and did not make the agency concerned than realize the need to improve their activities. When agencies started a dialogue at Sub-Committee level they became more friendly and began to have had an understanding of each other which has helped the group to work towards a common goal by correcting and adjusting their traditional methods. Finally, it may be concluded that agency officials have changed their attitude and have begun to address project level issues in an integrated manner than rather working in isolation.

4.2. Transparency and Credibility

Departments which have existed for a long time and other government institutions generally do not welcome foreign or outside intervention in their area of responsibility. They have been so trained to be uni-disciplinary and always there is a tendency to conserve and preserve long-lived traditions, procedures and methodologies. They firmly believe that their way of working is the one and only way to solving their problems because their procedures and methodologies have

been tested by time. This is true to a great extent, and would remain true if the world had not changed. The dynamics of environment always necessitates changes in procedures and methodologies. The classical example is the introduction of farmer participation in irrigation development.

It is quite usual to note that most of the irrigation related agencies have resisted these changes because of the feeling that changes may undermine their authority and endanger their existence. Therefore, this resistance is natural. When discussions on the subject were initiated at the grassroot level, it was noticed that members of the committees became more aware of the nature of the changes required to improve the performance of the irrigation sector and resistance lessened.

It is natural that people do not like to be humiliated in public and also that they like to share their problems, difficulties and weaknesses with someone who is in intimate terms with them. The advantage of small group discussions is that you are so intimate with the other group members that you can share your problems and even your weaknesses. This is the early stages of a transparency which can later be developed in the higher and higher levels of the hierarchy. When you are frank and genuine, others would try to behave so too. If one is transparent it is relatively easy to find solutions to problems. This is like telling the truth and nothing but the truth to your doctor. It was observed that officers who were transparent certainly improved working relationships among the group members and also with beneficiary farmers. This helped improve the credibility of the institution among clients and parallel counterparts.

4.3. Professional Developments

The formation of the SCC and the Sub-Committees were done, as explained in the Section 3, to improve participation by agency staff and also to internalize the innovation carried out in this research. As described in IIMI's mission statement, enhancing national capacities in irrigation management is one of the prime objectives of the IIMI. Although not the prime objective of the research program, the professional development which resulted from this research can be considered a valuable by product.

As explained previously, the Committees which were formed and which functioned throughout the program, provided ample opportunities for agency officials to discuss their issues and problems. It is a well known fact that most engineers usually keep silent in most forums and limit their discussions to their own colleagues. At the beginning, engineers were a bit hesitant to speak in English because of stage fright and the language problem. Eventually though it was noticed that most of these engineers (as well as other officials) actively participated in the discussions during Sub-Committee and SCC meetings. Their stage fright and the language barrier disappeared gradually through participation in small group discussions initially and later at higher level meetings. During the process they learned how to present their views at these technical meetings and also learned how to manage meetings as Chairpersons. It is noteworthy that the workshop papers on the Inception Report were presented by Sub-Committee Chairpersons. The organizers were somewhat doubtful of the ability of these Chairpersons (not

all) to make presentations to such a wide cross-section of national and international intellectuals. But they proved beyond doubt that they were capable and that they could rise to the occasion. Some of them, especially those who could not speak English did quite a lot of homework, held rehearsals, etc. and performed exceptionally well. It can be stated that this workshop was the turning point in our efforts to promote professional development. Also, it gives one pride to note that most of the officials who participated in this research program have become very effective speakers and research partners whose services could be used in the project area and even elsewhere in improving the overall performance of the ID. In addition to the above, they got the opportunity to write short reports, analyze irrigation related data using computer packages and received training on recently developed computer packages.

4.3. Changes in Attitudes

Attitudinal changes in the irrigation bureaucracy began with the formation of the IMD. It was not a good start because the poor quality of the IMD approach created a lot of friction and an unpleasant working environment. In general, in all the major irrigation projects, the IMD organized farmers and formed farmer organizations ^{have began to} supervised and policed ^{by} ID staff. This approach created an animosity between the farmers and the ID staff. The relationship between the ID and the IMD also deteriorated creating quite an unpleasant working environment. All these problems were the result of the extremely inappropriate approach taken by the IMD. From the IMD's point of view, it was the fastest way to initiate farmers on the need for organizing and to organize (conflict situation) them quickly.

The IIMI started its activities in Sri Lanka and in the KOISP, when the relationship between the farmers, the IMD and the ID was at a cross-road. The Phase 11 study period was somewhat better than the Phase I period ~~long period~~ due to the longer period of association of the ID staff with the IMD and farmer groups. The ID staff (particularly the senior members) had already been exposed to concepts on farmer participation and were prepared to participate in the proposed change.

During Phase 1, the relationship between the ID and IIMI was not so good especially during the research period because IIMI was then trying to identify problems concerning overall project management. It was to be expected that a poor relationship would prevail and also a defensive attitude. It was also evident that at the end of the research IIMI would suggest long list of recommendations. These recommendations have been finally agreed upon for implementation. This acceptance shows that the ID changed and was prepared to adopt a more positive way of thinking. The receptive quality in key officials certainly helped in the implementation of the new suggested methods and procedures in irrigation management. There are advantages and disadvantages in any method, procedure or innovation. If it helps to improve the program, positive points should be picked up for implementation. A pessimistic attitude would certainly become a stoplog in improving the performance of activities. During this long period of association, the ID staff involved began to listen and to tolerate certain innovations proposed by outside organizations like IIMI. When they saw the positive impacts of the first few innovations, it became easy to fine tune further and to implement more detailed and complicated activities.

It is very hard to separate the impact of IIMI programs from others. However, the attitudinal changes brought about in ID staff and others, were the result of IIMI's work and other similar interventions over a long period of time. The following are major attitudinal changes which were observed:

- * A positive approach towards change.
- * A receptiveness towards new ideas.
- * An improved relationship with farmers.
- * An improved relationship with other agency officers.
- * Mutual respect and sensitivity to issues in other disciplines.
- * A dedication and commitment to improved performance.

4.4. Development of Improved Procedures and Methodologies

As discussed in previous sections, it has not been easy or simple to deviate from long existing and time-tested procedures and methodologies because of the extra effort required and also perhaps for the simple reason that this could lead to controversial situations under existing financial and administrative regulations. However, all the changes relating to the identified innovations were effected within the existing framework. The small group discussions and detailed evaluations of the existing procedures allowed all the participants to comment and contribute towards improving the present level of management. Since the groups comprised of multi-disciplinary members, gray areas were brought to light. They could understand the difficulties and constraints faced by the implementors. Certain conceptual ideas were discussed in detail in view to evaluating their applicability and practicability. The discussions held at Sub-Committee and SCC levels provided ample opportunity for all members to review existing practices critically and productively. The Committee Chairperson had to take the leading role. They had to put extra effort into developing the initial details before the Committee meetings. When ideas were submitted to the Committee the Chairman was compelled (sometimes indirectly forced) to throw the ideas out for discussion. This type of approach was very useful in initiating the other members rather than IIMI into pushing new concepts which often repulsed (not always). Such a strategy was useful in the implementation of the innovations. Most often the Chairperson is the most responsible officer carrying out that activity as part of his day-to-day work. So this is in the correct direction. The following can be identified as the few procedural and methodological changes which were effected.

- * Data collection and communication.
- * Daily computation and display of discharges.
- * Water balancing and data collection in the EIS.
- * Maintenance norms
- * Minimum operating levels (MOL).

4.5. Improvements in Management Activities

Since the KOISP project was implemented to field test the advanced alienation it became a complicated affair due to simultaneously dealing with operation, maintenance and construction. In addition the situation became more aggravated due to the fact that the Kirindi Oya is the most water short system in the country. Moreover, the Project is not totally a newly developed one and is coupled with a system which has been in operation since 1870. This can be considered the most complicated management problem. It is a good venue though to try out different management alternatives to solve the problems of farmers.

During this research period, a study was carried out to evaluate the performance of turnout attendants (TOA) in the Right Bank system. This study was focussed on travel distances, time taken for operations and the service area operated by each TOA with the view to assessing distribution of work and also to readjusting responsibilities. Due to certain practical problems, management changes could not be implemented but this is a correct approach to take in future projects.

A series of management changes were effected in the daily data collection program so that the sub-system managers could monitor the water situation on a daily basis by comparing data collected with designed discharge. The collection, display and communication of data was effected in the Right Bank system and it is felt that this should be replicated in the Left Bank area. Initial work was done and the programme was implemented during one season. It was not a total success due to certain difficulties related to training the TOAs and other staff. However, there is a great potential to improve performance during the next Maha season.

The procedures regarding maintenance management was changed in one sub-system with considerable support from TOA level up to Deputy Director level. The method of identification, time frame for planning, method of execution during both cultivation and off-seasons was changed to suit the present context. Also, this innovation provided sufficient room for farmer participation. On the other hand, the analysis of overhead costs and physical maintenance costs clearly disclosed the ineffective use of limited financial resources. In the light of this analysis, an economically feasible and technically viable size of an irrigation division was defined for ID use for reorganization of irrigation administrative boundaries in the future.

The formation of a Technical Committee for the preparation of a cultivation plan for the Project is the most important milestone in this research program. Initial work was done by IIMI and the Water Management Secretariat of the ID was the driving force in this activity. The activity was implemented by the staff of the ID, the IMD, the DOA and IIMI and the Committee prepared a technically sound and water efficient plan. This Committee filled a vacuum which existed in the Project between the PMC and line agencies. Before the PMC, this Committee could meet to review the situation and to formulate a reasonably acceptable and technically sound proposal. The proposals to divide the system into zones to predict inflow pattern and allocate water for a particular cultivation pattern were well-supported and were contributed by the IIMI international staff members. Planned cultivation has become part and parcel of

irrigation management. Kirindi oya can be considered a classic example of cultivation planning under water short conditions. This concept of cultivation planning was thoroughly discussed with farmers, politicians, higher level administration, etc. Despite early set backs, the practice is now deeply rooted in the minds of farmer leaders except for a few rebel groups.

The other important management intervention was the water balance and reservoir operation changes effected in the poorly managed EIS. Due to operational changes such as the minimum operating level (MOL) ~~being~~ spillage ~~introduced~~ from the tank system become zero during the Maha 1992/93 season. Water releases from the Lunugamwehera Reservoir were kept to minimum levels to absorb local run-off. This created increased salinity in the tank water, weed growth and cultivations in upstream reaches of tanks. These issues need to be dealt with in the coming seasons.

The above mentioned management changes are some of the innovations that were implemented during the research period. Due to limitations imposed in this paper, all the changes that took place will not be discussed.

5. RESULTS AND LESSONS LEARNED

This section intends to deal briefly with some of the important results of this research.

5.1. Participatory Action Research (PAR)

During the Phase 1 study, IIMI had conducted the research program with the assistance of the ID and other agencies, in a few selected areas. The research outputs were shared with a limited number of agency officials. The PAR was conducted in association with agency officials and to some extent with farmer participation. In general, research is carried out by researchers with little participation from the system managers and other related officers. Therefore, the findings and recommendations of such research need to be internalized in a second phase. In the PAR process, ideas and concepts are generated and implemented side by side. The PAR mode of research is the most appropriate method for the implementation of a series of innovations to improve system performance. This is the first time in our irrigation history that such an innovative research approach has been used. As already discussed in the previous chapter, PAR takes care of following aspects.

- * Identification of research areas.
- * Mobilization of project level human and material resources.
- * Professional development of irrigation officers and improving the capacity of farmers for management.

- * Creating an awareness of innovations and educating all on new findings.
- * Generating commitment in agency officials.

Although PAR has been identified as a research method it can correctly be considered a strategy to improve performance. Unlike in other development projects implemented with the assistance of consultants, PAR provides the opportunity to incorporate the opinion of participants and to evaluate findings while the activities are in progress. Certainly, this evaluation is useful to test whether the research work is proceeding in the right direction rather than carrying out post-mortems later. So it can be concluded, that PAR is a result oriented research program which has the distinct advantage over other modes of research in participatory irrigation management.

5.2. Cultivation Planning

At the inception of the Project, it was envisaged to develop a policy on the water rights of each sub-system in the Project. Also, a need was felt to develop a workable plan for cultivation on a long term basis. Since the beginning of the research program, IIMI staff have suggested different strategies in cultivation planning and have discussed these with project level and Head Quarters level staff. Also, IIMI is represented on the Ministerial level task force for water allocation.

With inputs from the top and the bottom, Project level staff have formed a Committee for cultivation planning which is represented on by all the agencies at project level (IIMI April 1993). Using available inflow data, the Committee has suggested different water availability conditions and prepared cultivation plans to suit the characteristics, traditional rights, climatological conditions, etc. This plan was discussed at different levels of the hierarchy and has been shared with beneficiary farmers.

The Project level cultivation plan was submitted to the respective Head Offices of the line agencies and also to the relevant Ministries to obtain their concurrence with the view to minimizing political interference.

Even before the development of this plan, KOISP was using the recently observed inflow data when planning for forthcoming seasons. They used the criteria of rice crop equity for each Tract and the rice crop opportunity was rotated seasonally. The distinct advantage of this plan is that it predicts the most reliable quantity of water for a given season with minimum risk and plans for that quantity. The procedure minimizes the risk of crop failures. Should the inflow exceed the minimum probable flow, then the staggered cultivation technique is used based on climatological conditions and agronomic recommendations, to extend rice-cropped areas to fallow areas.

The experience gained from this activity is very useful in planning cultivation in water short systems. The cultivation plan is now being accepted by most of the project level agency officials, farmer representatives and farmers.

5.3. Minimum Operating Level (MOL) and Water Management in the EIS

In the past, due to pressure from farmers, irrigation managers were compelled to store water in the small tanks in the EIS to start cultivation around mid-September and mid-October. This is a rather drier period compared to late October. When these tanks are full, they cannot absorb local catchment runoff during rainy periods and therefore they spill over into the sea. This was highlighted in the Water Balance Study. The study recommended keeping tanks at minimum operating levels which would provide ample capacity to absorb rainfall contribution. At the beginning, this recommendation was highly criticized by some engineers and EIS farmers. They pointed out that by doing so they would lose water rights enjoyed by them over the new settlers. The study also suggested a time-table for release of water to the EIS with due consideration being paid to maximizing the use of drainage water from the newly developed areas and local runoff. The major recommendations emerging from this study area are as follows:

- to keep tanks at MOLS,
- to start cultivation when tanks reach their MOLs from their own catchment inflows,
- to use pre-planned water release plans for releasing water from the main reservoir,
- to monitor water conditions daily with the view to minimizing wastage.

There were certain problems created by the implementation of these recommendations and they are identified as follows:

- increased salinity in tank water,
- shortage of water for domestic purposes and cattle,
- weed growth in tanks,
- cultivation of upstream areas of the tank when water levels are low,
- reduction in the scenic beauty of tanks located near tourist areas,
- adverse effects on fish culture.

These side-effects are still under study and remedial measures will be suggested in the Final Report. By using the study recommendations, substantial quantities of water were saved during the past couple of seasons and this proved very useful under water short conditions.

5.4. Data Collection and Communication

In comparison to other systems, the KOISP has been following reasonably better operation and water management practices. This is because, during the initial stages of operation and just after the KOISP was commissioned the ADB provided a Water Management Consultancy Package with the assistance of a group of consultants. They studied the Project and

submitted a manual for operation and maintenance of the Project. Thereafter, IIMI became involved with Project activities in 1986 and their activities during both phases influenced Project O & M activities.

During the Phase 11 Study, the Simulation Modelling Project was introduced in the Right Bank Main Canal with assistance from the French Government. The study group improved existing procedures for data collection, communication and analysis of daily discharges in strategic locations along main canals (gated regulators) and at main canal offtakes. It is important to note that displaying target and actual discharges have made system managers more sensitive to water conditions in the field and have encouraged them to take immediate remedial measures. This needs very effective communication between the operation centers, field units and central management body. Communications between the field units and operation centers were established through messengers and the link between the operation center and the management body is being done by telephone. During the research period, daily discharge calculation was done and the practice is being carried out even now. Also, system managers compute cumulative water consumption in each tract and these figures are compared with the targets. All these activities have contributed to water management efficiency and during the past few years water consumption has come down drastically. There is no doubt that performance can be further improved by managing the system more technically and systematically.

The other important impact is the improvement in the quality of operations carried out by the lower level agency staff. These operators were trained to read, record, communicate, receive feedback and to readjust gate settings. It has now become fairly easy for operators to operate the system using only a minimum number of adjustments. Farmers too are of the opinion that the services supplied by the ID has improved.

After undergoing the experiences in the Right Bank system, the ID and IIMI took the initiative to expand the data collection and communication method to the Left Bank system. This alone shows the impact of this program. By the end of Maha 1993/94 a uniform data collection network ~~was~~ installed in the Project area.
will be.

5.5. Maintenance Procedures

Maintenance is an area most system managers pay little attention to due to poor monitoring mechanisms. The maintenance management program implemented in the KOISP pilot area aimed at improving performance by:

- identifying and planning maintenance work,
- improving maintenance implementation, and
- improving the financial management of O&M funds.

The procedure pilot tested for identifying and planning maintenance work and preparing cost estimates proved that the available limited financial resources could be more effectively used if maintenance work was first identified and prioritized. The early stages of the maintenance

process provided an opportunity for farmer organizations and the IMD (third umpire) to participate in planning activities. Once the estimates had been prepared, they were discussed at ratification meetings at sub-system level. These discussions helped system managers overcome problems by selecting the most needing items (hydrological) for maintenance and also by helping mobilize farmers resources. The methodological and procedural rules improved the quality of work, ensured effective use of limited financial resources and encouraged farmer participation. Also participation by IMD staff is a real breakthrough in maintenance management and has made them aware of the activities carried out by the ID. Also, the changes which were implemented opened the doors to the ID and has enhanced the Department's transparency.

The most outstanding finding in the fixing of maintenance norms for TOAs. The research findings disclosed that TOAs could be used in maintenance work by deploying them systematically along selected sections of the canal with specific norms. ID norms for certain items are rather average under general conditions. In practice, the technical officers of the ID could perform simple work studies to check the validity of existing norms and ensure TOAs provide a more realistic quality of work on a daily basis both during cultivation seasons and off-seasons. Now these norms are being used across the Project and will be further refined in due course to obtain Project level norms for routine maintenance work.

Under normal circumstances the ID allocates maintenance funds to administrative ranges and divisions, based on command area. This research has suggested that the following year's maintenance program be prepared during the latter part of the present year based on the needs of the system. IIMI has provided a time frame so that ID Headquarters will be aware of actual requests before money is allocated. This will also provide a good basis for discussing the under investment in maintenance with the financial authorities of the Government.

The study on maintenance expenditures during the past few year revealed that most of the allocated funds were used to cover overheads and meet administrative costs. Very little physical work was carried out, and that in a sporadic manner with no proper implementation plan. This study worked out a reasonable amount of administrative costs required by an irrigation division and suggested a demarcation of administrative boundaries to adjust service areas to a financially viable size. This matter should be taken up at Head Office level where reorganizing administrative boundaries to cut down unnecessary overhead costs and making best use of the available human and other resources more effectively and efficiently, can be discussed and considered for implementation.

5.6. Pilot Testing of Other Field Crops (OFCs)

From the beginning of IIMI's association with the KOISP, they have been interested in promoting OFCs as a solution to the burning issue of water shortage. Consequently, the ministry decided to develop the LB Tract 3 area for the cultivation of OFCs during both seasons. The experiment in that area was carried out during Phase 11 of the study and the research findings suggest certain crops can be grown during both season with successful economic returns. Suitable crop combination, land levelling, land preparation, drainage

requirements, etc. are some of the findings of this research which can be replicated in other areas.

During Yala 1993, due to a very acute water shortage problem cultivation in the EIS was restricted to 50 percent paddy and 50 percent of OFCs. It was a remarkable achievement that the very strongly rice-biased farmers of the EIS cultivated certain suitable sections of their field with OFCs. The area cultivated was more than 2000 acres. This is the first time in the history of the EIS (100 years) that farmers had opted to do OFC cultivation at the cultivation meeting. It is encouraging that farmers cultivated a limited extent of paddy (it is almost the agreed extent) and OFCs and harvested the same without crop failure. Water was allocated to the farmers based on the irrigable extent for which they were given the opportunity to decide the crop combination and the location of the cultivation. Of course for the farmers to do this, it was necessary for the officers to advise them in technical matters and to solve other conflicts.

5.7 Water Sharing Techniques

Water distribution in FCs during the land preparation and crop growth periods was done using a time allocation method devised by the farmers. IIMI did a field test of the time required to soak the land at the start of the cultivation season. It was felt that the time given to farmers was insufficient to wet the entire one hectare allotment. Therefore the pattern of borrowing other farmers' turn with the promise of returning it at a later date was the practice followed in canals in which command areas exceeded 14 - 16 allotments. In canals with a small command area the practice followed during the land preparation period was simultaneous sharing. The ID and IIMI did quite a lot of home work and prepared a water sharing method for field canals with different command areas (i.e. those which differ in number of allotments under each of them). The water sharing method thus developed provided sufficient time for land soaking and later to maintain the water level in the allotments. This method was field tested in a number of locations and found to be successful from the point of view of farmers and operators. In the past, the resource requirement of each farmer for land preparation and his readiness to start land preparation activities was not considered when allocating them a time to share water in the FC. In the new technique attention has been given to such parameters and the plan can be adjusted to suit site conditions on the mutual agreement of the members of the FC group who are supposed to interact with each other under the guidance of the farmer representatives to prepare and adjust the plan according to their needs and requirements.

A training program at FC level was carried out by the ID at night in the areas where the innovations were pilot tested. This program was implemented before the commencement of the cultivation season. A less intensive training program was carried out in the rest of the Right Bank system to extend the innovation to cover the entire Project. Due to poor participation by the IMD field level staff and a lack of motivation in them, it was not possible to implement this program. However, there is great potential for reducing water consumption during the land preparation period over the next few seasons by implementing this rotation plan.

6. DRAW-BACKS IN THE PAR PROGRAM IN THE KOISP

There are drawbacks and weaknesses in the Participatory Action type of Research from the view point of researchers, operators and beneficiaries. It is not intended in this section to analyze the PAR technique against traditional research modes. However, it was our experience that PAR has done more to improve performance than any other method of research has done, for the overall improvement of the irrigation sector. Nevertheless, it is quite appropriate to review the procedure and process that we have followed during this short period of three years. The following section will discuss a few drawbacks and weaknesses which could certainly have been overcome during the research program. Some of them were rectified then and there to suit the circumstances. Since this is the first time such a mode was implemented in Sri Lanka or anywhere for that matter, a learning process approach had to be followed as there was a certain amount of "learning" to be done.

6.1. Preparation TOR and Inception Report

It is very well known to participants that the TOR of this research programme was prepared based on the findings from Phase 1. The gap between Phase 1 and II is almost negligible and therefore the recommendation from Phase 1 matched with the then existing conditions in the Project. It is not clear how the TOR was prepared and it is understood that the TOR was prepared by IIMI alone. If this is true, this paper suggests that it would have been more applicable and acceptable to prepare the TOR with the participation of line agency officers to mobilize and motivate them in research activities. The commitment of the participants would have been increased if they had participated in the preparation of the TOR.

The Inception Report was prepared on site by IIMI staff with the substantial participation of agency officials. In the case of certain research components, the participation and contribution of ID and DOA staff was exceptionally good. Certain officers of a few Departments participated only because of the commitment of their Heads of Department. The draft Inception Report was re-written several times to suit the thinking of several international staff members. The content remained the same but it was presented in many different forms which later created confusion among the agency officials as well as among IIMI national and international staff. Some of the international staff members were employed on a part-time basis to improve the Report after the workshop. This was too late because all had already agreed upon the areas to be researched by this time. We should have done this at the beginning at an in-house workshop with field levels and Head Office level staff members which would have minimized the time wasted in rewriting (about five times). Because of the busy schedules of international staff members it was not possible for them to contribute much (except Dr. Sakthivadivel) towards the preparation and technical editing of the Report. Also, due to delays in getting the final version of the draft Inception Report, the respective officers did not have sufficient time to prepare for the workshop. Timely submission of reports to all categories of officers is very useful in obtaining their contributions.

6.2. International Staff (IS) Inputs

As has been explained earlier, the research design was done by field research staff based on the TOR and recommendations from Phase 1. Inputs from international staff were rather limited, particularly in the case of tertiary management. In addition, the agency staff had expected a lot of technical, methodical and procedural changes in this process. In fact they expressed their dissatisfaction about the international staff contribution. They expected something really new.

On the other hand, the researchers had also expected the international staff to visit the Project quite frequently and to stay long enough to work together. However, due to very busy schedules the international staff visited the site in a rather hurried manner and the discussions were rushed through due to their inability to stay long. It was also experienced that field researchers could not interact with international staff on details concerning technical matters related to research due to limitations of time. When Consultants were hired (internal and external) they spent substantial time at the Project discussing various technical issues related to methodologies, data collection, processing and analysis. These activities really helped improve the quality of research work.

6.3. Awareness of Research Activities

Since this program is participatory in nature, awareness among the agency staff (both at Project and Head Office levels) and the farmers is an absolutely essential ingredient. Also, due to the fact that this research mode is a new experience for all parties, we identified various aspects of the research during implementation. Almost all the foreseen activities were identified and implemented from the inception onwards. The need to create an awareness among the lower level staff of the agencies and the farmers was identified somewhat late. This situation created suspicion concerning the various activities and on the whole, people were already suspicious of IIMI's involvement in irrigation development in Sri Lanka. Implementing awareness programs on research activities and their responsibility in advance would certainly help in the implementation of the activities themselves. This was an area which we did not deal with appropriately. What really happened was that we identified needs and in a haphazard manner attended to these needs. Nevertheless, we did achieve better results during the latter part of the research program and currently IIMI's position and its mission has been made clear to farmers and their leaders.

6.4. Training Needs and the Budget

The original budget did not allow monetary provisions for training and related awareness creating programs and meetings. In addition, no provision was made for SCC, SAC and Sub-Committee Meetings to be held in the budget. Since we had a substantial amount of contingency funds though, this mistake could be rectified. In preparing budgets for PAR research programmes, training components and 'meeting' expenses should be included, since this involves quite a large sum of money. Also, for informal discussions, etc. always follow for a small get-

together with tea and refreshments. All this was not foreseen at the inception. Yet 'Meetings' were the driving force in our research work.

At some stage it was noticed that the training skills of agency officials had to be enhanced because they acted as trainers to lower level staff, as well as to farmers. So a group of agency officials were selected as trainers and given a very short course on training skill development. This is another important area which should receive more attention in future PAR programme.

7. CONSTRAINTS

It is no wonder a few constraints had to be faced which really retarded the momentum of research work in the Kirindi Oya Project. Most of the constraints such as the water short situation, heavy work loads and the instability of the irrigation environment were beyond the control of all the parties. A few of the constraints that existed were overcome by hardworking agency officials and IIMI staff.

7.1. The Water Short Condition

This condition is beyond the control of both researches and agency officials. Due to the uncertainty of water availability most of the farmers and a few of the agency officials were highly discouraged and demoralized. Due to water scarcity, water issues were not made to all the Tracts every season (even during Maha) except during a few wet years. Consequently, the newly settled farmers generally go back to their villages of origin in search of income generating activities. Thus project management has been faced with lot of difficulties in maintaining irrigation infrastructures and organizing farmers for irrigation management. Due to this problem of migrant farmers, almost all activities organized under the tertiary management research component became meaningless. However, a few innovations were implemented.

Similarly, cultivation planning and the implementation of main system management innovations were affected by non-cultivating areas. Cultivation planning and the development of guidelines to allocate water amongst the sub-systems became very tedious. Also, political powers within and outside the project area started to undermine the whole cultivation plan.

7.2. Unstable Social Conditions

In the newly developed areas, settlers were brought to the Project area from adjoining Electorates and Districts in the Southern, Sabaragamuwa and Uva provinces. These settlers brought inherited local traditions, customs and social and cultural norms with them to the Project. This has created a somewhat turbulent condition in the Project area. In some cases cultivation practices, types of crops grown, etc. differ even among those from the same category. This has further complicated already existing problems. Further, some settlers did not have previous experience in agriculture.

Generally, the people in settlement schemes evolve into a stable community after a substantial period of time has lapsed. This due to their close association with each other, marriage relationship, etc. Until such time a community spirit may not be visible to organize them in a common cause. Under such circumstances there can exist quite powerful differences and friction between the people. This situation is not healthy for institutional development in the farmer community. This is also true of Government agency officials because they are disturbed by Project activities.

In fact, the IMD has been implementing a very well-defined institutional development program with heavy investment. It was observed that this program could not realize its objectives because of poor implementation of institutional development work. The IO program was not effective because of a lack of a substantial monitoring system for rectifying mistakes. Also, between the Government agencies was observed a sort of hidden rivalry and they were not frank with each other. All these parameters affected the progress of the research program.

7.3. Heavy Construction Program

As well known to everyone, the KOISP has been involved in a heavy construction program during this research period. The ID and the LCD officers were heavily overloaded with their construction program and therefore they could pay very little attention to the study program. The Heads of line agencies pressured their field level officers to achieve the physical and financial targets which were of highest priority to them. Therefore, it can be concluded that the construction period was not very conducive to the success of the for research program. Also it, can be stated that activities such as the main system the management, maintenance management (normally this has a very low priority) and the tertiary management research components were heavily affected by construction turbulence. It was also noticed that some of the components of irrigation infrastructure development were not fully completed. Development of this nature needs a reasonably long time to stabilize before any heavy research program. Because of the sensitivity of this environment and the state of the irrigation infrastructures directly influence system performance.

7.4. Image of IIMI

During the Phase 1 work and since, IIMI has been engaged in a fact-finding type of research work and Project level staff particularly have felt that IIMI is a trouble maker who is always trying to find fault with the agencies. Due to this misunderstanding, agency staff and even farmers did not have faith in IIMI and they suspected IIMI's motives. This was a negative force impending the implementing of a PAR type of research where mutual understanding and trust in each other is required. Also it is required to have mutual respect for ideas and proposals submitted by all partners. When inter-relationships are rather weak, the productivity of the research program falls below expectations.

8. CONCLUSION

The PAR program was successfully implemented to the satisfaction of all partners in the irrigation sector. Even though the program began somewhat slowly, it eventually gathered momentum. Many mistakes were rectified during the implementation of the program with minimum deviations from the original objectives. The KOISP is a classic example of constraints, problems and complicity. Despite efforts of opposing forces, the PAR was implemented to our great satisfaction. In fact, this is the type of research which should be implemented where troubled and turbulent situations prevail. The concept of PAR is a better method than the basic or fundamental research to improve the overall performance of irrigation systems.

Secondly, PAR is a very good way of bringing project level staff together to create a good working environment. As is well-known, inter-departmental rivalries is a big hindrance in any development activity. Project level group discussions, the SCC, etc. provided golden opportunities for officers from different agencies to interact very frequently and to discuss their problems frankly. These activities generated interdisciplinary cooperation and improved the integrity of agency officials. The plans and proposals prepared by them became their own work and it improved their commitment to the work plan. Ultimately the beneficiary farmers received a better service. This mode of working (as a one group) exhibits the integrity of the officers which in turn increased the confidence of the farmers. Accordingly, the credibility of agencies was dramatically improved and the farmers too became more disciplined. Farmers tend to think as partners and they participated in Project level activities as equal partners (not as the trade union type of demanding groups).

With the implementation of all the activities under each component it was observed that tangible results were visible. These results are in the areas of operations (water duty, equity, minimum wastage) and maintenance (cost effectiveness, sustainability, effective use of limited resources, farmer participation). Therefore, PAR is a good methodology for enhancing the performance of Operation and Maintenance of irrigation projects, which is the objective of all the partners such as managers, researchers, farmers and policy-makers.

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