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IRRIGATION MANAGEMENT NETWORK

NEWSLETTER

ODI/IIMI Irrigation Management Network Paper 89/1a July 1989

Agricultural Administration Unit, Overseas Development Institute, London

The Overseas Development Institute (ODI) is an independent, non-profit making research institute. Within it, the Agricultural Administration Unit (AAU) was established in 1975. Its mandate is to widen the state of knowledge and flow of information concerning the administration of agriculture in developing countries. It does this through a programme of policy-orientated research and dissemination. Research findings and the results of practical experience are exchanged through four Networks on Agricultural Administration (Research and Extension), Irrigation Management, Pastoral Development, and Social Forestry. Membership is currently free of charge to professional people active in the appropriate area, but members are asked to provide their own publications in exchange, if possible. This creates the library which is central to information exchange.

The International Irrigation Management Institute, Colombo

The International Irrigation Management Institute (IIMI) is an autonomous, non-profit making international organisation chartered in Sri Lanka in 1984 to conduct research, provide opportunities for professional development, and communicate information about irrigation management. Through collaboration, IIMI seeks ways to strengthen independent national capacity to improve the management and performance of irrigation systems in developing countries. Its multidisciplinary research programme is conducted on systems operated both by farmers and by government agencies in many co-operating countries. As an aspect of its dissemination programme, it has joined ODI in the publication of the Irrigation Management Network papers, to enable these to appear more frequently to an enlarged membership.

NEWSLETTER

Contents **Page**

Papers in this set:

89/1a Newsletter

89/1b Identification of Causes of Poor Performance of a Typical Large-sized Irrigation Scheme in South China by Mao Zhi

89/1c Rehabilitation of Communal Irrigation Schemes in Nepal by Nasiruddin Ansari

89/1d Economic Returns to Operation and Maintenance Expenditure in Different Componerts of the Irrigation System in Pakistan by Muhammad A Chaudhry and Mubarik Ali

89/1e Irrigation and Water Management for Diversified Cropping in Rice Irrigation Systems: Major Issues and Concerns by S I Bhuiyan.

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NEWSLETTER

1. NETWORK DEVELOPMENTS

We are happy to report that the result of the ODA evaluation of the AAU Networks was a very positive endorsement of their value. We are very grateful to all members who took time and trouble to return evaluation forms. We also learnt something more about your reactions to the material we send out, and this is also useful. It was pleasing to find you think the Newsletter useful as well as its accompanying papers, and I was flattered to find that the papers I had written on *The dominance of the internal rate of return as a planning criterion and the treatment of O&M costs in feasibility studies* and on *Rehabilitation and participation: The views of the engineers*, were those most frequently mentioned as stimulating - and particularly the first. Other high scorers were those by Berkoff, *Matching crop water requirements in large systems with a variable supply - experiments in India*, Patil on *The economics of farmer participation in irrigation management*, Toulmin and Tiffen on *Groundwater management: Equity, feasibility and efficiency*, and Small on *Irrigation service fees in Asia*. It was good also to see that the papers are regularly passed on to other people, and that the readership is far higher than the membership list. Amongst the suggestions most frequently mentioned for improvement was print quality; this Newsletter should already show a modest improvement. More papers on farmers' participation, and on assisting the reader to understand farmer requirements were also requested. This latter request was confirmed by an analysis of members' interests as shown by the Registration forms. This is shown on page 2.

As a result of the evaluation, ODA is providing a somewhat increased level of support to the Unit in future. In the case of the Irrigation Network this has relieved the uncertainties that had been impeding permanent appointments to strengthen the staffing. In September we shall be joined by Linden Vincent, who will take main charge of the Irrigation Management Network. Mary Tiffen will continue to work in the irrigation area, for half her time, the other half being occupied by duties associated with her chairmanship of the Agricultural Administration Unit. Dr Marion Glaser, who was with us for five months, and to whom we are very

Breakdown of membership by special interests, Irrigation Management Network

23 Technology and design to facilitate management	238
24 Feasibility study methodology, data collection	272
25 Performance monitoring, ex post evaluation, performance indicators	260
26 Computer modelling and simulation	168
27 Choice and management of water delivery systems (on demand, rotation, etc)	265
28 Crisis management	53
29 Maintenance, machines, structures, canals, drains, etc	103
30 Rehabilitation, upgrading	149
31 Groundwater development, pump technology	159
32 Environmental impact (drainage, salinity, soil management)	166
33 Irrigation agronomy, choice of crops, flexibility	184
34 Water charges and recurrent cost management	151
35 On farm water management	328
36 Farmer training, extension methods	135
37 Relationships between ministries, departments, co-ordination	98
38 Staff management, staffing ratios, incentives, training	64
39 Farmer participation, water user associations, co-operatives	314
40 Farm level economics, incomes, marketing	131
41 Land tenure, settlement, resettlement	109
42 Employment, equity, welfare issues except health	63
43 Health issues	19

grateful for her work on the last Newsletter and Papers, has returned to Bangladesh to work on the development of water user associations for the Tangail Agricultural Development Project.

Linden Vincent has been a Lecturer in the School of Development Studies, University of East Anglia, since 1974, where she has taught, amongst other subjects, irrigation development and management. Her first degree was in Geography and she has also an MSc in Water Resources Development. She combines an excellent understanding of socio-economic and institutional issues with her knowledge of hydrological factors and statistical methods. Her consultancy and research experience has covered small scale irrigation development from groundwater, crop-water requirements for irrigation, administrative structures for irrigation and water management, drought analysis and the development of drought prone areas, flood risk impact on agricultural options, in countries that include the Yemen Arab Republic, India, Zambia, Nigeria and Tunisia.

We are also pleased to say that in future we shall be able to meet the needs better of networkers in Africa, and networkers who prefer to read in French. Thanks to support from CTA[1], we shall be publishing a third issue every year which is especially concerned with the development of irrigation in Africa. This will be sent only to those Networkers who live in Africa, or to those outside Africa who are professionally concerned with African irrigation, as planners, researchers or teachers. If you come into the latter category, and would like to receive the African issue, please fill in the enclosed form. The African Newsletter and Papers will be published both in English and French. We hope in this way to promote the exchange of useful experience, ideas and information between anglophone and francophone irrigation professionals. In addition, the Newsletter accompanying the two normal issues will be published in French. In this way francophone readers will be kept informed of developments in Asia and Latin America, and will be able to decide when a paper in English is likely to be sufficiently interesting to justify a particular effort to read it. The

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[1] The Technical Centre for Agricultural and Rural Co-operation established under the ACP-EEC Lomé Convention to promote better access in ACP countries to information concerned with the development of the agricultural and rural sectors.

African papers will be listed in the main Network so that those on the main Network will be able to send for papers that are likely to be useful to them.

I apologise for the fact that partly because of the planning and negotiation involved in these and other changes, this Newsletter and its accompanying Papers are arriving later than intended.

2. NETWORK PAPERS AND DISCUSSION

This set of papers continues our recent theme of rehabilitation, but the authors each treat it from a different angle.

The first paper, *89/1b Identification of causes of poor performance of a typical large-sized irrigation scheme in South China*, by Mao Zhi, presents performance indices used to quantify the need for rehabilitation, to assist in the diagnosis of problems, and to monitor the impact of the rehabilitation measures on a large scheme in China. The twelve indices cover performance in terms of water supply, crop production, maintenance of structures, economic benefit from crops, and financial viability from scheme revenues. The rehabilitation remedies included both institutional and physical changes. The indices could be used in many other countries; the institutional remedies adopted are only possible to those prepared to adopt the reform of giving financial autonomy to irrigation departments or schemes, as has been accepted in countries such as China and the Philippines.

On the issue of performance indices, Charles Abernethy of IIMI writes that he has always accepted that there are differences between equality and equity. Equity can have several other dimensions besides equality, some of which involve subjective or communal value judgements. Equality of water deliveries is one aspect of equity and quite an important one. However, "if (say) tail-enders get their appropriate share of water, but get it at times ill-matched to crop needs, then we have 'equality' but not 'equity'.... All this is rather theoretical, and the present reality is that most system managements do not now how much inequality or inequity their systems have, and are therefore in no position to assess how changes in management policies can affect these aspects. It is important to begin to change this state of affairs. That will not

happen, in practically minded irrigation agencies, if we propose indices that are ... difficult to understand". Abernethy's modified inter-quartile index was intended to be one such practical tool; Mao Zhi has perhaps suggested others which can be used to measure other aspects of performance.

Paper 89/1c by Nasiruddin Ansari, *Rehabilitation of communal irrigation schemes in Nepal*, illustrates another method of introducing financial realism into irrigation projects. He explains how the government has evolved a policy on the principles for funding rehabilitation and for deciding priorities between schemes. Other countries feeling the lack of co-ordinated policy towards irrigation may well wish to study this. One of the issues faced is how to assist farmer-managed schemes (which are responsible for the larger proportion of irrigated hectares in Nepal) without damaging either their incentives or their capacity to be self-reliant. Principles include not only farmer initiation of the request for rehabilitation, but also that farmers must contribute to the capital cost (on a scale varying according to scheme size) and commit themselves to full responsibility for O&M costs. Because it is known that the resources of both the farmers and the government are limited, a ceiling cost per hectare for the rehabilitation works has been established. It would seem to me that this latter is an important step, for it will force both farmers and designers to establish the most essential elements in a rehabilitation programme, and to distinguish these from desirable extras that may not contribute much to overall economic benefit. By concentrating on the essentials, for example, lining only in the areas with the most porous soils, cost benefit ratios are likely to increase.

It is argued by some people that rehabilitation is "deferred maintenance", and that in some cases it may economic sense not to do maintenance on an annual basis, but to put the system right every few years though a rehabilitation. Those who argue this often ignore that during the years in which maintenance is not done, productivity is likely to decline progressively, representing lost output that can never be recovered. In Paper 89/1d by Muhammad A Chaudhry and Mubarik Ali, *Economic returns to operation and maintenance expenditure in different components of the irrigation system in Pakistan*, they have attempted to find a methodology for calculating the economic benefit of regular expenditure on operations and maintenance, basing this on data from Pakistan. They also identify where this expenditure is most

beneficial. They find that agricultural production can be markedly improved by increasing O&M expenditure on the canal system. Increases are also marked if there is increased investment in O&M of private tubewells, either by increasing their number or by enhancing their utilization rate. However, the marginal benefits to O&M investments in government tubewells are very low.

In the last paper, 89/1e, *Irrigation and water management for diversified cropping in rice irrigation systems: major issues and concerns*, S I Bhuiyan argues that providing the farmer with flexibility to grow either rice or other crops in the dry season should be one of the goals of rehabilitation programmes on rice systems in the future. However, this requires an understanding of the factors influencing farmers' choice between crops, and an appreciation that his decisions will vary over time. Demand for, and the price of, rice may well increase in future. Bhuiyan argues that what requires upgrading is often the drainage system rather than the water delivery system, and that we should not automatically assume rehabilitation is necessary without examining the potential of improved management practices, and the relationship between management and hardware. IIMI research he quotes has already shown that farmers know methods of cultivating dry foot crops if these are profitable.

Bhuiyan also points out that rice systems are not all that different from non-rice systems, and that rice can benefit from ability to vary water applications at different times. This is confirmed in the paper by Mao Zhi. Chinese research showed a benefit from having a drying out period at the late stage of tillering, and varying depths at other stages. Implementing this not only increased production, but also saved water in a system equipped with many storage ponds.

3. IRRIGATION IN THE PHILIPPINES AND THE REHABILITATION SEMINAR

The rehabilitation seminar

Two of the papers mentioned above, those by Ansari and Mao Zhi, were first presented in February 1989 at the Asian regional symposium on the *Modernization and rehabilitation of irrigation and drainage systems*, which was organised jointly by Hydraulics

Research, Wallingford and the National Irrigation Administration, (NIA), The Philippines. The Symposium brought together a distinguished gathering of scientists, engineers and planners from many parts of Asia, but its Filipino hosts set the tone for much of the discussion because of their commitment to policies of transferring responsibility to the farmer, and to increasing financial viability of the NIA, which in turn necessitated, in their experience, consultation with the farmer on the objectives of rehabilitation. One of the opening speeches by Senator A A Aquino, Chairman of the Committee on Agriculture, Philippines Senate, set rehabilitation firmly in the context of the Government's war against poverty, in which its strategies include land reform, decentralization of power and bottom-up planning, appropriate levels of technology and accountability in public expenditure. Sebastian I Julian of the NIA then summed up its philosophy and experience. It is a semi-autonomous agency within the Bureau of Public Works, having 92 irrigation system offices responsible for one or more national irrigation systems, and 67 provincial offices responsible for communal irrigation works - the management of these being by the farmers concerned. He expressed the pride, which seems to be shared by most NIA staff, in the way they are ahead of most irrigation authorities in the world in having found effective techniques of organising farmers into water users groups which are now playing a major role in system operation and maintenance not only on the small communal systems, but also on the bigger national systems (the latter as described by Ferrer and Lucero in Paper 88/1c). He also expressed pride in the increasing financial viability of NIA, although the proportion of Irrigation Service Fees collected is still not as high as it needs to be, and there are acute difficulties in enforcing a no payment no water policy. The reduction of costs and responsibilities by turning over systems or parts of systems is therefore attractive. The financial situation of the agency has become even more critical since the government has transferred to the NIA responsibility for servicing the debt on official foreign loans for irrigation purposes incurred since 1982.

The grave financial situation of many irrigation agencies, and not a few governments, made me suggest in my special lecture that it is vital in any rehabilitation process to be clear who is to pay the capital and recurrent costs and in what proportions, and to consult with farmers within this context. Farmer requirements for improvements are considerably modified by the knowledge of the share of the costs they would be expected to bear; they do their

own prioritising of the problems they most wanted tackled. Dr Miranda of IIMI also drew attention to the financial limitations on rehabilitations, in discussing the net returns anticipated for rice and other crops, and in emphasising the need to plan for crop diversification, while Murray-Rust emphasised the need to take into account the financial and manpower resources likely to be available for management after rehabilitation.

The Symposium closed with a panel discussion of some outstanding questions raised during the symposium. One of these was the relationship between maintenance and rehabilitation and between both and performance monitoring to see that productivity is not lost. The Indonesian classification of activities as

	Cost (US$/ha/year)
- annual maintenance	15
- special maintenance (every 5 years)	125
- improvement works (every 25 years)	600

was felt to be helpful. It would cost the same as periodic rehabilitation every 25 years at a cost of $1600/ha but would provide a sustained level of performance.

The two volumes of conference proceedings are available from the Overseas Development Unit, Hydraulics Research, Wallingford, UK. Volume I contains the Papers presented and costs £25. Volume II contains the introductory lectures, including those of Aquino and Julian, the special invited lectures (Tiffen, Khan, Miranda and Murray-Rust) and the reports on the symposium sessions and the closing panel discussion. This costs £15. A limited number of free copies are available, strictly for Idc personnel.

The transformation of the NIA

If you only have time or money for one book on irrigation management this year, the one that could be most highly recommended is likely to be *Transforming a Bureaucracy: The experience of the Philippine National Irrigation System*, edited by Frances F Korten and Robert Y Siy. It is available from the Kumarian Press, West Hartford, Connecticut, 060110-1505 USA, or, in S E Asia, from the Ateneo de Manila University Press, PO Box 154, Manila 1099. It describes the impact on the whole ethos of the NIA of what was, in the late 1970s, an experimental

approach to the rehabilitation of a few small communal systems in the Philippines, using community organizers, and how this affected its approach to design, management and financial viability. The initial stages are described by Benjamin U Bagadion, until his retirement in 1985 Administrator for Engineering and Operations in the NIA (his 1980 paper in this Network, No 4c, is still available). Chapter 3 is a case study by Illo of the Taisan Project, showing the methodology in practice, while Chapter 5, by Romana de los Reyes and Sylvia M G Jopillo, gives the quantitative data comparing the benefits from 24 systems in which NIA used the participatory approach with 22 where it had used a more conventional engineering approach. Chapter 6, "From Bureaucratic to Strategic Organization", by David C Korten, and Chapter 7, "Summary and Conclusion", by Frances Korten and Robert Siy, are particularly important. Chapter 6 deals with the original "Technical-Engineering approach" of a typical bureaucratic organization where irrigation system design is treated as a technical problem, where users are expected to adapt themselves to the technical requirements, where design, construction and operations are the responsibility of different departments, and where design is a somewhat mechanistic matter of applying established engineering standards to site information. In the Philippines the NIA started in this mode and has now become a "strategic organization", characterised by a problem solving approach which involves continuous interaction between farmers, designers, constructors and operations personnel, because a key performance indicator has become the willingness of clients (the farmers) to pay for the services provided by the NIA - (Mao Zhi's 9th and 12th performance indices). One of the means for the transformation was the introduction of a cadre of educated and predominantly female community organizers into an organization staffed primarily by male engineers (a few of the former have now worked their way up to high levels within the NIA). These at the start worked in the Engineering Division, which Korten considers to have been the right place given the importance of getting the design process right. At a later stage, when the engineers were already converted to the new methods, they were moved to the Division concerned with agriculture, institutional development and operation. The change in the design process, in which the design was elaborated in conjunction with farmers who had already been organised, and who were aware that they would become responsible for the repayment of part of the capital costs as well as the operating costs, was at first hampered by such mundane things as the NIA's original

funding basis, which depended on annual appropriations from the government, which was in turn linked with a short-term planning cycle of one year, inadequate for the new design methodology. There were also mundane contractual problems in relation to the community organizers, and whether these were casual, permanent or contractual staff. The new methodology also involved a problem solving team approach at provincial and regional level - an approach which made it impossible for designers to blame constructors for shortcomings, and constructors to blame operators, and operators to blame farmers. The provincial engineer became a team leader, and this in turn affected the work and judgement criteria of the staff at the level above, in the region. This necessitated supportive changes in the way of retraining, etc. The change in attitudes and in organisational structures were not achieved quickly but over a period of years, starting with a pilot project in one area. Nor is the change finished; it is ongoing. Since this book was written, there has been much more emphasis within the NIA to applying the new principles to the national systems where it has the management responsibility, and where, therefore, the situation is quite different to the communals where the NIA has been responsible for rehabilitation, but not for operation. The NIA is also now experimenting with training a farmer or other local person to be the community organizer, or to retraining one of its redundant staff for this new function. Frances Korten and Siy identify some of the key features essential to the success of the Philippine transformation. These include the policy framework that demanded farmers pay part of the rehabilitation costs and that the NIA depend for its budget primarily on payments from farmers, and the legal status given to farmer associations. It is not to be expected that the methodology of using community organizers will bring about the transformation of irrigation agencies elsewhere if these underlying fundamentals do not exist.

The concrete value of participation in the larger NIA system is quantified by Nenita Tapay in one of four papers in *Organisation and participation in Southeast Asian irrigation systems*, Wageningse Sociologische Studies 25, Wageningen Agricultural University, 1989, price $11. The book contains a useful review and commentary on 'participation' and irrigation, and three case studies including the one by Tapay. The other two look at Indonesia, where Schrevel provides a critical review of the water user associations in Java, their relationships with staff, and contrasts with the older system of a village water master, in a situation where many farmers are

part-time cultivators. Kalshoven gives a review of farmer associations in Muda and Kemubu, Malaysia. Unfortunately, this goes only up to 1982, and contains little about their role in the rehabilitation of Muda, the Muda II programme. However, the discussion of these multipurpose organisations which are more concerned with provision of inputs than with water distribution provides basic background on their relationship to Malay social structure and government administration.

4. GROUNDWATER RESEARCH

Anthony Bottrall writes: A successful workshop on groundwater management was held at the Institute of Rural Management, (IRMA), Anand, India, 30 January to 1 February. The areas where thinking appears to have progressed furthest since the Ford Foundation began supporting research in this field are in the geographic area of the Eastern Gangetic plain in India and Bangladesh and in the thematic area of water markets. For the eastern region, evidence points strongly towards a strategy entailing (a) good hydrological/topographic mapping to differentiate those zones with high immediate potential for groundwater development from those requiring other measures (especially drainage) before they can be easily exploited; (b) intensive development of high-potential areas, largely through private investment and fostering competitive water markets; (c) concurrent efforts to improve energy supply (through better management of available electricity; reduction in diesel costs; improvement of pump installation, maintenance and repairs) and other incentives; and (d) efforts to improve the longer-term prospects of the region by effecting major changes in water resources policy and management and in the allocation of government investment with respect to surface canals, groundwater, rural energy and drainage.

The eastern region is likely to benefit particularly from the development of competitive water markets, but limited and erratic power supplies (and to a lesser degree, land tenure and other social factors) are major constraints to their more rapid expansion. Good work has been done by several economists on the workings of water markets in different parts of the sub-continent (Tushaar Shah, Shashi Kolavalli, Richard Palmer-Jones, M A S Mandal), but more comparative studies are still needed to understand better in what

circumstances they are likely to be most effective in promoting greater productivity and improving poor people's access, as well as where they may be less useful or even have negative effects on equity and sustainability.

More detailed, in-depth studies of the performance and management of public tubewells in eastern India are still needed (and are promised by the World Bank later this year); but the evidence from various papers presented at the workshop indicated that they have been much less efficient than private wells; and, though they are officially justified on equity grounds, small and marginal farmers rarely seem to have been the principal beneficiaries. The only strong case for public tubewell management lies in areas where heavy pumping is needed for drainage purposes (as in the head-reaches of many canal commands in eastern India) or where water quality is a problem (as in NW India and Pakistan). In areas with good quality aquifers but deeper water-tables, where private investment in shallow tubewells is impossible, larger capacity wells are indicated; but alternative forms of organisation need to be tried out and developed: either water users' groups, or third-party landless groups or 'Water companies' (such as are being experimented with in Bangladesh and in Gujarat).

The evidence on management by water users' groups, especially in eastern India, and wherever pump capacities and commands are relatively small and subject to competition or encroachment by others, suggested that - unless bolstered by external support, especially at the start - they were often subject to erosion of support and takeover by individuals or a few family members. Some degree of local monopoly, as is likely to occur in more water-scarce ares, may be a desirable (if not necessary) condition for their initial establishment and subsequent sustainability.

Appropriate and implementable policies for water-scarce hard rock areas are much more difficult to identify and advocate with confidence. In this region underground hydrological conditions vary tremendously from small location to small location. Ideally, therefore, policies for promoting productivity, equity and sustainability should be based on as good local hydrological knowledge as possible and be differentiated according to the specifics of each location. This implies decentralised planning, if possible on a community/watershed basis. But is that at all realistic, in terms of available technical knowledge and

administrative capacity? The overall scarcity of groundwater in the region also implies the need for a highly co-ordinated approach to surface and groundwater planning and development, at all levels from macro (river basin) to micro (watershed). The region is one where carefully designed legislation, redefining the rights of individuals, local communities, and local and State government bodies, could have an important role to play. To understand the multi-level interaction of the various important physical, technical, economic, social and legal factors better, a more widely encompassing framework of analysis is required than that used in most of the (predominantly single-discipline) micro-studies presented at the IRMA workshop. A regional workshop is being held at Tamil Nadu Agricultural University, 4-6 October to work on such a framework and identify key areas for further research.

The papers relating to the NW region and Pakistan showed there are very serious second-generation management problems to be tackled there (particularly relating to the management of poor-quality groundwater) which need closer study. Professor A C Gangwar of the Agricultural Economics Dept, Haryana Agricultural University, is keen to organise a regional workshop, which would also bring in people from Pakistan.

IRMA is bringing out an overview of the workshop shortly (write to Dr Tushaar Shah, its Director, for information (IRMA, PO Box 60, Anand 388 001, India). There should also be a set of proceedings from a subsequent workshop organised by the World Bank in Washington in May.

5. NEWS FROM IIMI

a. General

On 1 September, IIMI moves its headquarters to Colombo, Sri Lanka. Its new address will be 64 Lotus Road, Colombo 1. Letters should be addressed to PO Box 2075, Colombo, Sri Lanka.
IIMI is currently seeking for research programmes in Asia appropriately qualified civil engineers (Ref 302ML), agricultural economists (Ref 303ML), and an agricultural engineer (ref 304ML). For further information, write to the Director General at the address above. Brief details are held also at ODI.

In January IIMI began a collaborative programme with the Water and Power Consultancy Services, WAPCOS, a Government of India undertaking. The accent will be on research and training innovation. Initially IIMI is providing a half-time non-resident scientist for the exploration and identification of collaborative programmes with India's strong network of irrigation institutions.

The Programme Committee of IIMI's Board met in Kandy in March for one of its regular planning meetings. Concern was expressed over the way irrigation and water projects are branded by some lobbyists as environmentally dangerous. The Chairman of the Board, David Bell, said "The world population will probably double by the middle of the next century and as incomes grow, food demand is likely to more than double..... more and better irrigation will be crucial to food supplies in developing regions." He acknowledged that "There are conspicuous examples ... of irrigation projects that haven't been well designed or managed, where productivity is low, or where large areas have gone out of production altogether because of waterlogging or salinity. And there are some where public health hazards have come in behind irrigation. But these are planning or management shortcomings. With good management, good design, irrigation for sustainable agriculture is entirely feasible." The importance of IIMI's mission in this regard was also expressed by other Board members, including Robert McNamara, formerly World Bank President, Dr Kunio Takase of Japan, and Professor A A Abdalla of Sudan. Anyone who would like a copy of the full press release should write to IIMI at the above address.

IIMI publications

These are sent free to selected audience groups. They can also be ordered. The first price is for developed countries, the second for developing countries; postage is additional.

IIMI has a new Working Paper series that is intended to stimulate discussion and to make the results of recent research available as soon as possible, and to invite comments upon it. One thrust of its research is based on the hypothesis that an inflexible and unreliable supply in the primary or main canal negates the efforts of irrigation staff and of farmers below that level to achieve productive and equitable irrigation. Operational practices are often conditioned by the design features of the structures for water level control in the

main canal and discharge control at their off takes. Research on the impact of a design feature, such as a fixed duck-bill weir, cannot easily be carried out in the field, and has to depend on mathematical modelling. Those interested in the methodology and initial results should ask IIMI for:

Mathematical modelling of irrigation canal systems: International Irrigation Management Institute Working Papers No 9, by Daniel Berthery, Hilmy Sally and Jayantha Arumugam, and *Calibration of the Kirindi Oya RBMC mathematical flow simulation model: Description of the field measurement campaign and preliminary results, Working Paper No 10*, by Hilmy Sally, Daniel Berthery, Frederic Certain and Andre Durbec.

Public interventions in farmer managed irrigation systems, by Edward Martin and Robert Yoder (323 pp) presents papers from a conference held in Nepal in 1986. They concentrate on the important issue of how to assist farmer managed systems to become technically more efficient without undermining their management effectiveness. Case studies are mainly from Pakistan, The Philippines, Nepal, and some are already familiar. It is therefore good to see studies originating from Thailand, Morocco, and an interesting tank experiment in India. Also interesting is a paper by Sutaman on the Bali systems, famous as farmer managed, but recently subject to a rehabilitation which in some cases has had to be corrected later. This paper gives the story up to 1985; there is more to be written. The papers include a discussion of future research issues, focussing on the types of government intervention and their effects.

Other publications available from IIMI are:

Irrigation management for crop diversification in Indonesia, the Philippines and Sri Lanka: A synthesis of IIMI's research (124 pp), 1989, by Senen M Miranda, Colombo, Sri Lanka: International Irrigation Management Institute, US$12.50 (US$6 in developing countries).

Professional management in irrigation systems: A case study of performance control in Mahaweli System H, Sri Lanka, (120 pp), 1989, by Namika Raby and Douglas J Merrey, Colombo, Sri Lanka: International Irrigation Management Institute, US$12 (US$5.50 in developing countries).

Financing irrigation services: A literature review and selected case studies from Asia, edited by Edward Martin, (296 pp), 1989, Colombo, Sri Lanka: International Irrigation Management Institute, US$27.50 (US$12.50 in developing countries).

6. NEW PUBLICATIONS

a. Books

B D Dhawan (1988) *Irrigation in India's Agricultural Development: Productivity, Stability, Equity,* Indian Institute of Economic Growth, Studies in Economic Development and Planning No 44. New Delhi/London: Sage Publications.

Dr B D Dhawan examines the impact of irrigation on Indian agricultural production and performance. In the first two chapters, he points to the immense need for irrigation in India, and discusses multiple effects of irrigation, such as being able to use HYV seeds, extra seasons and more intensive methods. In Chapter 3 he presents his methodology for assessing the impact of irrigation. He describes how regression techniques can be used to estimate productivity by source of irrigation and the decomposition of agricultural income. He discusses the methodological problems in using crude agricultural output figures from "before" and "after" the installation of the system and the limitations of statistical data. He proposes an indicator of the stabilization effects of irrigation as a useful tool for evaluation. Chapter 3 is substantial, and contains examples and derived equations for practical consideration.

The rest of the book applies the various techniques discussed in Chapter 3 to examine the impact of irrigation on Indian agricultural development. He looks at issues of groundwater as against canal water, important changes in cropping patterns to enhance the productivity of irrigated lands, the stability impact of irrigation and at the question of access and inequality. He demonstrates the agricultural income increase in India which has been realised through irrigation, and points to further ways to increase production. He acknowledges his methods are least effective in identifying increases of income to the landless, although there is some evidence of downstream impacts of irrigation on generating employment for those who are not farmers.

There is very little overlap between Dr Dhawan's book and Robert Chambers' new book, *Managing Canal Irrigation: Practical Analysis from South Asia*, whose Indian edition was reviewed in the December 1988 issue. It is now also available from Cambridge University Press, UK, price £20 hardback and £6.95 paper back. *Troubled Water* by David Kinnersley, Hilary Shipman London 1988. Although primarily about water authorities responsible for domestic and industrial supplies and sewage, and also primarily about the UK, this book raises issues that may be relevant to those considering turning Irrigation Departments into companies supplying irrigation water.

Vector-borne Disease Control in Humans through Rice Agroecosystem Management, IRRI/PEEM, 1988, contains the proceedings of the workshop on *Research and Training Needs in the Field of Integrated Vector-Borne Disease Control in Riceland Agroecosystems of Developing Countries*, held in the Philippines 9-14 March 1987. It asks whether the increased prevalence of diseases such as malaria and Japanese encephalitis a necessary consequence of increased irrigation. The Workshop recommendations provide a framework for the interdisciplinary research needed on this subject and indicate that the concern now shared by both rice scientists and public health personnel may lead to improved rice cultural practices.

b. Reports and Manuals

PEEM III, IV, V, VI, WHO, Geneva 1987. Selected working papers from these meetings have now been published, covering methods of forecasting vector-borne disease implications in developing water projects, incorporating health and environmental safeguards in water projects, the environmental and health impact of population resettlement, and the financial and economic aspects of environmental management and its cost-effectiveness as a vector-control measure.

In a series of three papers, Dolores Koenig makes a comprehensive sociological analysis of the socio-economic, political and organisational aspects of forced population resettlement as a result of the Manantali dam project in Mali. It contains many useful points for similar projects elsewhere. The report argues that resettlement is seen more as a technical problem of rebuilding so the question of sustaining conditions of economic production is

overlooked. The hasty timing of resettlement, lack of settler participation in all phases of the project, and lack of land for longterm development of new communities are seen as the main shortcomings of this project. The reports are entitled *After the First Year's Move Trip Report*, February 1987; *The Second Campaign: Manantali Population Resettlement Project*, September 1987, and, co-authored by Michael M Horowitz, *Lessons of Manantali: A Preliminary Assessment of Involuntary Relocation in Mali*, from Clark University International Development Program, 950 Main Street, Worcester MA 01610, USA, or the Institute for Development Anthropology, 99 Collier Street, PO Box 2207, Binghamton NY 13902, USA.

Division Structures is a manual for senior agricultural staff designing or implementing smallholder irrigation schemes. It deals with orifice and weir intakes, giving descriptions of each, criteria for selection and design examples with detailed calculations. Published as part 5 in the Kenyan Ministry of Agriculture's series on small hydraulic structures, it is available from the Ministry of Agriculture, Irrigation and Drainage Branch, PO Box 30028 Nairobi, Kenya. A comprehensive design manual incorporating the whole series is planned.

GTZ has now published the English translation of *Management of Irrigation Systems - Guiding Principles*, by Walter Huppert and Hans H Walker in its Handbooks on Rural Development series. (See ODI-IIMI Newsletter December 1988.) It is available from GTZ-Verlagsgesellschaft mbH, Postfach 1164, D-6101 Rossdorf, West Germany.

Kampuchea: Undoing the Legacy of Pol Pot's Water Control System, by Bert Pijpers, provides a brief historical overview of the disastrous irrigation projects carried out under Pol Pot and the difficulties of repairing the damage today in the absence of western aid. Pol Pot's legacy of canals, dykes and structures unfortunately took little account of topography or soil conditions. This booklet has the merit of covering a little-known country and is available from Trocaire, Catholic Agency for World Development, 169 Booterstown Avenue, Blackrock, Co Dublin, Ireland.

In Operation and Maintenance of Small Irrigation Schemes, Peter H Stern outlines the points to watch out for to avoid problems with operation and maintenance; water supply, conveyance and

distribution; drainage; and water-borne disease. This practical booklet is published by Intermediate Technology Publications, 103/105 Southampton Row, London WC1B 4HH, UK, price £4.95.

Estimating the Economic Efficiency of Irrigation - the Case of Brazil (36/89 CP-BRA 37 SR, FAO, 10 March 1989). This working paper describes the methodology used for estimating present and future economic efficiency of irrigation in Brazil. The analysis is based on hectare budgets and farm modelling techniques, and includes a comparison with rainfed production costs. It is the first comparison of all major forms of irrigation in Brazil on a common base and should be of interest to specialists of Brazil as well as others, since it is anticipated that the methods will be replicable.

In *Manpower Planning for Irrigation*, Richard Carter and David Mason suggest a model for determining irrigation manpower levels. The stages of the procedure involve classifying the irrigation system, grouping activities into functions, defining job descriptions and designing an organogram. Typical job descriptions and organograms are presented with quantified examples for Indonesia, Nigeria, Sudan and Zimbabwe. Published by FAO, 1988.

Guidelines for Conducting Training Needs Assessments in Irrigation Management. J Stofkoper and J I Gianchandani argue that training needs assessments should be simple in design and not time-consuming if they are to be used regularly by trainers. The guidelines presented are aimed at staff developing or revising the content of training courses, and the manual concentrates on the questionnaire survey method. Available from Louis Berger International Inc, Water & Power Consultancy Services (India) Ltd, 213 Ansal Chambers-II, 6 Bhikaiji Cama Place, R K Puram, New Delhi 110066, India.

Vanishing Land and Water by Jean-Louis Chleq and Hughes Dupriez explains how erosion occurs and how to fight it, and gives instructions on building runoff barriers and small dams and on sinking wells and boreholes. Amply illustrated with photographs and diagrams, the book is based on experience in Burkina Faso and is aimed at farmers and rural craftsmen in semi-arid regions. This English translation from the French is published by Macmillan, and is also available from Terres et Vie, 13 rue Laurent Delvaux, 1400 Nivelles, Belgium.

The papers presented at the *International Conference on Irrigation System Evaluation and Water Management* (Wuhan University, 12-16 September 1988) have now been published in two volumes. They are available at US$50 plus $40 postage from Prof Lei Shenlong, Vice-Secretary General of ISEWM, Wuhan University of Hydraulic and Electric Engineering, Wuhan, China.

ISRIC: Aims, Programme & Activities. The International Soil Reference and Information Centre has just published an updated description of its activities. It is a useful resource for irrigation planners, serving as a documentation centre on land resources; and carrying out research, consultancies and training in aspects of soil classification and mapping, and agroclimatology. ISRIC, PO Box 353, 6700 AJ Wageningen, The Netherlands.

c. Journals

The Dominican Republic Takes the Lead by Herve Plusquellec in *The Bank's World*, Vol 8 No 3, March 1989. In the Dominican Republic, salinisation and poor canal maintenance have been solved in a pilot project by turning the management of irrigation systems over to Boards of small farmers. While in the Argentinean province of Mendoza, the administrative areas under decentralised small water user organizations have been enlarged to make them even more financially and administratively efficient. The reorganization of water users' associations in Mendoza, Argentina by Jorge Chambouleyron in Irrigation and Drainage Systems Vol 3 No 1, pp 81-94.

The January 1988 issue of the *ICID Bulletin* (Vol 37 No 1) contains two articles of special interest. J S Abbott reviews world wide usage of micro-irrigation comparing the results of the 1982 and 1986/87 ICID surveys (pp 1-12). Figures show the usage of micro-irrigation techniques has doubled in five years, and in addition to the leading Western countries and Israel, significant increases in the area under micro-irrigation are reported in Egypt, Brazil, Mexico, Jordan, China and Taiwan (all over 10,000 ha).

In the same journal, Asit K Biswas argues (pp 13-22) that too much emphasis has been placed in recent years on the use of systems analysis for water management problems. While models may be useful for operational purposes their value for policy making is negligible, and the problems dealt with are often far too theoretical.

For optimum results, systems analysis should be considered along with other approaches.

Wamana Journal. The January 1989 issue contains two articles by Niranjan Pant and Tushaar Shah dealing with ground water development in eastern Uttar Pradesh and in Gujarat respectively, also covering user group management of tubewells. The April 1989 issue features water management in Punjab and Haryana by S P Malhotra and examines implementation of the Warabandi system. It describes Warimetric, an innovative method for assessing water charges on the basis of the number of turns a farmer receives his share of water.

7. CONFERENCES

The papers of a conference on planning to suit the local socio-economic environment, held by DVWK in Berlin in April, are available. They contain both theoretical frameworks and practical observations, the former making them perhaps of most interest to researchers and teachers. The title is *Situation-specific management in irrigation*, published by Paul Parey, Hamburg/Berlin, 1989.

The triennial international conference, World Water 89, will be staged at the Wembley Conference & Exhibition Centre in London from 14-16 November 1989. Details are available from World Water 89, Westrade 89, Westrade Fairs Limited, 28 Church Street, Rickmansworth, Hertfordshire WD3 1DD, UK.

Southampton University will be holding an international conference on *Irrigation: Theory and Practice* on 13-15 September 1989. Details available from Institute of Irrigation Studies, The University, Southampton, SO9 5NH, UK.

There will be a symposium on *Land Drainage for Salinity Control in Arid and Semi-Arid Regions* from 26 February - 3 March 1990, to be held in Cairo, Egypt. Further details from Drainage Research Institute (DRI), Irrigation Building, 13 Giza Street, El Giza, Cairo, Egypt.

8. TRAINING COURSES

The following have been notified to us:

a. Short courses

Dept of Agricultural Engineering, College of Engineering, University of Wyoming, PO Box 3295, Laramie, Wyoming, USA. 14-31 August: *Automatic Operation of Irrigation Canals.*

International Irrigation Centre, Utah State University, Logan, Utah, USA. 20 August-23 September: *Soil and Water Conservation and Management.* 27 August-16 September: *Farmer Participation and Irrigation Organization.* 27 August-30 September: *Design of Wells and Pumps for Irrigation.* 6-23 September: *Soil Conservation & Management Study Tour of US Mid-Western States* (English and Spanish). 1-21 October: *Maintenance of Pumping System Components.* 1 October-11 November: *Operation, Maintenance and Management of Irrigation Delivery Systems.* 19 November-2 December: *Financial Management of Irrigation Systems.* 3-16 December: *Workshop on Policy, Planning and Strategies for Irrigated Agriculture.*

International Rice Research Institute, PO Box 933, Manila, Philippines. 28 August-6 October: *Irrigation Water Management Training Course.*

Iav Hassan II - Centre International de L'Irrigation, BP 6202, Rabats-Instituts, Rabat, Morocco. 3 September-7 October: *Irrigation Systems Management.*

DCTP/UNDP, 5th Floor, Bonifacio Building, University of Life Campus, Meralco Avenue, Pasig, Metro Manila, Philippines. 4-22 September: *Planning and Management of Training Programs.*

Colorado Institute for Irrigation Management, Colorado State University, Fort Collins CO 80523, USA. 4-29 September: *Monitoring, Evaluation, Feedback and Management of Irrigated Agricultural Systems.* 2-27 October: *Remote Sensing, Image Processing and Geographical Information Systems: Applications in Irrigated and Agricultural Farming Systems.* 16 October-3 November: *Training of Trainers for Irrigation Management.* 6-24

November: *Wate Users' Associations in Irrigation Management.* 27 November-22 December: *Irrigation Systems Rehabiiitation.*

b. Academic courses

International Agricultural Centre, PO Box 88, 6700 AB Wageningen, The Netherlands. 20 August-1 December 1989: *Postgraduate Course on Land Drainage.*

9. ACTIVITIES AT ODI

We have decided to launch a new AAU series of INTER NETWORK PAPERS, which are on topics that we feel may be of interest to members of more than one AAU Network. The first of these is by Gaie Mendelssohn, *The use of micro computers for project planning, monitoring and evaluation*, AAU Inter Network Paper 12, March 1989. It looks at specific tasks in the project cycle that can be performed more efficiently with the use of a computer and standard softwares for word-processing, a spreadsheet, and database management. The author worked in the agricultural planning unit of a small Caribbean island; it concerns the type of planning work which in larger countries would be done at District or Province level, and should be helpful to all those who want to take the first steps in developing computer use.

We have been fortunate in having a series of interesting lunch time meetings this year at ODI:

Wednesday 11 January 1989, a Discussion Meeting on *Irrigation charges in the Barind Integrated Area Development Project: A New Approach*, by Mr M Asaduzzaman of the Bangladesh Agricultural Development Corporation. Mr Asaduzzaman plans to develop this into a Network Paper.

Friday 9 June 1989, a Lunch Time Meeting on *Improvement of operation in Nong Wai Pioneer Agriculture Project, Thailand*, by Mr G N Kathpalia, Consultant. Mr Kathpalia reported on a return visit to this project, which he described in Network Paper 10c, 1984.

Monday 19 June 1989, a Lunch Time Meeting on *Problems and successes in introducing drip irrigation to arid areas with particular reference to Tamil Nadu*, by Prof R K Sivanappan, former Director

of the Water Technology Centre at Tamil Nadu Agricultural University, Coimbatore. Although drip irrigation is never likely to extend to more than 1% of India's irrigated area, it is particularly useful for high value crops in water scarce areas. Professor Sivanappan described simple systems that have been developed for small farms.

Friday 14 July, a Lunch Time Meeting on *Performance evaluation of irrigation tanks in South India*, by Dr K Palanisami, Agricultural Economist at the Water Technology Centre of Tamil Nadu Agricultural University. This may later appear as a Network Paper.

Mary Tiffen

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