

Presentation on the Strategy Theme “Systems”

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Abstract

The paper presents a review of the ICID's activities in the “systems” strategy theme and recommendations regarding new emphases in these activities. Developments by the ICID working groups currently allocated to this strategy theme are analysed as far as consolidation of tasks, and rationalisation of work bodies are concerned.

Specific proposals submitted for consideration are :

- Working Group on Drainage: The mandate and activities schedule of this Group be revised to also provide for the drainage problems by small-scale African farmers.
- Working Group on Integrated Land and Water Management: Expansion of the activity plan to include i.a. provision for value systems of affected communities; institutional requirements; public participation; resource management structure; implementation strategies; and auditing procedures.
- Working Group on Development and Management of Irrigation Systems: Adding to the current activity plan the additional dimension of small-scale irrigation in Africa especially concerning crop irrigation requirements and water supply management. These additions are due to the unique characteristics of irrigation in this part of the world.
- Gender issues in irrigated agriculture: Since the role of women cuts across the activities of all the ICID Working Groups, joint ventures on an inter-strategy theme level are proposed. Promotion of empowerment regarding sustainable resource use; training and skills development; equipment and technology; and institutional framework and capacity, is identified as a thrust that needs to be attended to by a number of ICID Working Groups.

Résumé

L'article fait un bilan des activités d'une CIID en matière de stratégie des 'systemes' et propose des recommandations en ce qui concerne les nouvelles priorités dans ces activités. Les progrès accomplis par les groupes de travail des CIID actuellement assignés à ce thème de stratégie sont analysés en ce qui concerne la consolidation des tâches et la rationalisation des corps de travail.

Les propositions spécifiques soumises à l'examen sont :

- Groupe de Travail sur le Drainage: Le mandat et le programme des activités de ce groupe doivent être modifiés pour faire face aux problèmes de drainage rencontrés par les petits fermiers africains.
- Groupe de Travail sur la Gestion Intégrée de la Terre et de l'Eau: Elargissement du plan d'activités pour inclure, entre autres, des dispositions à prendre en ce qui concerne les

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systèmes de valeur des communautés affectées; les critères institutionnelles; la participation publique; la structure de gestion des ressources; les stratégies de mise en application; et les procédures d'audit.

- Groupe de Travail sur le Développement et la Gestion des systèmes d'irrigation: Ajouter au programme d'activités actuel la dimension supplémentaire de l'irrigation sur une petite échelle en Afrique, spécialement en ce qui concerne les exigences de l'irrigation des cultures agricoles et la gestion de l'approvisionnement en eau. Ces ajouts se justifient en raison des particularités de l'irrigation dans cette partie du monde.
- Les Problèmes des femmes dans un système d'agriculture irriguée: Étant donné que le rôle des femmes dépasse les activités de tous les groupes de travail, des joint-ventures sont proposées au niveau d'un thème de relation entre stratégies. L'encouragement à donner des pouvoirs aux femmes en matière de l'utilisation des ressources renouvelables; la formation et le développement des compétences; l'équipement et la technologie; ainsi que le cadre et la capacité institutionnels, constituent l'orientation à laquelle doivent prêter attention un nombre des Groupes de Travail des CIID.

Introduction

At the 45th meeting of the IEC in Varna in 1994, the Work Team on Objectives and Strategies recommended to the Permanent Committee for Technical Activities (PCTA) that the technical activities of the ICID be developed in four areas, namely

- Policy
- Systems (irrigation, drainage and flood control systems)
- On-farm
- Research and Technology Dissemination (Capacity Building)

This recommendation was supported by the PCTA and approved by the IEC.

Theme leaders were appointed for each of these strategy areas, each with the responsibility to co-ordinate the activities of the existing Working Groups in his strategy area. Furthermore it was decided to initiate broader discussion on the strategy area through an appropriate presentation at IEC meetings on a rotational basis. In terms of this decision the following presentations have been made up to now :

- 1995 : Research and Technology Dissemination
- 1996 : Policy
- 1997 : On-Farm

Unfortunately time did not allow a presentation at the 1998 IEC meeting. My presentation today is an endeavour to give you an overview of the "systems" strategy theme. The intentions of this and previous overviews are basically the following :

- To suggest to PCTA new items of work that may be taken up by the existing work bodies, and the time that will be needed to complete the work.
- Where applicable, to suggest formation of new Working Groups to study uncovered aspects relating to a specific strategy area.

- To make recommendations to PCTA regarding inter Working Group collaboration as far as aspects requiring joint ventures are concerned, and to facilitate broader discussion in PCTA and in the IEC on the above-mentioned issues.

The above is to form the framework for my presentation on the “systems” strategy theme.

Current ICID Working Groups Assigned to the “Systems” Strategy Theme

As is indicated in item 4.5 of the Agenda of PCTA’s nineteenth meeting here in Granada, the following Working Groups are considered to be included in the “systems” strategy theme :

- Working Group on Integrated Land and Water Resources Management.
- Working Group on Drainage.
- Working Group on Development and Management of Irrigation Schemes.
- Working Group on Irrigation and Drainage Performance.

Studying and evaluating the performance of these Working Groups and the extent of their activities (as reflected in the respective agendas for their meetings here in Granada), a number of important and directional conclusions may be drawn. Before dwelling on these conclusions, I think it is necessary that we briefly review the approach of utilising a Working Group or a Work Team for specific themes or tasks respectively.

In order to achieve its general objectives of developing and promoting guidelines and best practices for sustainable irrigated agriculture to enhance food and fibre production for an increasing global population, ICID relies heavily on these work bodies. Subjects of current global importance are selected on a priority basis, and then mandated to specialised Working Groups or Work Teams for carrying out the work in that subject with the help of elected members from different regions of the world. These members are recognised specialists in areas related to the activities of their respective work bodies and are, therefore, collectively in a position to make substantial and significant contributions to the activities of a work body in a co-ordinated and proactive manner. I wish to assure these members of the unqualified appreciation of the irrigation community at large for their inputs without which ICID’s achievements would not have reached the heights which established it as the recognised irrigation organisation in the world.

Back to the conclusions on the current Work Bodies. I think these conclusions can be summarised as follows :

1. Scope of activities

Careful analysis of the current and completed tasks of the various Working Groups reveals an impressive and comprehensive list of activities which, in all cases, addresses all the facets of the respective mandates. For the four Working Groups currently included in this strategy theme and with the mandates as

formulated, I see no need to propose new items of work for inclusion in their respective list of activities. During the past year a number of developments regarding co-ordination and amalgamation of activities took place and resulted in a number of new views which will be attended to in revised activity plans. I shall be coming back to these later in this presentation.

2. Overlap in the fields of interest

Comparison of the mandates and the implied fields of interest of the Working Groups not only within the same strategy theme, but also between the various strategy themes, reveals a number of fields of interest of importance to more than one strategy theme. Duplication of attention resulting from a field of interest being of importance to more than one strategy theme, needs not necessarily be a reason for grave concern since not all duplication is unnecessary and manpower wasting. Attending to the same field of interest, but from different perspectives, very often is a very necessary and productive approach to a problem. This approach, however, is subject to a very important condition, i.e. co-ordination. It is the task of the various theme leaders and Working Group chairpersons, when these fields of common interest to more than one strategy theme have been identified, to establish acceptable lines of communication and co-ordination in order to ensure no unnecessary duplication of activities. This is essential in the interest of the Working Groups involved, and also from the point of view of the ICID as an organisation since it will ensure most productive utilisation of all energies at its disposal.

3. Consolidation in the activities of the current Working Groups

Scrutiny of the agendas of the various Working Groups for their meetings in Granada clearly indicates what I would like to call a "state of consolidation", after a period during which a number of important transformations took place. The following should confirm this point of view:

- *Working Group on Integrated Land and Water Resources Management* :
 - At Bali the name of this Working Group was changed from Working Group on Decision Systems for Water and Land Management, to Working Group on Integrated Land and Water Resources Management.
 - A modified mandate and new work plan for up to 2003 were considered and finalised in Bali.
 - A number of activities in various stages of completion are to be completed, whilst a number of new activities are to be embarked upon, e.g. integrated land and water resource management in transboundary basins.
 - In the latter case, as well as for the review of decision-making tools and methods, collaboration with a number of other Working Groups is to be initiated.

- *Working Group on Drainage:*
 - Implementation of the recommendations of the Penang Workshop.
 - Although the current activities of this Working Group are planned to be concluded during the period 2000 - 2001, consideration is being given to inclusion of the impacts of drainage on groundwater contamination, biodiversity and landscape.
 - After an existence of 16 years and the identification of new activities, a new mandate and conversion to a committee need to be investigated.
- *Working Group on Development and Management of Irrigation Systems*
 - Implementation of decisions taken at Oxford e.g.
 - Merging of the Working Group on Construction, Rehabilitation and Modernization of Irrigation Projects and the Working Group on Operation, Maintenance and Management of Irrigation and Drainage Projects.
 - Development and acceptance of a new mandate and new rolling-plan.
 - Service oriented management, systems sustainability, improved service delivery and financial management are to be considered for inclusion in the list of activities.
 - Co-operation with the Work Team on Socio-economic Impacts and Policy Issues and the Working Group on Irrigation and Drainage performance is to be amplified.
- *Working Group on Irrigation and Drainage Performance*
 - Conclusion of a number of activities in various stages of completion.
 - Identification of new tasks.
 - Closer co-operation with e.g. the Working Group on Development and Management of Irrigation Systems and the Working Group on On-Farm Irrigation Systems.

I think you will agree that these observations confirm that consolidation is taking place in the activities of this strategy theme. This consolidation, necessary as it is at this stage, however, does not preclude careful consideration of future activities. The latter is essential if the ICID is to remain a dynamic organisation which is proactive in its undertakings.

4. Rationalisation of Work Bodies

On various occasions PCTA and the IEC expressed concern and through their decisions indicated that proliferation of Work Bodies needs to be limited in order

to ensure manageability of the ICID's activities. In addition to the consolidation referred to above (which is mainly dealing with mandates and work plans and their integration and co-ordination), we have the implied further development of rationalisation of Work Bodies. As could be expected, it is very difficult to decide exactly when to consider the activities of an existing Work Body to have terminated, since one activity inevitably leads to another related activity thereby extending the productive life span of that Work Body. Against this background I consider mergence of Work Bodies, resulting in the termination of one and temporarily expanding the field of another, an ideal vehicle to achieve rationalisation without losing impact.

All in all, therefore, I think you will agree that, the current state of affairs of the "systems" strategy theme is healthy, and that the anticipated actions regarding mergence and consequent rationalisation are in the interest of the theme and will contribute to streamlining the activities of the ICID in general.

THE FUTURE

Having given the overview as summarised in the previous paragraphs, I now wish to address the other facets of the brief to theme leaders, utilising the following headings:

1. Joint ventures with other ICID Work Bodies

As far as this heading is concerned, I wish to submit the following for consideration :

(1) *Working Group on Irrigation and Drainage Performance*

Over the years the products of this Working Group in no uncertain way contributed significantly to the design, management and evaluation of irrigation and drainage systems. From the Group's list of activities as was tabled here in Granada, it would appear that a tapering off of activities is expected. However, nobody can categorically confirm that there will be no further need for investigations on irrigation and drainage performance. My proposal, therefore, is that should the activities of this group be concluded, the mandates of the Working Group on Drainage and of the Working on On-Farm Irrigation Systems be extended to provide for future investigations regarding performance norms for drainage, mechanised and micro-irrigation systems, should there be a need for investigations of this nature. In effect this approach amounts to a joint venture with the difference that the one partner will be participating through the products it generated when still a Working Group in its own right.

(2) *Working Group on Drainage*

In addition to the inclusion of drainage performance as part of its brief, the mandate of this Working Group also needs to be revised to provide for the recommendations as presented in the Penang Statement. I consider this to be of such importance that I wish to quote the following from the Penang Statement :

“Sound drainage practices can achieve substantial increases in land productivity, ensure bio-diversity protection and provide for a proper quality of drained water flowing to the downstream system. As irrigated and rainfed agricultural production is intensified, drainage will become critical for sustainability of the system. Provision of extensive drainage infrastructure, surface as well as subsurface, in conformity with the local requirements along with its effective operation and maintenance through participation of the beneficiaries, will be the key to success in sustainable agricultural production. The likely effects of climate change also will have to be kept in mind. Global attention will have to be focussed on these requirements.

“For this purpose watertable management, controlled drainage, flood mitigation, reuse of drainage and wastewater will have to be given closer attention. Comprehensive management plans must be developed for different areas on a scientific basis and backed by adequate legal provisions. Capacity building measures including development of expertise for handling the complex soil-water-plant relationship and drainage extension services to farmers are urgently required. Extensive networks for continuous monitoring of the groundwatertable and soil environment near plant root zones will have to be instituted early. Towards these objectives, necessary institutional reforms must be undertaken.”

I am of the opinion that these recommendations excellently encapsulate the road ahead for drainage of agricultural lands, and therefore, fulfil the role of a guideline in the reformulation of this Working Group’s mandate. Being from Africa, though, I think it is essential that drainage, on and off the farm, from the point of view of the small-scale African farmer active in that part of the continent south of the Sahara, be given special attention when revising the mandate and activities schedule of the Drainage Working Group.

(3) *Working Group on Integrated Land and Water Management*

As was indicated earlier this Working Group revised their mandate and Work Plan in view of newly identified needs. It is clear that integrated management of land and water resources features prominently in the formulation of future activities.

In the latter regard I wish to contribute the following :

As an introduction: Integrated land and water management is simultaneously a philosophy, a process and an implementation strategy aimed at :

- achieving a sustainable balance between utilisation and protection of all environmental resources relevant to productive irrigated agriculture in a clearly confined geographical area; and at
- growing a sustainable society through stakeholder, community and government partnerships in the management process.

The intimate connection between water resources, land use and drainage return flow dictates that, for development of these to be sustainable, their management need to be integrated. The basic need that a people-friendly scale should underlie people-oriented water and land management, requires that such integration should primarily occur at a localised geographical area. The inter connectivity of hydrology, land-use and aquatic ecology across scales above that of localised geographical areas, adds a wider facet to the need for integration of water and land management. These wider facets provide a coherent series of inter-linked building blocks designed to support strategic water and land resource management imperatives that have to operate at scales across localised boundaries, but that will still ensure sustainability.

Achievement of this ideal of sustainability depends not only on appropriate institutional management structures. Streamlined inter-relationships between all environmental management components are required, which is as much a process of education and human development than a legally prescribed procedure. Timely establishment of flexible and dynamic management structures will facilitate the process of achieving sustainability.

When guidelines for integrated land and water management are proposed, it should be done with a long-term view, but with the necessary practical and immediate elements included, thereby ensuring that these guidelines are feasible in the short term. This will also enable implementation of integrated land and water management in the medium and longer terms.

Guidelines for possible components of the integrated land and water resource management process, and which will have to be considered in the development and formulation of this facet of this Working Group's activity plan, are i.a. the following :

- Provision for the spiritual, ethical, social, economic and environmental value systems of the communities involved in integrated land and water resource management, and addressing their needs and desires, in the context of sustainable resource management and use.
- The most suitable scale (immediate and future) on which the integrated land and water resource management activities are to be initiated.
- Institutional requirements concerning the implementation of the integrated resource management process.
- Development and implementation of processes to ensure stakeholder and general public participation in all the facets of integrated resource management.
- Establishment of approaches to mentor and facilitate the initiation phase of the resource management process, aimed at assisting stakeholders with scoping, problem identification and issue prioritisation.

- Determining the most suitable resource management structure in order to provide for all the relevant stakeholders, regulatory authorities and statutory agencies, yet balancing the requirement for representativeness with the need for effective resource management.
- Identification of the costs involved to ensure the sustainability of the land and water resources (i.e. infrastructure, resource management and resource conservation), and funding procedures for these costs.
- Promoting an understanding of the administrative, socio-economic and physical environments associated with land and water resources, and development of cost-effective assessment procedures, including data and information gathering, collation, storage, quantification, interpretation and assessment.
- Planning the key resource management issues, providing for integrated decision-making based on a holistic view of the various contributing elements.
- Development of implementation strategies, translated into a programme of implementable actions for each of the affected groups involved in a particular resource management undertaking.
- Devising ways and means of auditing the effectiveness, relevance, implementation and administration of a resource management plan in order to determine the need for revision.

From the above it is very obvious that viable and feasible approaches to the development of effective integrated management plans for land and water require joint ventures involving other Working Groups in addition to the Working Group on Integrated Land and Water Management. In this regard I am thinking of the following :

- Working Group on Environmental Impacts of Irrigation, Drainage and Flood Control Projects.
- Working Group on Drainage.
- Working Group on Development and Management of Irrigation Systems.
- Work Team on Use of Poor Quality Waters for Irrigation.
- Work Team on Socio-economic Impacts and Policy Issues.

(4) *Working Group on Development and Management of Irrigation Systems*

Again from the point of view of joint ventures with other Working Groups, it is necessary that possibilities for co-operation with the Working Group on On-Farm Irrigation Systems always be kept in mind. In Oxford in his presentation on the “on-farm systems” strategy theme, Prof Luis Pereira gave an excellent overview of various on-farm issues emphasizing i.a. on-farm irrigation design (including traditional surface irrigation); environmental impacts assessment; and relationships between on- and

off-farm systems. I wish to support Prof Pereira on all the issues he identified, but especially as far as the relationships between on- and off-farm systems are concerned.

However, regarding on-farm irrigation design and relationships between on- and off-farm systems, I wish to add an additional dimension, namely considering both of these issues from the small-scale irrigation farmer point of view, and more specifically within the context of small-scale irrigation in Africa south of the Sahara. Irrigation in this part of the world has a number of unique characteristics and is being practised under conditions so dissimilar to that of other parts of the world that it almost warrants a Working Group concentrating on these issues. Allow me to highlight two specific facets. At the same time I will also indicate where these facets lend themselves for co-operation with Prof Pereira's theme and the Working Group on Development and Management of Irrigation Systems.

- *Crop irrigation requirements*

I realise mentioning this issue to this audience will raise a few if not most eyebrows. But let us look at the problem from the angle of the small-scale irrigation farmer. When planning and designing storage, conveyance works and on-farm irrigation equipment, estimation procedures are being applied which relate to the water requirements of the crop when it is achieving full yield potential. In most small-farmer situations, however, the crop is not managed to achieve full yield potential. This is due to the fact that most small-scale farmers are risk averse. They have to take into account the cost of the inputs required to achieve full yield, and the danger of losing this investment if something goes wrong. Consequently they seldom aim for high yield levels and instead adopt a conservative approach to promote sustainability. In the long term this approach results in relatively low planting densities and fertiliser applications lower than that of conventional irrigation practices. Eventually the canopy may not cover 100% of the land surface and approximates to the canopy of a good rainfed crop, rather than that of a conventional irrigated crop. The nett result is a yield that, though less than maximum, is still high, but irrigation requirements per unit area significantly less than those presently used in estimations of sustainability.

Since so many make-or-break decisions can depend on these estimations, especially in the planning or re-planning of small-scale irrigation setups, it is essential that this approach be given the attention of the relevant Working Group. I also see a connection with the activities of the proposed Working Group on Socio-economic Impacts and Policy Issues, and, therefore, a joint venture in this regard.

- *Water supply management for small-scale irrigation enterprises*

In addition to water requirements, management of water delivery to an

irrigation enterprise for small-scale farmers very often turns out to be the key to project failure, and without effective management sustainable irrigation is unattainable. Innovative thinking is essential if the assets of infrastructure, natural resources and experience are to be gainfully exploited. Improved reliability and flexibility of water deliveries result in both improved on-farm use and less spillage and loss in the conveyance system. These factors decrease the volume of water required at the source for the same crop yield even though the water supply is available on a more flexible basis to the small-scale farmers involved.

Developing shared water supply for small-scale farmer managed irrigation enterprises, the challenge lies in designing a system which :

- allows easy, sustainable management of equitable water distribution, especially during periods of drought;
- provides for manageable water payment arrangements and reliable water measurement, should the payment system render measurement unavoidable;
- judiciously balances development costs with running and maintenance costs, according to financial and operational circumstances, while keeping overall costs as low as possible to increase viability; and
- achieves attainable maintenance requirements and minimal dependance on technical support services.

In cases where there is a lack of credit or initial cash for construction and maintenance, water delivery systems are to be designed for the eventual implementation of more economical components. With an improvement in the financial situation as a result of the irrigation development together with an improvement in the logistical support, the water delivery system can be altered but then only when the original design provided for such future alterations. Too often the classical economical analysis, supporting low initial costs and high operation and maintenance budgets, formed the background for irrigation projects under developing conditions not being sustainable.

Clearly the preceding comments on water supply and its management, with specific reference to small-scale irrigated agriculture, point to the provision of an extensive set of guidelines in this regard. The development of these guidelines is an activity which, to my mind, falls with the field of responsibility of the Working Group on Development and Management of Irrigation Systems. In collaboration with the On-farm Working Group and the new Socio-economic Working Group an end-product on management of water supply can be generated that will have wide application potential, not only in Africa but also in other parts of the developing world.

(5) *Role of women in sustainable irrigation*

Earlier in this presentation reference was made to the recommendation that gender issues in irrigation be incorporated in the new Working Group

on Socio-economic Impacts and Policy Issues. In principle I have no problem whatsoever with this proposal. Although this development most probably implies that gender issues form part of the responsibility of the "Policy" strategy theme, I trust you will allow me a number of comments in this regard.

As was pointed out at previous occasions, the role of women is a facet which cuts across all the Working Groups currently employed by the ICID to achieve its objectives. When we come to food security, however, the role of women may not be under-estimated. Very often circumstances may dictate extensive and expensive redevelopment, aimed at a new commodity enterprise or at the low-cost conversion of an irrigation enterprise. Conventional engineering design norms and specifications should not be accepted without detailed consideration of what is appropriate for the circumstances. The community, and particularly the women, should be in the picture throughout and should be involved, from design through construction to implementation. This implies participatory irrigation planning, including Participatory Rural Appraisal (PRA) type of interviews, with representatives of communities (particularly women) in order to establish the extent of their involvement in irrigation and to assess their experience and ability.

In addition to the above, women need to be empowered to play more prominent roles in the following regards :

- *Sustainable resource use* :
 - Access to land and water.
 - Women's economic contribution and participation.
 - Health aspects and reproductive capacity.
- *Training and skills development* :
 - Extension activities.
 - Engineering and administrative support.
 - Institutional capacity building.
 - Access to all levels of training.
- *Equipment and technology* :
 - Gender appropriate technology.
 - Crop selection.
 - Post-harvest and marketing activities.
 - Empowerment to use technology.

- *Institutional framework and capacity :*
 - Constitutional and legal framework.
 - Institutions at grassroots level and their interactions.
 - Financing mechanisms.
 - Participation of women in decision-making.

For your information I wish to mention that the above issues are to be addressed in an international workshop which the South African National Committee is organising for October 2000 in South Africa. In line with our National Committee's vision the theme "The role of women in poverty alleviation through sustainable irrigation" will concentrate on gender issues in the African context, but I am convinced the event will generate insights and even guidelines of value not only to irrigation in Africa, but all parts of the world.

Approaching the issue of women in irrigation along the above lines, I think you will agree it calls for joint ventures not only within the "Policy" strategy theme, but also on an inter-strategy theme level. Examples in this regard are :

- Working Group on Capacity Building, Training and Education.
- Working Group on Development and Management of Irrigation Systems.
- Working Group on Socio-economic Impacts and Policy Issues.

CONCLUSION

As indicated in the beginning, with this presentation I endeavoured to address issues that relate to the "Systems" strategy theme. I provided a review of the current state of affairs and pointed out where extensions will have to take place in view of the dynamic changes being contemplated by the IEC. I wish to conclude with the statement that however positive all these developments are, it must never result in complacency. For that our world has too many water related problems. We must always strive to make our contributions to the best of our abilities: concertedly, intensively and proactively.

Thank you for your kind attention.