

**WORKING GROUP ON  
MODERNIZATION AND REVITALISATION OF IRRIGATION SCHEMES (WG-M&R)**

**UPDATED SCOPING DOCUMENT**

## **1. Introduction**

- 1.1 Water scarcity and the resulting need for its efficient use is a global challenge. In some countries there are also increasing land use intensification impacts on water quality driven by irrigation. The investment in irrigation systems is considerable. For example in a modern agricultural context the irrigation system investment behind the farm gate is frequently greater than the water storage and distribution infrastructure. Ensuring that irrigation schemes are designed, installed, managed and maintained well is essential if production gains, subsequent direct, indirect and induced economic benefits are to be realised, all whilst managing direct and indirect environmental impacts. It may be expected that in the coming period most of the activities in irrigation will be in the field of modernisation and enhancement of existing schemes. For a certain number of schemes revitalisation will be required, before modernisation activities can be undertaken, or such activities may be undertaken in combination. The revitalisation concerns the broader policy and strategy aspects of Governments with respect to actual activities with respect to the modernization of irrigation schemes.
- 1.2 Despite these socio-economic and environmental drivers there are no internationally accepted standards and associated codes of practice associated with irrigation design, installation and evaluation. To address this there is an urgent need for their development. This will provide a bottom-line for future irrigation development internationally.
- 1.3 With respect to these activities broadly speaking the following aspects are of major importance:
- (a) interaction between modernisation or revitalisation and resulting required operation and maintenance;
  - (b) cost sharing for modernisation or revitalisation and resulting required operation and maintenance;
  - (c) how to handle political, economic, social and environmental aspects;
  - (d) institutional and organisational arrangements for modernisation or revitalisation and resulting required operation and maintenance;
  - (e) people that operate, maintain and manage the schemes;
  - (f) codes of practice and standards.
- 1.4 In this Updated Scoping Document the relevant aspects of each of these items will be reviewed and the objectives, state of knowledge on the topic and the Workplan will be presented.

## **2. Objectives**

### *2.1 Relevance of the Working Group*

2.1.1 The relevance of the WG can be specified as follows:

- (a) the topic of modernization and revitalisation of irrigation schemes is relevant to the vision and mission of ICID and of interest for its members, especially in countries with a high, medium and low Human Development Index<sup>1</sup>;
- (b) the WG is expected to contribute to effective implementation of the Strategy Theme Schemes and to other strategy themes for that matter;
- (c) it may be expected that in the coming period most of the activities in irrigation will be in the field of modernisation of existing schemes.

### *2.2 Relevance of the Working Group to the scope of the Thematic Area*

2.2.1 For the relevance of the WG to the scope of the Thematic Area the same argumentation is applicable as shown under the relevance. Most of the activities in irrigation will be in the field of modernisation of existing schemes. For certain schemes, especially in the countries with a high, medium or low Human Development

<sup>1</sup> Low Human Development Index. Most of the countries in Africa, several countries in Asia, one country in Central America and most of the smaller countries in Oceania;

Medium and High Human Development Index. Most of the Eastern European countries (including Russia), most of the countries in Central and South America and in Asia (including China, India, Indonesia and Pakistan) and several countries in Africa;

Very High Human Development Index. Most of the countries in Western and Central Europe, North America and some countries in Central and South America and in Asia, the larger countries in Oceania and one country in Africa.

Index revitalisation may be required before modernization activities can be undertaken. This concerns the technical, institutional and environmental aspects.

### 2.3 *Existing gap that the Working Group is expected to fill*

2.3.1 Other ICID WGs or Task Forces (TF) that have a related scope of work are: WG-ENV, WG-SDTA, WG-DROUGHT, WG-CLIMATE, TF-VE, WG-ON-FARM.

2.3.2 While WG-ON-FARM is mandated to study efficient application of water at the field level, there is a gap in dealing with issues related to delivery of irrigation water upto farm level. None of the WGs are presently mandated to study the issues related to irrigation efficiencies and the way to improve them.

2.3.3 The new WG has taken good note of the activities of these Workbodies when preparing this Updated Scoping Document.

## 3. **State of knowledge on the topic**

### 3.1 *Other International Organisations that are working on the subject*

3.1.1 There are several other International Organisations that have programs and activities on this topic. This especially concerns the:

- (a) Food and Agriculture Organisation of the United Nations (FAO);
- (b) Most of the 15 research institutes that are organised within the CGIAR Consortium, especially IWMI and ICARDA;
- (c) Other research institutes: International Centre for Agriculture (ICBA);
- (d) International Fund for Agricultural Development (IFAD);
- (e) Several of the 11 professional water associations, especially: International Commission on Large Dams (ICOLD) and International Hydropower Association (IHA);
- (f) Multilateral development banks: Asian Development Bank (ADB), African Development Bank (AFDB), Inter-American Development Bank (IADB), World Bank (WB);
- (g) International partnerships: World Water Council (WWC);
- (h) Universities and institutes for international education: Asian Institute of Technology (AIT), Irrigation Training and Research Centre of California Polytechnic State University, McGill University, UNESCO-IHE.

### 3.2 *Mandate of the Working Group*

3.2.1 Mandate of the Working Group is based on the specific niche that this WG can fill in this area and can be formulated as follows:

- (a) exchange of information, knowledge and experience, as well as networking on the topic in order to be up to date with new developments, methods and approaches. This can be the basis to present recommendations and if mature a position paper on key issues on modernization of irrigation schemes;
- (b) review and prepare a condensed overview of existing key books, manuals, guidelines and other relevant publications on the topic;
- (c) prepare and present reports and/or case studies on recent development in the countries that are represented in the WG;
- (d) to collect and review manuals, guidelines, codes of practice and standards on modernization and revitalisation of irrigation schemes in the countries that are represented in the WG;
- (e) to organise international workshops, seminars or symposia on the topic;
- (f) to prepare an overview paper on the state of the art on the topic for publication in *Irrigation and Drainage (IRD)*.

### 3.3 *How is the Working Group expected to collaborate with the other International Organisations?*

3.3.1 International Organisations can contribute to the activities of the WG by nominating Permanent Observers (PO). On the other hand presentations of the work and achievements of the WG can be presented at the occasion of events organized by International Organisations.

## 4. Work Plan

### 4.1 Scope

4.1.1 The WG is expected to investigate, analyse, and disseminate information on new developments and to formulate recommendations with respect to:

- (a) planning and preparation for modernization and revitalization of irrigation schemes;
- (b) interaction between modernization, revitalization and required operation and maintenance;
- (c) cost sharing for modernization, revitalization and required operation and maintenance;
- (d) institutional and organizational framework required for modernization, revitalization and operation and maintenance;
- (e) methods and techniques of lining of conveyance and distribution canals;
- (f) canal control systems with respect to their automation, using internet, mobile communication and remote monitoring in canal operation;
- (g) modification to improve communication, operational capacities and flexibility in operation and maintenance of systems;
- (h) standardization and codes of practice in irrigation systems.

4.1.2 With respect to the last item interesting work has already been done in New Zealand. Therefore the relevant aspects of this activity are already presented in **Appendix A** of this Workplan.

4.1.3 A proposal for the three year rolling plan is shown in **Appendix B**.

### 4.2 Target audience

4.2.1 The target audience for this working group will be managers of irrigation schemes, researchers, consultants, manufacturers, government officials, farmer's representatives and staff of International Organisations working on the topic.

### 4.3 Outputs

4.3.1 The following outputs can be expected from this WG:

- (a) although it is an indirect output sharing of knowledge and experience by representatives of NCs will also enable them to disseminate this knowledge within their country;
- (b) condensed overview of existing key books, manuals, guidelines and other relevant publications on the topic;
- (c) the WG is expected to organise on an annual basis a workshop, seminar or symposium at occasion of an international ICID meeting;
- (d) ICID codes of practice and standards for modernization of irrigation systems;
- (e) position paper on key issues on modernization of irrigation schemes;
- (f) overview paper on the state of the art for publication in *Irrigation and Drainage (IRD)*.

### 4.4 Timelines

4.4.1 While modernization of irrigation schemes is a very important topic in light of its role in support of global food production it is recommended that the initial term of this WG will be set at six years. The timeline would have to be based on the scope of work and the expected output. Details of the timeline would have to be formulated and refined during the inaugural meeting of the WG.

### 4.5 Collaborators and dissemination strategy

4.5.1 The WG would have to base its activities on an open attitude with a clear scope for invitation of outsiders that are interested in the topic on a Permanent Observer (PO), or ad hoc basis.

4.5.2 The dissemination strategy would have to be based of reaching those who can apply the findings and recommendations of the WG in their research and especially in policy development, decision making and implementation in practice.



**Appendix A to Annex 1, Para 4.1.2**

**1. Relevant Aspects of Work in New Zealand With Respect To Standardization and Codes of Practice**

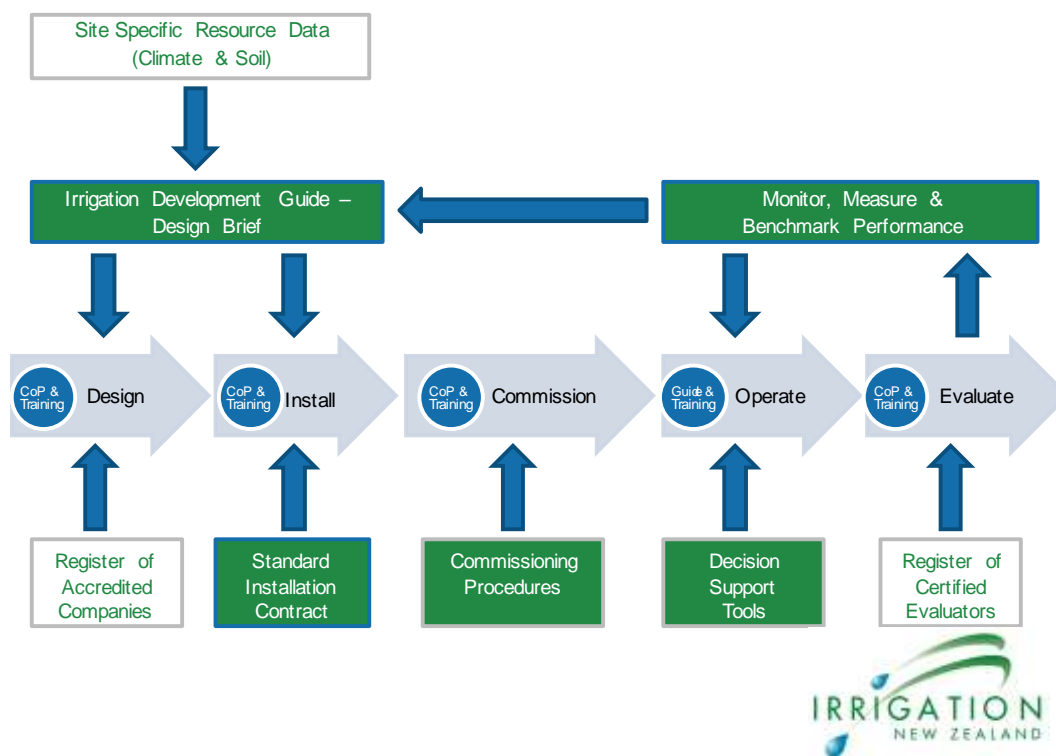
1.1 Over the last decade Irrigation New Zealand (INZ) has placed much of its focus on developing and publishing comprehensive Codes of Practice and Standards for design, installation and evaluation. The reasoning for this is explained below. INZ is willing to put these documents on the table as a starting point for an international discussion, providing it is included within the project development team. INZ has much to share with its international partners as regards Codes of Practice and Standards development and implementation. INZ acknowledges its documents are not perfect, but they do provide a sound starting point. If the ICID finds in favour of the need for International Codes of Practice and Standards, INZ is willing to work with IAL to develop a full project proposal to be presented at the next ICID meeting.

**2. The catalysts for Codes of Practice and Standard development in NZ**

2.1 Irrigation in New Zealand currently faces two environmental barriers for its continuation and further development - water scarcity and more importantly the subsequent water quality impacts of land use intensification (nutrient losses through drainage and run-off) that irrigation often results in.

2.2 The recent rapid development and modernisation of irrigation in NZ has resulted in issues with 'rogue irrigation service providers'. This resulted in reputable irrigation service providers and irrigators requesting that industry bottom lines to be put in place to help safeguard an irrigators investment. Ten years after their inception these standards are now beginning to be utilised within the regulatory framework. For examples; court cases related to substandard design and installation have questioned whether the Irrigation Codes of Practice and Standards have been followed by the contractor; water permits now commonly include conditions that any future upgrade or development should be consistent with the Irrigation Codes of Practice and Standards.

2.3 To combat the above issues, primarily to address the regulatory and other community stakeholder concerns, INZ has produced an 'Irrigation Good Management Practice' strategy and resulting implementation framework (Figure V.1). This is now known as 'SMART Irrigation' - SMART being Sustainable, Managed, Accountable, Resilient and Trusted Irrigation.



**Figure A.1. INZ SMART Irrigation Framework**



### 3. Code of Practice and Standards development in NZ

- 3.1 INZ learnt early-on that developing a list of prescriptive standards for irrigation was an impossible task. Irrigation system design and installation is dynamic (changes over time and space) and thus site specific. To attempt to produce an inclusive 'standards list' for every scenario is highly impractical. It would also result in an outcome that was not user-friendly. Instead the focus was placed on the process to be followed, moving through each of the steps of the design process and detailing the considerations and resulting decisions to be made. Having said this there were some areas identified where it was possible to define a universal number or narrative standard to be achieved, hence the production of an Irrigation Design Standards document.
- 3.2 Originally the INZ Design Code of Practice was one document with a comprehensive list of Key Performance Indicators. However during the 2012 review the decision was made to split the Design Code of Practice into a Code of Practice document that contained both Design Parameters (these form the remit for the designer – the design inputs) and Performance Indicators (these are measurable outputs from the design). The Design Standards document then selected Performance Indicators upon which a universal industry standard could be applied either numeric or narrative.

### 4. Outline for ICID Irrigation Codes of Practice and Standards development

- 4.1 INZ is willing to put forward its Codes of Practice and Standards as a 'strawman' upon which an ICID led project to develop an internationally recognised Irrigation Code of Practice and Standards could be based. In order for this to occur INZ would require inclusion in the project team. The NZ Codes of Practice and Standards are regarded as living documents. This recognises technology is ever evolving, and as increasing numbers of practitioners utilise them further knowledge and experience will be captured.
- 4.2 INZ accepts that the Code of Practice and Standards have been developed primarily with an agricultural spray and drip/micro focus, with amenity irrigation as a second priority. Surface irrigation is not included as the total area irrigated by such methods in NZ has rapidly reduced over the last decade, mainly due to the production gains from well-run spray based systems. Despite the above the format of each code of Practice has been well tested and would be nonsensical to deviate from. For example, there is little difference between spray, surface and amenity irrigation as regards the design process:
- (a) gather information;
  - (b) decide performance parameters;
  - (c) system design;
  - (d) final specification and quotation;
  - (e) implementation.



## THREE YEAR ROLLING PLAN

Item of Mandate	2014	2015				2016II				2017				Actor(s)
Mailing of Minutes and Scoping Document to participants Inf. Meet.														Convenor
Comments on Updated Scoping Document, subm. of information														Participants informal meeting
Finalising Scoping Document and detailing of Workplan														Convenor
Invitation to NC for nominations and information														Central Office
Input to Theme 2.1.3 of WWF7														Participants informal meeting
Submission of nominations and information														National Committees
1st Meeting Montpellier														Members and Permanent Observers
Exchange of information, knowledge, experience, networking														Members and Permanent Observers
Condensed overview of key books, manuals, guidelines, etc.														Members and Permanent Observers
Preparation and presentation of reports and/or case studies														Members and Permanent Observers
Collect and review manuals, guidelines, codes of practice, etc.														Members and Permanent Observers
Organise international workshop, seminar or symposium														Some Members
2nd Meeting in Chiang Mai, including Workshop														Members and Permanent Observers
Prepare an overview paper on state of the art for publication in <i>IRD</i> .														Some members
Formulation of recommendations														Some Members
Position paper on key issues on modernization of irrigation schemes														Chairperson, Vice-Chair and Secretary
3rd Meeting in Mexico, including Workshop														Members and Permanent Observers

<sup>i</sup> Annex 1 [66<sup>th</sup> IEC Agenda, Appendix XXIV, page 221]