

SCOPING DOCUMENT

WORKING GROUP ON USE OF NON-CONVENTIONAL WATER RESOURCES FOR IRRIGATION (WG-NCWRI)

1. Introduction

1.1 With the rapid development of economy and the increasing growth of population, Shortage of fresh water becomes a global problem. Agriculture is the biggest water consumer nearly accounting for 70% of the total water supply worldwide. Use of Non-Conventional Water Resources for irrigation could meet such fresh water shortage. Non-Conventional waters consist of raw domestic/industrial wastewater, reclaimed water, agricultural drainage water, mining water, harvested rainwater, and brackish/saline groundwater. In many developing countries, a major part of the wastewater generated by domestic and industrial sectors is used for crop production in an untreated or partly treated form. The protection of public health and the environment are the main concerns associated with uncontrolled wastewater irrigation. In other words, the quality of the produced food, the consumer safety and the health of farm workers are of great concern. Other concerns include the salinity and heavy metal accumulation and pollution caused by nutrient leaching. In fact, secondary effluent contains dissolved solids, heavy metals, pesticides and pathogens that might jeopardize sustainable agriculture, groundwater quality, soil quality/ productivity and human health, however, the nutrients contained in such waste water are beneficial for agriculture up to certain concentrations.

It is very important to prevent contamination and reduce contamination risks for NCWRI, therefore, a set of techniques, policies and strategies must be considered in the process of planning, designing, operation and management.

1.2 Despite national water quality standards related to NCWRI released by some countries, there are no globally accepted guidelines or standards with respect to planning, designing, operation and management which is urgently needed for NCWRI.

1.3 The following aspects are of major importance for safety and efficient irrigation with non-conventional water resources:

- (a) Feasible plan at regional level to minimize soil and water contamination.
- (b) Election of tolerant plants especially when using saline/brackish water to obtain good economic yields and product quality.
- (c) Continuous monitoring and evaluation of irrigation practices to prevent environment degradation.
- (d) Learning and compiling successful experiences from different countries to help those who have no experience with the use of non-conventional water resources.
- (e) Enhancing quality standards and codes of practice for NCWRI to ensure safe and efficient use.
- (f) Formulating policies and regulations to encourage the use of NCWRI.
- (g) Ensure environmental and economic sustainability using non-conventional waters in particular for the countries where these waters are the only available resources.
- (h) Develop capacity building programme (workshops, seminars, visiting sites, etc.) to train the users of NCWRI.
- (i) Develop a programme to involve stakeholders and local water authorities.
- (j) Inclusion of governance and institution as well as the gender in the whole practice of NCWRI.
- (k) Contributing to the Water-Food-Energy Nexus adopted by ICID with NCWR at heart.

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 work plan will be presented.

2. Objectives

2.1 Relevance of the NCWI working group

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

- (a) The remit and mandate of NCWRI is relevant to the mission and purpose of ICID and promotes science and technologies in acquiring and managing non-conventional water resources for irrigation in developed and developing countries.
- (b) The use of NCWRI WG is expected to contribute to sustainable agriculture water management by using NCWR.

- (c) The use of NCWR is expected to improve food security, increasing food production, increasing water productivity and increasing irrigated land area.
- (d) NCWRI will be the key topic of most NCs to help alleviate global fresh water shortage.

2.2 Relevance of the NCWRI WG to the scope of the Thematic Area

- 2.2.1 NCWRI falls under ICID strategic theme of “On Farm” which is relevant to water management at field scale. NCWR WG will cover different aspects of “on farm” irrigation and drainage but with difference as management of NCWR requires different “on farm” management.
- 2.2.2 Technical and institutional solutions development may be required for promoting of non-conventional water resources for irrigation.
- 2.3 Existing gap that the Working Group is expected to fill
- 2.3.1 Other ICID WGs that have related scopes of work are: WG-DROUGHT, WG- Water & Crops, WG-ON-FARM are mostly focused on fresh water availability while WG-ENV focuses on protecting the environment from the excessive use of fertilizers and agrochemicals.
- 2.3.2 None of the WGs are presently mandated to study the issues related to safe and efficient use of NCWRI.
- 2.3.3 The new WG was made aware of the activities of these WGs prior to the preparation of this Updated Scoping Document.
- 2.3.4 The new NCWR WG will attract more members involved in the themes of NCWR as this area of science is wider than the previous area of poor quality water of the current WG.

3. State of knowledge on the topic

3.1 Other International Organizations that are working on the subject

- 3.1.1 There are several other International Organizations, Universities and institutes that have programs and activities on this topic. This especially concerns the:
 - (a) Food and Agriculture Organization of the United Nations (FAO);
 - (b) World Health Organization (WHO)
 - (c) International partnerships: World Water Council (WWC);
 - (d) Relative research institutes: Agricultural Research Organization of Israel (ARO); The Jacob Blaustein Institute for Desert Research (BIDR); U. S. Salinity Laboratory, ARS; Technical and Research Center of Suez Environment (CIRSEE); Commonwealth Scientific and Industrial Research Organization, Australia (CSIRO), Chinese Academy of Agricultural Sciences (CAAS), China Institute of Water Resources and Hydropower Research (IWHR), Beijing Institute of Science and Technology (BWSTI).
 - (e) Universities: Israel Institute of Technology (Technion); China Agricultural University (CAU); University of Western Australia (UWA); University of Ottawa (WO); Central Asian Research Institute of Irrigation (SANIIRI); Iowa State University (ISU); Islamic Azad University (IAU); Bahauddin Zakariya University (BZU); Central Soil Salinity Research Institute (ICAR-CSSRI); Wageningen University (WU); University of California Riverside (UCR); University of Utah (UT); University of Sydney (USYD); Alexandria University (AU); Michigan State University (MSU).

3.2 Mandate of the Working Group

3.2.1 Mandate of the Working Group can be formulated as follows:

- (a) Exchanging knowledge, experience and data as well as networking on the topic in order to be up-to-date with new developments, methods and approaches.
- (b) Preparing comprehensive reviews and prospects with respect to different aspects of NCWR.
- (c) Producing technical manuals, guidelines or standards with respect to all NCWR including waste water, drainage water and saline/brackish water.
- (d) Organizing international workshops, seminars and meetings on the NCWR topic.
- (e) Producing documents on successful case studies with the new developments with respect to NCWR presented by the members from different countries.
- (f) Enlarging the membership of the WG by encouraging more member countries where the use of non-conventional waters is a common practice for irrigation management.
- (g) Finalizing the publication of a Technical Paper pending from the activities of the WG-PQW.

- 3.3 How is the Working Group expected to collaborate with the other International Organizations?
- 3.3.1 International Organizations can contribute to the activities of the NCWRI WG by nominating Permanent Observers (PO). On the other hand, presentations of the work and achievements of the NCWRI WG can be presented at the events organized by International Organizations.
- 4. Work Plan**
- 4.1 Scope
- 4.1.1 The NCWR WG is planning to formulate recommendations through investigation, and knowledge exchange of new developments. The NCWRI-WG will be able to advise on:
- (a) Optimum planning and design of irrigation that safeguard the environment when using NCWR;
 - (b) Managing field crops by considering the type of crops that suit the NCWR, e.g. selection of salt tolerant crops for each water salinity level;
 - (c) Suitable techniques/treatments to improve irrigation water.
 - (d) Best irrigation strategies to avoid environment pollution;
 - (e) Matching irrigation systems for use with NCWR, e.g. anti-clogging and pressurized irrigation system;
 - (f) Monitoring & evaluation of soil and water environment;
 - (g) Standardization and codes of practice in design, operation and management.
- 4.1.2 A proposal for the six-year plan is show 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, government officials, farmers/farmer's representatives, students, young professionals, agronomists, irrigation engineers, and staff of International Organizations working on the topic (e.g. FAO, IFAD, and WB).
- 4.3 Outputs
- 4.3.1 The following outputs can be expected from this WG:
- (a) Knowledge and experience exchange among representatives of NCs;
 - (b) Comprehensive review papers to be published in irrigation and Drainage (IRD) or ICID;
 - (c) Technical reports/supplements to IRD/ICID on successful study cases.
 - (d) ICID guidelines /recommendations on the use of non-conventional water resources for irrigation.
 - (e) Annual/bi-annual workshop, seminar and symposium to be held at the ICID events
 - (f) Developing and running capacity building program dedicated to the NCWR users.
- 4.4 Timelines
- 4.4.1 While use of non-conventional water resources for irrigation is a very important issue in light of its role in alleviation of global water shortage and support of global food production it is recommended that the 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 NCWRI WG would strengthen links with relevant international organizations.
- 4.5.2 The NCWRI WG would promote collaboration among members and permanent observers from different NCs.
- 4.5.3 The media (Twitter, YouTube, Blogs, Facebook, Instagram, etc.) would be used for dissemination of the developments and approaches in this topic.



Appendix B to Annex 1, Para 4.1.2

SIX-YEAR PLAN

Item of Mandate	2018	2019	2020	2021	2022	2023	Actor(s)
Preparing Draft work plan and Mailing to Participants							Chair/Secretary
Comments incorporated in an Updated Work plan Document							Participants in informal meeting
Invitation sent to NCs for nominations and Information							Central office
Submission of nominations and information							NCs
1 st Meeting in Saskatoon, Canada							Members and PO*
Knowledge and experience exchange as a continuous activity							Members and PO*
Preparing review paper on the NCWRI to be published in IRD/ICID							Members and PO*
ICID guidelines on the use of waste water for irrigation. This activity will only be realized if the WG gets help from relevant Organizations such as FAO, IFAD, WHO							Some Members and invited participants
Capacity Building- Training Workshop							ICID-HQ to advertise
Organizing International workshop on 2019 on Water-Food-Energy Nexus - the case for NCWRI							Members, PO* and invited participants

