Abstract of Final Report

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1. Please itemize your own personal goals in the units and the results of the trainings per unit concisely. (Wrap up all the Crystal Water descriptions)

Unit of Training	Your own objectives	The Result of the Training
(1) Water Storage and Supply Facilities / Facility Management	o Sustainable ways of planning, designing & operating water storage supply schemes.	o Cost effective ways of lining canals e.g. using agricultural byproducts is learnt as an option to reduce the large cost associated with construction of distribution network in Irrigation projects in my country. o This session gave me an insight as to how to diagnose deterioration of concrete structures, which is essential for their timely maintenance. Efficient ways of analysis of seepage flow and new construction method for fill dams (RCD) was learnt.
(2) Farm / Forest Management and Food Policy	o Promoting conservation of forest and its ecology. o Efficient ways of farming & irrigation	The following are some of the core points learnt: o Careful bookkeeping of the farm, which actually does not entail any significant cost but is often neglected and collection of appropriate information on the farm is one of the pillars for efficient management of the farm. o Maintaining the functions of forests is seen as higher benefit to public life, natural environment and augmenting the water resources, thus it should not be viewed solely as economic function.
(3) Ground Water	o Hydrogeological investigation in the absence of highly specialized instruments. o Conjunctive use of both surface & ground water o Groundwater quality management	o Domestic water supply mainly relies on ground water in my region; potential sources of groundwater pollution and its appropriate countermeasures are studied here. o In many instances there is a need for lowering groundwater table in this section various techniques are investigated. o Introduction of underground dam can be another strategy to conserve high losses of evapotranspiration in tropical climates and resettlement problems occurring from surface water storage dams. But the cost and all its ill effects have to be critically evaluated first.

(4) Soil/Water Quality Assessment	o Preventive and remedial measures for salinity problem like cost-effective ways of drainage techniques.	o On hand experience of evaluating soil and water chemical properties and what its implications for irrigation, Learnt how waste can be a potential resource. o treating wastewater and safely disposing it and further augmenting water supplies for irrigation and industry through recycling wastewater
(5) Field Water and Soil Management	o Suitable techniques of managing water on the field right from the planning phase to operation & management.	Various aspects of Irrigation management from planning to management are explored: o Different ways of making irrigation scheduling. o Evapotranspiration computation o Appropriate ways of evaluating water distribution systems assessing the adequacy, efficiency, spatial and temporal distribution patterns. o Measures to prevent secondary salinization like bio-drainage, ground water management. o Soil moisture management-recent trends for measuring soil moisture content like TDR. o Water harvesting and drip irrigation techniques
(6) Practice on the Design of Water Supply/ Distribution Systems	o Flexible design which cater for rapid change in population o Appropriate maintenance strategies for water supply schemes.	o Different preventive measures for water hammer pressure o Power saving automatic gate controller of Hokoku, which unlike others is not affected by waves. o Self-priming pump patented product of Yokota
(7) Crops/Plants suitable for Arid Regions	o Identification of Crops suitable for arid region o Environmental friendly ways of fertigation	o Crops that can withstand harsh climatic conditions were learnt. Some crops like Katsu are quite good for erosion prevention o Sedum crop may grow with less soil conditions and adjust to different climatic changes. Some crops are drought tolerant like wolfberry (Ninxia).
(8) Preservation of Greens/ Assessment of Vegetation	o Intensive cultivation which give higher yields on small tracts of land. o Agro-forestry	o Causes and control of deterioration of plants and soil in semi-arid area. o Application of tree ring chronology to climatology, hydrology and ecology. o Analysis of land use/land cover using remote sensing. o Ecological mitigation to maintain biodiversity.

2. Please itemize the training contents that you acknowledged as effective and give clear summaries of the supportive reasons.
（More than three subjects，Mark all that apply.）

Unit of Training	Training Contents	Reasons
Ground Water	o Underlying principles groundwater flow, and occurrence of groundwater. o Causes and effects of saline water intrusion into aquifer and estimation of the depth of fresh and saline water interface using electrical soundings, and borehole tests. o Measures for the prevention and mitigation of saline water intrusion are also explained.	o This course was designed to give hand on training on practical matters throughout its development. It gives the opportunity to deeply explore analysis of ground water flow both analytically and numerically through classwork and assignments o Groundwater has harmful effects on slope stability and safety of excavation thus considering its effects on surrounding area detailed methods of groundwater lowering are provided
Field Water and Soil Management	o Methods of estimating evapotranspiration including past and present trends using appropriate tools. o Field water management for water saving and salinity control. o Basic principles of soil water and solute movement.	o This course has an in-depth treatment of the subject. It also highlighted essential issues regarding E.I.A. of Irrigation projects. o Clear view about soil water physics and solute transport is outlined o Theory for irrigation scheduling is explained o Using different case studies ways to evaluate management efficiency of water-use systems was addressed which can be a good lesson to assess inefficiency and recommend appropriate measures in irrigation systems in my country.
Water Storage and Supply Facilities / Facility Management	o Causes, symptoms and various tests of deterioration in concrete structures. o Basic theories of seepage flow and slope stability of filldams and embankments. o Design theory and construction methods for various dams.	o Economical ways of construction has been dealt, which is one of basic issues in developing countries. o Methods to determine the extent of deterioration of drainage canals as a way to estimate the life of the structure and to find anti-deterioration measures o Enhancing durability of drainage canal is explained. o Measures to mitigate harmful effects of seepage flow. o The course includes observation on different phases of water storage facilities construction
Preservation of Greens/ Assessment of Vegetation	o Ecology in semi-arid regions, and the methods for ecological preservation and greening. o The sand dune ecology and the sand dune fixation method. o Aqua-physiology of trees in arid regions. o Remote sensing as a method for evaluating the vegetation and land utilization	o Each section of the course started by taking into consideration the diversified specializations the participants have. o Deterioration of fauna and flora, which is one of prominent problems facing my country, is discussed. o Analysis of tree ring and its multi-farious applications is impressive. o Mitigation of ecology drawing experiences from various countries was learnt

3. Please itemize briefly and to the point on the contents of the project(s) and/or action plan(s) that you are planning to carry out or to set up. Please title each project planned and/or action plan to present a concise picture of the contents as well as practical problem(s) to be settled. （More than three subjects，Mark all that apply.）

Title(s)	The outline of the project (s) or action plan(s)	Practical Problems to be settled for the stated plan
Pilot project for Small scale Water powered Irrigation system	o Local development of hydraulic rams and investigation of its applicability for small scale irrigation o Examining possibilities of utilizing Lake Abaya for irrigation purpose o Feasibility study for Drip irrigation system o Investigation of drainage system with emphasis on bio-drainage to rescue the Abaya crocodile farm and its environs.	o Owing to the rugged terrain predominantly existing in the country, Small-scale farmers suffer due to lack of economical way of lifting water for irrigation purpose. o Subsistence farming using rainfed agriculture is frequently facing failure because of erratic nature of precipitation.in the locality o The ecosystem of Abaya crocodile farm is threatened by frequent flooding and submergence caused by nearby lake.