Final Report
On Implementation of PGTF Project PRK 10/00048439 (INT/06/K01) "Training of Irrigation and Drainage Designers for Protecting the Drought and Flood Damages in the Developing Countries"

Irrigation Design Research Institution, Ministry of Agriculture , DPR Korea
August 16, 2006

The 29th Ministerial Meeting of the Group of 77 held in New York on 22 September 2005 approved the PGTF project "Training of Irrigation and Drainage Designers for Protecting the Drought and Flood Damages in the Developing Countries" , which had been submitted by the Irrigation Design Research Institution , Ministry of Agriculture (IDRI).
DPRK National Coordinating Committee for UNDP (the executing agency) and IDRI (the implementing agency) started implementation of the project on December 2005.
This report includes background, activities, results, a bill and annexes to the accomplishment of Perez-Guerrero Fund' Project PRK10/00048439(Int/06/K01)

1. Background

Development and rational use of the water resources including irrigation and drainage is one of the urgent problems in the view of both present realities for reduction of agricultural production caused by flood and drought and anticipative circumstance for continuously abnormal climatic phenomena.
Developing countries have gained valuable experiences and scientific and technical successes in development and design of irrigation and drainage systems, mobilizing the local potentials and strengthening the S-S technical cooperation on the principle of collective self-reliance.
But some of developing countries couldn't reach the satisfactory level in the field of irrigation and drainage development with the lack of technicians, technique and fund, which resulted in not-control of flood and drought damages.
To get rid of the difficulties and manage irrigation and drainage properly in the developing countries, we have to build up our capacities by learning the vast experiences and lessons obtained in the past activities of water resource management.

Irrigation Design Research Institute of MOA , D.P.R. of Korea came to a decision to make a contribution to south-south cooperation by undertaking a training workshop of the irrigation and drainage experts on the basis of the institute's experiences in designing the latest canal projects in DPRK such as Kaechon-lake Taesong Canal and Baekma-Cholsan Canal.
This project has invited the developing countries which regard water management as a priority, but have less experiences and fund for the irrigation and drainage system development and the drought/flood damages caused by the changeable climate.
The irrigation experts from the countries-Ethiopia, Uganda, Nigeria, Sudan and D.P.R. of Korea- attended at the lectures of "Drawing-method of the master plan design for irrigation construction", "Drawing-method of the medium and small scaled projects for irrigation and drainage", "Drawing-method of controlling inundation in a river and streams" in combination with the actual experiences, theories and the summary of the guidelines.
The workshop has laid the basis for self-solutions to the issues in the fields of designing and technique that should be solved on the first hand in development of the water resources.

2. Activities for project Implementation

The government of D.P.R. of Korea formed the Working Group for the Project Implementation with Mr. Kim In Ryong, S-S cooperation project coordinator in NCC for UNDP, Dr. Kim Jung Ryan, Dr. Kang Il Won from the Irrigation Design Research Institution, MOA as responsible co- managers.

The Group selected 4 officials as the technical advisers for the respective parts, who have got the profound techniques, theory and the long-term experiences.

The program course consists of 3 subjects of "Drawing-method of the master plan design for irrigation construction", 7 subjects of "Drawing-method of the medium and small scaled projects for irrigation and drainage", 5 subjects of "Drawing-method of controlling inundation in a river and streams"

Actual data was prepared for exchange of the practical experiences of managing water resources in Ethiopia, Uganda, Nigeria, Sudan and D.P.R. of Korea.

A field visit mission consisted of Mr. Kim In Ryong, coordinator of NCC for UNDP and Dr. Kang Il Won, adviser was sent to the participant countries to know better the realities through a site observation and analysis.

27 Jun to 15 July 2006, the mission had talks with the relevant officials such as the General Director of irrigation, MOA in Uganda and the Director of irrigation, MOWR in Ethiopia and exchanged mutual experiences and problems in development and management of irrigation and drainage and the preparatory data to be used in the workshop.

The information mission got in the field were effectively used in the Pyongyang Workshop.

The workshop was successfully conducted 19-25 July 2006 in Pyongyang, the capital city of D.P.R. of Korea.

In the opening ceremony, Dr.Kim Jong Ryang, the Director of the Irrigation Design Research Institution, MOA, D.P.R. of Korea made an opening speech and the lecturers were introduced.

Attended were 4 trainees from Ethiopia, Uganda, Nigeria, Sudan and 7 from the D.P.R. of Korea. The trainee list was shown in Annex 1 and the training titles and the brief summaries were in Annex 2.

The workshop dealt with the experiences gained in the designing and construction of the irrigation and drainage systems and the current international trends concerned with these fields in combination of the practice, through which the trainees received the practical and applicable knowledge.

The participants visited the existing irrigation and drainage facilities in D.P.R. of Korea and field lectures were made at the Sohung Irrigation System, the Unpa Irrigation System, the Kaechoen-lake Taesong Canal, Gyonryong Reservoir, the West Sea Barrage and Onchon Canal.

In the closing ceremony, a letter of thanks to H.E. Mr. **Kim Jong IL** was adopted unanimously, highly appreciating the success of the workshop with his deep attention and the assistance of D.P.R.K Government.

The trainees received the qualified certificates (diploma) of the attendance at the workshop.

They suggested that such kind of the workshop be organized more through the Group of 77 in the future and confirmed that they learned the advanced irrigation techniques and knowledge.

And they expressed their intention to propose to their government that they would do their efforts for technical cooperation with the experts in D.P.R. Korea after coming back to their countries.

3. Results of Project Implementation

1) They have felt that there should be steps taken to improve the current irrigation and drainage systems as they did analysis of the local irrigation situation and its utility in the project countries in the training.
2) They recognized that there must be the general design independently for irrigation construction.
3) The foundation is laid to strengthen the potential by developing the water resources for the effective usage of the irrigation water by the local force and also to insert great investment needed for development.
4) They are able to draw designs of the medium and small scaled irrigation and drainage projects and to enlarge the design-working forces with the ready trained experts as the core.
5) Technical foundation was laid to take measurements against flood damages as well as acquiring the drawing methods for controlling inundation in a river and streams
6) The trainees increased the technical abilities on reasonable selection of the headwaters in establishment of irrigation and drainage system and the judgment of the advantage and the unreason ability in planning the structures.

4. Recommendations

The IDRI, MOA D.P.R. of Korea reaffirmed that it is important to make an active development for controlling drought and flood to increase the agricultural production in the developing countries in the project implementation. And we also find that the priority would be given to the training of officials in charge of irrigation and drainage and it is necessary to continue the training through the Group of 77 with the close cooperation and assistance among the member countries for the implementation of the training projects.

5. Bill

The fund of US$ 34,827 from PGTF was spent for project implementation accountably as follows:

No	SPECIFICATION		COST (US$)
1	PERSONNEL		
	Project Coordinator	(1)	US$500
	Project Manager	(2)	US$1,400
	Advisors	(4)	US$2,200
	Trainers	(5)	US$1,650
	Assistants	(3)	US$700
	Trainees	(11)	US$6,000
2	TRAVEL		US$12,500
3	PLACES OF LECTURE/PRACTICE,		US$2,800
4	MATERIALS, STATIONARY		US$4,629
5	DATA PROCESSING		US$1,000
6	DOCUMENTATION		US$1,100
	TOTAL COST:		US$ 34,479

On 22 March 2006 IRDI received US$ 31,023 from UNDP Pyongyang CO, 90% of US$ 34,479 along with its deduction of US$ 348, 1% as a UNDP service fare from US$ 34,827 which is the allocation from PGTF for project implementation. US$ 3,482, the remaining 10% of US$ 34,827 to be sent by UNDP Resident Representatives in DPRK right after receiving project final report, will be used by IRDI to pay for the services it has received for project implementation.

Annex 1

- List of Trainees

No.	Country	Name	Sex	Age	Occupation
1	Ethiopia	Ketsela Mengstu Estifanos	M	41	Expert Agriculture and Forestays Department Ministry of Water Resources
2	Uganda	Ben Hazard Torach	M	45	Irrigation Project Officer Ministry of Agriculture
3	Nigeria	Silas Chikezie Okoli	M	47	Expert Small Scale-Dam Department Ministry of Agriculture
4	Sudan	Hassan Ahmed Widda	M	58	General Director Finacing and Administration Directorate Ministry of Irrigation
5	D.P.R.K.	Pak Chun Nam	M	47	Head of Irrigation Department IDRI, MOA
6	D.P.R.K.	Kim Ung Kun	M	42	Irrigation Engineer IDRI, MOA
7	D.P.R.K.	Li Nam Jin	M	37	Irrigation Engineer IDRI, Pyongyang City
8	D.P.R.K.	U Chang Ho	M	36	Irrigation Engineer IDRI, South Pyonan Province
9	D.P.R.K.	Li Sun Nam	M	41	Irrigation Engineer IDRI, North Pyonan Province
10	D.P.R.K.	Sin Yong Su	M	40	Irrigation Engineer IDRI, North Hwanghae Province
11	D.P.R.K.	Choe Zun Hak	M	36	Irrigation Engineer IDRI, South Hwanghae Province

- List of Trainers

1.	Kim Hak Chol	M	63	Geology and soil Expert, IDRI, MOA
2.	Jon Mun Hook	M	53	Land Construction Expert , IDRI, MOA
3.	Choe Bong Sun	M	65	Drainage Expert, IDRI, Pyongyang City
8	Kim Dong Sin	M	58	Irrigation Engineer, IDRI, South Pyongan Province
9	Bak Chong Won	M	64	Irrigation Engineer,IDRI, North Pyongan Province

Annex 2

The titles and the brief contents of the lectures in the workshop

Title 1 “Drawing-method of the master plan design for irrigation construction”

1) Survey methods and main points/technical demands and standards for the field survey and the main survey for the drawing of the general design
2) The main principles for the drawing of the general design, planning of the structures (reservoir, pumping station, weir), assessment of the water amount, canal, planning method for structures and its following technical problems and the assessing method of the economical efficiency
3) The principle and main points for the making of the general design
   Format of preparation of the description, the technical main points for each item and its preparation methods, documentation for the approval and agreement

Title 2 “ Drawing-methods of the medium and small scaled project for irrigation and drainage”

1) Field work for the technical design-drawing preparation of the field work, technical main point s and methods for the assessment and survey for the reservoir, canal, tunnel, technical demands for the maintenance of the levels of science and feasibility.
2) Technical standards for the geographical survey, the main points of the survey of the structures for construction, needs and method for the soil fertility, sample handling principle, agricultural status for the assessment of the economical proficiency and the economical survey and its procedures.
3) The accounting principles and methods according to the partial design drawing and the structures, standards for water amount accounting, capacity and reliability assessment of the reservoir including the bank, hydrological assessment of the cross section in the canal, the methods of the hydrological and structural assessment of the canal structures including the siphon, the contents of the design drawing and the assessment of the workload.
4) Budgeting method for design drawing, price, the distribution of the total investment and its accounting system and method
5) Formatting and assessment/approval of the general design and its necessary documents

Title 3 “Drawing-method of controlling inundation in a river and streams”

1) Technical main points and method of the survey for the drawing of the design of the stream and river
2) Accounting method for selection of the flow amount and the selection of standard water flow
3) Accounting of the cross section of the planned canal in a river and streams
4) Accounting of the reliability of a river and streams, and the rational selection of the position of the bank
5) Planned method of flood accounting and method for selection of the standard water level
6) Accounting of the drainage water amount and accounting methods of the culvert

Title 4 Video Lecture

The video lecture covers the innovative successes and data on the4 construction means used from the inauguration of Nampo lock to the implementation, on the modern engineering techniques and construction of the barrage.

Title 5 Field Practical Training

Visiting the Kaechoen-lake Taesong canal, Gyonryong reservoir, lake Sohung and lake Unpa, the field lectures were given with the principle problems in designing the headwaters such as the earth dam, concrete dam, intake facilities, spillways with alternative condition of structure, selection of structures along the canal, and technical demands in maintenance and management of them.