

Perez-Guerrero Trust Fund for Economic and Technical Cooperation  
among Developing Country Members of Group of 77

Final Report on the Implementation of the Project

"Training for the Designers for Protecting the Drought Damage  
by Undertaking the Effective Irrigation Construction  
in the Developing Countries"

## **Final Report on the implementation of the Project**

### **"Training for the Designers for Protecting the Drought Damage by Undertaking the Effective Irrigation Construction in the Developing Countries"**

The Committee of the Experts for the Perez-Guerrero Trust Fund approved the primary withdrawal of US\$ 40,000 from the Perez-Guerrero Trust Fund to the Government of D.P.R. Korea for the implementation of the Project after the appraisal of the Project " Training for the Designers for Protecting the Drought Damage by Undertaking the Effective Irrigation Construction in the Developing Countries " proposed by the Government of D.P.R. Korea had proposed on the September 15, 2002.

The sub-contract was made between the Government of D.P.R. Korea and the Irrigation Design Center, Ministry of Agriculture (MOA), D.P.R. Korea to implement the PGTF-approved Project.

This report includes the implementation activities and a bill of the Project.

#### **1. Project Background**

Today, the agriculture situation in the developing countries is getting worse due to drought and flood caused by the current changeable climate and furthermore the prospect of its continuation requests them to develop the water resource management including irrigation and drainage as a matter of priority.

In the recent years, great efforts have been exerted in the developing countries to prevent the drought and flood by mobilizing local possibilities and potentials on the principle of collective self-reliance. But, the irrigation and drainage systems have not yet been developed to a reliable level because of shortage of techniques and funds and therefore, the agriculture remains vulnerable to the prevailing drought and flood.

In order to cope with the current difficulties facing the developing countries, their designers should be trained in a short while to be able to work out the designs by themselves as a first step.

The Irrigation Design Center, MOA, D.P.R. Korea has decided, in consideration of the current requirements, to make a contribution to the south-south cooperation by undertaking a productive workshop with its practical design experiences to protect the agriculture from the drought and flood in the developing countries.

This project covered several African developing countries which are vulnerable to the drought and flood, but have a lack of experiences in irrigation and drainage management. The irrigation specialists from Guinea, Senegal, Mali and D.P.R. Korea attended the lectures titled "Design Method of the Master Plan of Irrigation Construction", " Design Method of medium & small size irrigation and drainage project" and " Design Method of Controlling Inundation in River and Stream" in the combination with the actual experiences and theory and with provision of guidelines.

It laid the foundation for self-solutions to the design and relevant technical problems, the first issue in the development of the water resource.

## **2. Activities for Project Implementation**

The Government of D.P.R. Korea organized an action group consisted of a project coordinator Mr. Kim Kwang Il, officer of the Ministry of Foreign Affairs and 2 chief project supervisors for the responsible parts Mr. Kim Jong Ryang and Mr. Kang Il Won, experts of the Irrigation Design Center, MOA and 16 technical consultants responsible for each part with profound techniques, theory and the long-term experiences.

Program course was prepared for trainees: 3 subjects of " Design Method of the Master Plan of Irrigation Construction ", 7 subjects of " Design Method of Controlling Inundation in River and Stream " and 5 subjects of " Design Method of medium & small scale irrigation and drainage project ".

The necessary data was put in order for exchange of the practical experiences attained in development and use of water resource in Guinea, Mali, Senegal and D.P.R. of Korea.

Workshop place, accommodation and field lecture conditions were arranged in order to ensure the successful implementation of the project in accordance with a national plan.

The workshop was successfully conducted on October 11-18, 2003 in Pyongyang, Capital of D.P.R. Korea. It took place in fully-equipped lecture rooms at the Irrigation Design Center, MOA. At the opening, Mr. Kim Jong Ryang, director of Irrigation Design Center made a speech and outlined the training schedule, followed

by the introduction of lecturers. 8 trainees were present there (2 persons from each countries: Guinea, Mali, Senegal and D.P.R. Korea ). The trainee list was shown in Annex 1 and the training titles and the briefings were attached in Annex 2.

They were supplied with the design tools and bags with stationery and notebooks.

The workshop provided the informal discussions about the experiences in design work and construction of the irrigation and drainage for the water resources development and also the current international trends in these fields through video lectures. They exchanged the practical and applicable knowledge and visited, for field lectures, the West Sea Barrage reservoir, Onchon cannel, Sohung irrigation and Unpa irrigation networks, the newly built Kaechon-Taesong Gravity Water Way and its Weir and Chonggye 1<sup>st</sup>-stage Pumping Station.

At the closing, Mr. Kang Il Won, chief project supervisor, made a speech, followed by the trainees' expression of their comments on the training.

All of the trainees expressed their deep appreciation and sent a letter of thanks to the Great Leader General **Kim Jong Il** for his deep attention to the " Training for the Designers for Protecting the Drought Damage by Undertaking the Effective Irrigation Construction in the Developing Countries" held in Pyongyang, D.P.R. Korea.

They made a suggestion to the Irrigation Design Center, MOA, D.P.R. Korea that this kind of trainings be held again in the future through the Group of 77.

They said that they learned new advanced irrigation knowledge and technology and that the lectures were very interesting and easy to understand and fitting for the actual circumstances of the developing countries in Africa.

They showed the willingness to disseminate the knowledge and technology to their national experts in order to work out effective designs by themselves for irrigation construction and said they would propose to their governments to kindly invite the lecturers to visit their countries.

The trainees received certificates of the course in Pyongyang, D.P.R. Korea.

### **3. Results of Project Implementation**

- 1) The trainees recognized that necessary steps be taken to improve the existing irrigation and drainage systems by making an analysis of the state and use of the irrigation in their countries.

They also learnt or built:

- 2) Methods and capacity for working out a master design on their own in their countries.
- 3) Ability for identifying feasibility on their own to develop water resources and to use effectively irrigation water, and setting forth prospective development targets for investment.
- 4) Ability for working out the medium & small-size irrigation and drainage development projects by themselves without using large fund or relying on the developed countries and thus educating more irrigation designers in their respective country.
- 5) Technical capacity for taking measures to control inundation by mastering design methods of river and stream construction projects.
- 6) Abundant knowledge and technology on realistic selection of headspring structure in setting up irrigation and drainage system and on how to distinguish advantage and disadvantage in designing a structure.

#### **4. Conclusion**

We think that control of drought and flood is of great importance to guarantee high yeild in agriculture in developing countries.

The Irrigation Design Center, MOA, D.P.R. Korea finds through the workshop that training of the personnel in charge of irrigation and drainage is the first to be solved and therefore the same workshops for developing countries is still necessary through the Group of 77 with close cooperation and assistance between the developing countries.

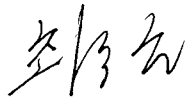
Taking into accounts the experience and suggestions of the trainees, the Irrigation Design Center recommends that effective fund assistance by the Group be made to newly raised PGTF-projects to develop the technology of design, construction and management of irrigation and drainage system in developing countries.

The Irrigation Design Center is proud of having successfully implemented the objectives of the Project as planned.


**5. The fund provided by the Trust Fund of Group of 77 was used for the Project Implementation in an accountable manner as below.:**

No	SPECIFICATION	US\$
1	Official	
	Project Manager/supervisor	4,500
	Consultant	3,000
	Trainee	6,400
2	Travel	
	Supervisor	4,400
	Travel cost for trainee	16,720
3.	Preparation and equipment procurement	4,480
4.	Documentation	500
	<b>TOTAL</b>	<b>40,000</b>

On behalf of the Government of D.P.R. Korea

Choe Su Hon,   
Vice minister  
Ministry of Foreign Affairs, DPRK

On behalf of the sub-contracting agency

Kim Jong Ryang,  
Manager   
Irrigation Designing Institute  
Ministry of Agriculture, DPRK

## Annex 1

**LIST OF TRAINEES PRESENT IN THE WORKSHOP**

<b>COUNTRY</b>	<b>NAME</b>	<b>SEX</b>	<b>AGE</b>	<b>OCCUPATION</b>
Guinea:	<b>Ibrahima Sory Sidibe</b>	M	44	Irrigation engineer Rural Engineering Directorate Ministry of Agriculture
Guinea :	<b>Boubacar Barry</b>	M	36	Irrigation engineer Rural Engineering Directorate Ministry of Agriculture
Senegal:	<b>Babacar Ndiaye</b>	M	38	Irrigation engineer Rural Engineering National Department Ministry of Agriculture
Senegal:	<b>Lety Faye</b>	M	35	Irrigation engineer Rural Engineering National Department Ministry of Agriculture
Mali:	<b>Toure Ibrahim Dallo</b>	M	33	Irrigation engineer Rural Engineering National Department Ministry of Agriculture
Mali	<b>Maiga Yawuba</b>	M	32	Irrigation engineer Rural Engineering National Department Ministry of Agriculture
D.P.R.K:	<b>Yun Chol</b>	M	41	Irrigation engineer Provincial Rural and Economic Management Committee Ministry of Agriculture
D.P.R.K:	<b>Kim Un Yong</b>	F	40	Irrigation engineer Water Cannel department Ministry of Agriculture

## **TITLES AND CONTENTS OF THE WORKSHOP LECTURES**

### **Title 1 " Design Method of the Master Plan of Irrigation Construction "**

- 1) Study methods and main points/technical requirements and standards for the field and main study for drawing the master design.
- 2) The main principles of drawing master design, planning of headspring structure (reservoir, pumping station and weir), assessment of water bulk and plan method and technical parameters of waterway and waterway structure and evaluation method of economic efficiency.
- 3) The principle and main points of drawing master design:  
Description writing system, technical main points for each item and its writing methods, procedures of approval and agreement and documentation.

### **Title 2 " Design Method of medium & small size irrigation and drainage project "**

- 1) Preparation of field work for drawing technical design of medium & small size irrigation and drainage project, technical main points and methods to be included in measurement and survey of headspring structure, waterway and waterway structure, technical requirements for keeping scientific accuracy and efficiency.
- 2) Technical standards for surveying installation things with geographical survey, requirements and methods for testing soil fertility, sample handling principle and agricultural status for evaluation of the economical proficiency, and economical survey and its finalization.
- 3) Contents of designing internals, principles and methods calculating structures, calculation of capacity and stability of headspring structures including dam, hydrological assessment of cross section in canal, the methods of hydrological and structural calculation of waterway structures including siphon, contents of drawing design, assessment of workload.
- 4) Method of estimating budget for design-drawing, cost, composition of total investment, accounting system and method.
- 5) Formatting and assessment/approval of final design documents.



### **Title 3 "Design Method of Controlling Inundation in River and Stream "**

- 1) Technical main points and method of survey for designing river and stream construction.
- 2) Calculation method for selection of bulky water flow and selection of standard water flow.
- 3) Calculation of cross-section of planned waterway in river and stream.
- 4) Calculation of reliability of banks of river and stream and rational selection of position of bank.
- 5) Method of calculating flood level and method for selection of standard water level.
- 6) Calculation of drainage water bulk and calculation method of culvert structure.

### **Title 4 Video lecture**

The video lecture took a coverage of the construction of Kaechon-Taesong Gravity Water Way which was recently built in D.P.R. Korea including the construction of the weir, canal, water way structures, the construction facilities and engineering procedures used from the start to the end and the workers building the hydrological structures.

### **Title 5 Field Practice Training**

The trainees visited the earth dam, concrete dam, outlet structure, canal and its structures, while looking with their own eyes good points and defects in the maintenance of each structure, specific parts of structural solution and rational water way structures.

Practices and the field trainings were made through the visits to the followings.:

- West Sea barrage reservoir dam, outlet barrage, input water gate, Onchon canal and siphon.
- Weir and tunnel/inlet water gate and canal of Kaechon-Taesong Gravity Water Way.
- Sohung-lake concrete dam, power station, canal, regulating gate and siphon of Ojidon irrigation system.
- Earth dam, spillway gate, winch drainage canal, intake tower and outlet tunnel of Unpa reservoir under the Jaeryong irrigation system.
- Chonggye 1<sup>st</sup>-stage pumping stations.



Workshop participants



Workshop-on-the-spot at the Gaechon-Lake  
Taesong Daegak Barrage



Field-Workshop-on-the spot-on Lake SoHung  
Irrigation System



Field-Workshop-on-the spot at the Lake uenpa  
Earth-Dam



Opening ceremony



Professor' s lecture