DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

PEREZ-GUERRERO TRUST FOUND

FINAL REPORT

ON

THE PROJECT INT/98/K03/A95/9: TRAINING OF THE RICE BREEDING EXPERTS FOR THE EFFECTIVE USE OF THE RICE GENETIC RESOURCES IN THE DEVELOPING COUNTRIES

ACADEMY OF AGRICULTURAL SCIENCES

DPR OF KOREA

NOVEMBER, 1999

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I. INTRODUCTION

The Academy of Agricultural Sciences (AAS), Democratic People's Republic of Korea (DPRK) was entrusted to implement the project entitled "Training of the Rice Breeding Experts for the Effective Use of the Rice Genetic Resources in the Developing Countries" which was approved by the Annual Ministerial Meeting of the Group of 77 held in New York in September, 1998. As the project implementing Agency, AAS performed the project activities, as allowed by the budget of US$ 100,000 assured by the Perez-Guerrero Trust Found (PGTF), during the period of February 1 to October 31, 1999.

The project was carried out in two phases; phase I and phase II. The phase I covered the period from February 1 to June 31, 1999 and the phase II from July 1 to October 31, 1999. The interim report of the project was submitted to the Special Unit for TCDC in July 1999 after implementation of the Phase I.

With successful completion of phase I and II activties, this final report was prepared to report the project performance. The document describes the activities for implementation of the PGTF project INT/98/K03/A/95/99, with the project budget details.

II. BACKGROUND

In developing countries, increase of agricultural production is of primary importance to address their food problem and achieve the consolidation of self reliance of the national economy and prosperity of the nation.

Developing country have common interest in promoting the south-south cooperation on the principle of "Collective Self Reliance" so as to attain the food security and be economically self-sufficient. International organizations have already played their role in facilitating the economical and technical cooperation and exchange among these countries.

Rice is the most important food crop in the world. Rice is consumed as a staple food in the developing world. This is the case in African countries, especially West Africa as well as Asian countries. Thus the cooperation and support for increase of rice production deserve to be an fundamental approach to solve the food problem in developing countries. The most feasible and effective way for increasing rice production seems to elevate the rice yield through varietal improvement. The importance and impact of seed improvement were already illustrated by the achievements and experiences presented in the "International Workshop on the Experiences of the DPR of Korea in Getting High and Stable Yield of Rice" held in Pyongyang in September 1982. The participants to the workshop noted that the experience that the DPRK attained the food security even in complicated situations after the Korean War by performing the "Green Revolution" successfully based on its own manpower, is of high worth to be referred, and feasibly adapted to developing countries.

The late President KIM IL SUNG, eternal leader of the Korean people, suggested his concept on the South-South Cooperation, in the conference of Non-Aligned and other developing countries for Improved Food and Agricultural Production and the Meeting of the Agricultural Ministers of African countries organized by his proposal after the conference in Pyongyang in August 1999. Following his concept, the DPRK agricultural scientists and technicians founded agricultural research institutes and experimental stations in several African countries, where cooperative work was actively conducted. From such cooperation new superior crop varieties and technologies suited to the local situation were developed and disseminated, resulting in 5 to 7 times increase of crop production in a short period of time. These practical achievements demonstrated the possibility that the food and agricultural problems faced by developing countries can be solved by realizing the assistance and technical cooperation among themselves, being faithful to the concept of South-South Cooperation.

The DPRK Government proposed this project, being based on his experience in performing "green revolution" and long involvement in the south-south cooperation and also considering the current situations of developing countries.

The project objective was to develop/improve the rice breeding system and methodologies suited to the local situation and train the rice breeders in African countries, Ethiopia, Guinea, Mali and Nigeria. Ultimately, the project was to contribute to develop the local capability of solving the food problem by themselves.

For implementation of the project, the DPRK Government made the sub-contract with AAS in December 1, 1998. The sub-contract document was signed

by Mr. Choi Su-Hon, vice-minister of Ministry of Foreign Affairs (MFA) on behalf of the Government and Mr. Kye Yong-Sam, President of AAS on behalf of AAS.

The phase I of the project was directed towards to assist the recipient countries (RCs) to develop the most effective production technologies and breeding system for high yield of rice. The phase II focused on training the African scientists and technicians to familiarize with knowledge and practical skills required for breeding the rice varieties which enable to get high yield with efficient use of the resources such as soil, heat and water as well as for developing/improving the local breeding system for effective use of rice germplasm.

III. PROJECT ACTIVITIES

III.1. The Phase I Activities

The DPRK Government appointed Mr. So Se-Pyong, Director of Department, MFA as the project coordinator, Mr. Kim Chang-Hwal, Director of Department of Scientific Research Coordination, AAS, Mr. Ri Thae-Sik, Head of team in Rice Research Institute (RRI), AAS and Mr. Kim Chang-Ryop, Rice Breeder of RRI, as chief technical advisers, and Mr. Bang Kwang-Hyok, MFA as the project financier. They were authorized to organize and supervise the executive group of the project (EGP). EGP consisted of 12 scientists with over 20 to 30 years of experience in rice breeding and cultivation and assistants.

Upon approval of the project, EGP commenced its work to prepare the training guidelines and curriculum. The scientists of EGP studied the status of rice germplasm utilization, and ecological conditions of the RCs to write the training manuals and references, which were distributed to them.

For approaching the training to the practical environment prevailing in the RCs, the KIM IL SUNG Agricultural Research Centre in Guinea was selected as the training venue for its involved in the cooperation with AAS for more than 20 years, having already produced the achievements. With the support from AAS and the Government of the Republic of Guinea, the Centre rehabilitated and prepared the lecture room, exhibition, laboratories, field experiments, and others to afford convenience to the trainees during the training.

In order to advise the rice breeding system and production technologies

suited to the RCs, a delegation of Dr. Kim Chang-Hwal, Dr. Ri Thae-Sik and Dr. Kim Chang-Ryon were dispatched to study the situation of Ethiopia, Guinea, Mali and Nigeria from May 18 to June 26, 1999. During the mission, the delegation met the directive staff of agricultural research organizations and visited research centres and stations of the visited countries. The mission provided an excellent opportunity to make familiar with the status and prospective of rice germplasm research and utilization, shared the experiences in rice breeding. The delegation distributed the guidelines for rice germplasm utilization and the programme of the forthcoming training.

The delegation also discussed and made agreement with the local authorities that two or three rice breeding or production specialists be nominated and allowed to attend the training for effective use of rice germplasm to be held at the KIM IL SUNG Agricultural Research Centre in Guinea in October, 1999. Under this agreement, two specialists from Ethiopia were to attend the training, 6 from Guinea, 3 from Mali and 3 from Nigeria.

The reports on travel to each country were attached to the interim report on the project performance already sent.

III.2. The Phase II Activities

EGP prepared the lectures on the subjects selected from consideration of the status of rice germplasm utilization and production in the RCs. For conducting the training, a delegation of Dr. Ri Thae-Sik, rice breeders, Dr. Kim Tok-Yong and Dr. Han Hung-Chol had a mission at the KIM IL SUNG Agricultural Research Centre in Guinea. Under their supervision, all the preparations for the training were finalized. Based on such preparative work, the training of the Rice Breeding Experts for the Effective Use of the Rice Genetic

resources in the Developing Countries, was conducted at the KIM IL SUNG Agricultural Research Centre in Guinea from October 18 to 27, 1999.

The training started with the opening ceremony. The ceremony was chaired by Mr. Salip Kamara, director of the Centre, Dr. Ri Thae-Sik made the opening address, followed by the congratulation addresses from Mr. Pak Chan Sok, DPRK embassador extraordinary and plenipotentiary to Guinea and Mr. Usuman Kamara, governor of Kindia Province. The lectures to the training from AAS and the trainees from four countries, Ethiopia, Guinea, Mali and Nigeria were introduced, with the training program announced. After the ceremony, the participants visited the centre, being exposed to its achievements, especially, rice varieties suitable for the climatic and soil conditions of the region which were already disseminated to Guinea and other African countries with remarkable increase of rice yield.

The training was attended by 14 trainees from Ethiopia, Guinea, Mali and Nigeria. In addition to these trainees, 15 Guinea scientists were allowed to attend the training as requested by the relevant Guinea authority. The list of trainees, training program and curriculum were attached in Annex I, II and III, respectively. The training was carried out in combination of the oral lectures, exercises and field trip. The status and prospective of rice breeding research and production of each participating country were presented during the training, which was served as a forum for discussing and sharing their experiences as well as the local problems and challenges in rice breeding and production.

During the training, the trainees were invited to visit the field experiments of the KIM IL SUNG Agricultural Research Centre in Guinea and the Guinea Tropical Fruit Institute in Foulaya.

The training manuals and references in English and French for 18 subjects were distributed to each trainee, with a total of 252 copies. The training curriculum was fully carried out as originally planned; 19 lectures for 13 subjects, 8 exercise lectures for 4 subjects and two visits with a total of 36 lectures for 24 subjects. After lectures each day one or two hours were devoted for questioning and answering at the lecture room or hotel, which was found very helpful for better understanding what they learnt from the lectures and finding its application in rice breeding practice. Upon request from the trainees, additional lectures like "Epistasis and Plant Breeding" were also delivered.

The training was performed successfully as envisaged. According to the trainees, the training focused on such number of subject of practical importance that the gains could be comparable to those from a college course of rice breeding. Especially, the training was impressive in that it allowed the trainees to make themselves familiar with the hybridization techniques of rice breeding that should be shared with their colleague rice breeders and intensively practiced upon returning to their countries. The trainees appreciated the efforts of the DPRK and PGTF devoted to make the training successful and fruitful to learn the technologies which are urgently needed to improve rice production in African Countries. They ascribed the success of the training to the result of successful cooperation between PGTF and the DPRK which has attached importance to the south-south cooperation, having his own achievements and capabilities.

Noting that the DPRK has actively participated into the south-south cooperation, they acknowledged the efforts of the late President KIM IL SUNG who indicated that the priority of the south-south cooperation should be given to

agricultural sector and created the model of the south-south cooperation in African countries. They also expressed their thanks to the General KIM JONG IL, great leader of the Korean people for his attention to successful sponsoring the training, directing to further develop the south-south cooperation as the President used to do. The trainee sent the letter to AAS, sponsor of the training, keenly requesting to organize further training for African scientists. The copy of the letter was attached in Annex IV.

The training ended with the closing ceremony. The closing ceremony was attended by the Government of the Kindia Province, officials of the Guinea Ministry of Agriculture, staff of Guinea agricultural research centres and stations together with the trainees and lecturers. The DRPK embassador, other embassy members and AAS scientists working at the KIM IL SUNG agricultural research centre in Guinea also attended the ceremony. In the ceremony, Dr. Ri Thae-Sik made the closing address, followed by the congratulation addresses by the Governor of Kindia Province and a Nigerian trainee. The certificate of attendance to the training was given to each trainee.

The training manual (in English), newspaper reports and photographs for the training were enclosed.

IV. PROJECT OUTPUT

IV.1. The improved local system capable to effectively utilize and introduce rice germplasm in the RCs.

a) Provision of the guidelines for rice germplasm evaluation, selection, improvement and seed production which were prepared considering the geographical and climatic conditions, current status of rice production and germplasm availability in the RCs.

b) The system of information, introduction and dissemination of rice germplasm for release of the varieties suited to the ecological zones of the RCs.

c) The improved rice breeding system where the hybridization techniques are intensively adopted with selection practical in specific agroecological zones of the RCs.

d) The capability of breeding for resistance disease like rice blast and bacterial blight which are one of the major constraints in rice production of the RCs.

IV.2. Fourteen rice breeders trained in the knowledge and skills for breeding high yielding rice varieties who are to be the core staff of the local rice

breeding system.

IV.3. Provision of the instruction of rice breeding experiments for 13 subject and the training manual of 19 subjects which can be used as the references for local training programs as well.

IV.4.The improved capability of the KIM IL SUNG Agricultural Research Centre in Guinea as the base for training African agricultural scientists in maize and other crops as well as rice.

V. CONCLUSION AND RECOMMENDATION

Through implementation of the project, AAS was convinced that the food problem faced by the developing world can be tackled by realizing and furthering the south-south cooperation in the fields of agricultural sciences and technologies. Trained manpower is considered to play a decisive role in solving the food problem in African countries. In this region where rice is a relatively new crop with a vast potential for increase of rice production, organization of further training of local rice breeders are necessary to increase rice production. Along with this, such training should be extended to cover other cereal crops such as maize, sorghum and soybean which are the staple food crop in several African countries. In this regard, AAS is fully committed to further develop the cooperation with the PGTF to train plant breeders and other agricultural scientists for developing countries.

As summarized above, AAS would like to inform that the project was performed successfully as planned.

VI. PROJECT BUDGET

(US$)

		Planned	Actual
1.	**Personnel**		
	Project coordinator	2,000	2,000
	Consultants	38,000	38,000
	Trainees	10,000	10,000
2.	**Travel**	45,000	45,000
3.	**Miscellaneous**		
	Preparation of experimental plots	1,700	1,700
	Tools and chemicals	1,000	1,000
	Documentation	800	800
	Data processing	1,500	1,500
	Total	100,000	100,000
lst remittance			50,000
2nd remittance			40,000
Total			90,000
Balance			10,000

Annex-I

LIST OF TRAINEES

1. Ethiopia

1)Mr.Toshale Assefa	Head, Pawe Agricultural Research Centre(PARC)
2) Mr.Taye Haile	Rice breeder, PARC

2. Guinea

1) Dr.Mamadou Sidibe,	Head of rice section, KIM IL SUNG Agricultural Research Centre in Guinea
2) Mr.Morlaye Kindio Soumah	Rice breeder, KIM IL SUNG Agricultural Research Centre in Guinea
3) Mr.Mouse Camara	Rice breeder, KIM IL SUNG Agricultural Research Centre in Guinea
4) Mr.Abdoul Karim Camara	Researcher, Koba Agricultural Research Centre
5) Mr.Para Camara	Chief, Seredou Agricultural Research Centre
6) Mr.Sekou Keita	Chief, Bordo Agricultural Research Centre

3. Mali

1)	Dr.Seydou Keita	Director of National Seeds
2)	Mr.Dore Guindo	Chief, Agricultural Research Centre in Niono
3)	Mr.Diokamady Dial	Chief of Seed Laboratory

4. Nigeria

1)	Mr.J.K.Kehindo	Rice production specialist, Agricultural Research Institute(ARI)
2)	Mr.A.T.Maji	Rice breeder, ARI
3)	Mr.A.S.Gana	Rice breeder, ARI

Annex-II

THE TRAINING PROGRAMME

A. Daily Schedule during the Training

Breakfast	by 7:30
Preparation for lectures	8.00 to 8:40
Lectures	9.00 to 12:30 (one break)
Lunch	12.30 to 13.30
Lectures	13.30 to 15.00
Supper	19.00 to 21.00

B. Training Programme

October 16-17

Arrival in Kindia, Guinea of the trainees
2 persons from Ethiopia
3 persons from Mali
3 person from Nigeria

October 18 Monday

Opening ceremony
Venue: KIM IL SUNG Agricultural Research Centre in Guinea.

October 19 Tuesday

Morning: Lectures;

- Status and prospect of the rice breeding and production in the Democratic People's Republic of Korea.
- The collection and utilization of rice germplasm.

Afternoon: Lectures;
- The introduction method of rice breeding.

October 20 Wednesday

Morning: Lectures;
- Genetic basis of hybridization method of breeding and techniques of crossing for rice.
- The pedigree method of rice breeding.

Afternoon: Lectures;
- Status and prospect of the rice farming in the Republic of Guinea

October 21 Thursday

Morning: Lectures;
- Principles and procedures of the bulk method and the mass-pedigree method of rice breeding.
- Production of the breeder' and foundation seeds of rice

Afternoon: Lecture;
- Preparation and use of the field books for different growth stages of rice.
- Status and prospect of the rice farming in the Republic of Ethiopia.

October 22 Friday

Morning: Lecture;
- The evaluation of resistance to diseases in rice.
- Testing for lodging.

Afternoon: Visit to the Guinea Tropical fruit institute in Foulaya.

14:00	Departure
15:00	Visit
17:30	Arrival at the Hotel

October 23 Saturday

Morning: Exercise;

- Techniques for crossing of rice.

Afternoon: Rest

October 24 Sunday

Rest

October 25 Monday

Morning: Lectures;

- Testing for sensitivity to photoperiod.
- Statistical analysis of the data from yield trials.
- Designing and reviewing the rice breeding programmes.

Afternoon: Lectures;

- Status and prospect of the rice farming in the Republic of Mali.
- Status and prospect of the rice farming in the Republic of Nigeria.

October 26 Tuesday

Morning: Exercise;

- Seedbed preparation and seeding for rice breeding work.
- Techniques of blocking and transplanting for rice breeding experiments.
- Plot management of rice breeding experiments.

Preparation of the draft of opinions and recommendation for the training.

Afternoon:

- Finalizing the recommendation.
- Preparation for departure.

October 27 Wednesday

Morning: Closing ceremony.

Venue: KIM IL SUNG Agricultural Research Centre in Guinea.

Departure of 3 Mali trainees.

October 28 Thursday

Departure of 2 Ethiopian trainees and 3 Nigerian trainees.

Annex III

THE CURRICULUM
for
the International Training of the Rice Breeding Experts for the Effective Use of the Rice Genetic Resources in the Developing Countries.

Total Number of Lectures:	**36**
Theoretical lecture:	**19 (13 subjects)**
Exercise lecture:	**8 (4 subjects)**
Presentation:	**5 (from 5 countries)**
Visit:	**4 (2 locations)**

Syllabus

Lecture:

Part I. Designing and reviewing the rice breeding program

1. Designing the rice breeding program (1 lecture)
2. Reviewing the rice breeding performed (1 lecture)

Part II. Principles and methods of rice breeding

1. The collection and utilization of rice germplasm (2 lectures)
2. The introduction method of rice breeding (1 lecture)
3. Genetic basis of hybridization method of breeding and techniques of crossing for rice (2 lectures)
4. The pedigree method of rice breeding (1 lecture)

5. Principles and procedures of the bulk method and the mass-pedigree method of rice breeding(2 lectures)
6. Production of the breeder's and foundation seeds of rice (1 lecture)

Part III. Plot management and techniques for rice breeding (exercise)

1. Seedbed preparation and seeding for rice breeding work (2 lectures)
2. Technique of blocking and transplanting for rice breeding experiments(1 lecture)
3. Plot management of rice breeding experiments (2 lectures)
4. Techniques for crossing of rice (3 lectures)

Part IV. Survey of traits for rice breeding

1. Preparation and use of the field books for different growth stages of rice (2 lectures)
2. The evaluation of resistance to diseases in rice (1 lecture)
3. Testing for lodging (1 lecture)
4. Testing for sensitivity to photoperiod (1 lecture)
5. Statistical analysis of the data from yield trials

Presentation

1. Status and prospect of the rice breeding and production in the Democratic People's Republic of Korea (1 lecture)
2. Status and prospect of the rice farming in the Republic of Ethiopia (1 lecture)
3. Status and prospect of the rice farming in the Republic of Guinea (1 lecture)
4. Status and prospect of the rice farming in the Republic of Mali (1 lecture)

5. Status and prospect of the rice farming in the Republic of Nigeria (1 lecture)

Visit

1. Visit to the KIM IL SUNG Agricultural Research Centre in Guinea
2. Visit to the Guinea Tropical Fruit Institute in Foulaya

Total **36 lectures**

Annex IV

LETTER OF ACKNOWLEDGEMENT

To: **The Academy of Agricultural Sciences, D.P.R. of Korea**

From: **The trainees of the International Training of the Rice Breeding Experts for the Effective Use of the Rice Genetic Resources in the Developing Countries**

Date: **October 27, 1999**

The participants to the International Training of the Rice Breeding Experts for the Effective Use of the Rice Genetic Resources in the Developing Countries would like to express their sincere thanks to the Academy of Agricultural Sciences, D.P.R. of Korea for its successful sponsorship of the training supported by the Perez-Guerrero Trust Fund of the Group of 77.

The training was attended by the scientists from Ethiopia, Guinea, Mali and Nigeria, which was found very useful to share the knowledges, skills and experiences of practical importance for rice germplasm development and utilization to increase the rice production in the participant's countries.

Noting that the achievements and experiences in plant breeding of the DPRK are to be shared by the scientists of the developing countries, the participants recognized that further training in other crops like maize as well as seed production and other areas, if any, will be helpful to improve the agricultural science and technology and thus the food production to contribute the self sufficiency in food. The DPRK might be the most suitable venue for such training.

Alternatively, the training may be conducted in other appropriate developing countries. For maximum benefits from such training, it is desirable to appropriately combine practical exercises and field trips with theoretical training.

The participants are willing to develop the cooperation and collaboration with the Academy of Agricultural Sciences, DPR of Korea through invitation of the scientists as practiced in the KIM IL SUNG Agricultural Research Centre in Guinea.

The participants hope the active cooperation and support from the Academy of Agricultural Sciences, DPR of Korea.

Thanks again for successful organization of the training and arrangement of the competent lectures.

With best regards.

On be half of the Ethiopian participants:

Taye Haile Simile

On be half of the Guinea participants:

Mamadou Sidibé

On be half of the Malian participants:

Keita Seidou

On be half of the Nigerian participants:

Julius Kolawole Kehinde

MINISTERE DE L 'AGRICULTURE
ET DE L 'ELEVAGE

INSTITUT DE RECHERCHE
AGRONOMIQUES DE GUINEE

CENTRE DE RECHERCHE AGRONOMIQUE
KIM IL SUNG DE KILISSI

REPUBLIQUE DE GUINEE

Travail-Justice-Solidarité

Conakry, le 27 Octobre 1999

C E [illegible] E I C A T

M. Julius Ko[illegible] – Nigéria

A suivi avec succès le cours International sur la sélectio[illegible]rv[illegible]on des ressourcesphytogénétiques,organisé par l 'Institut de Recherche agronomique [illegible]UIN[illegible]E; du 18 au 27 Octobre 1999

En Foi de quoi, le présent Certificat lui [illegible]r servir et valoir ce que de droit.

Au nom de l 'Académie agricole
de la R.P.D. de Corée

Ri Theesik

Le Direc[illegible]ntre

C.R. M A E F - I R A G. KINDIA
Le Directeur
"KIM IL SUNG" DE KILI[illegible]

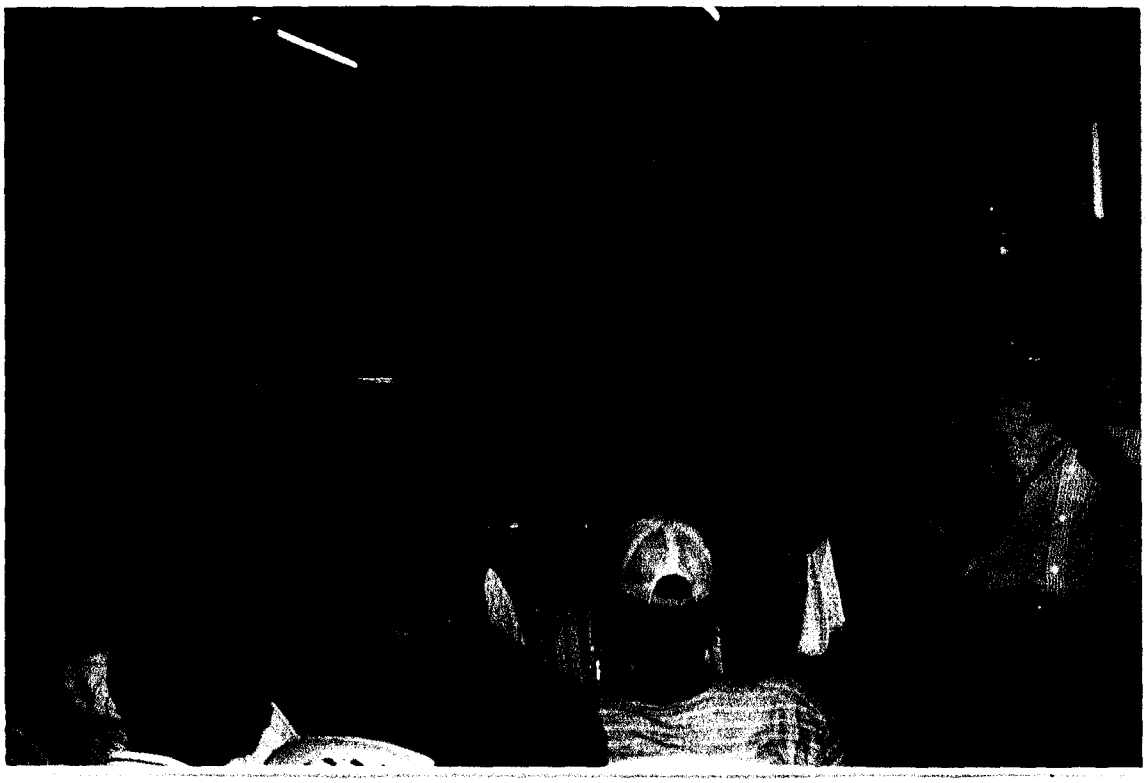
Salifou CAMARA

Le Directeur Général de l 'IRAG

Institut de recherche agronomique de Guinée
IRAG
le Directeur

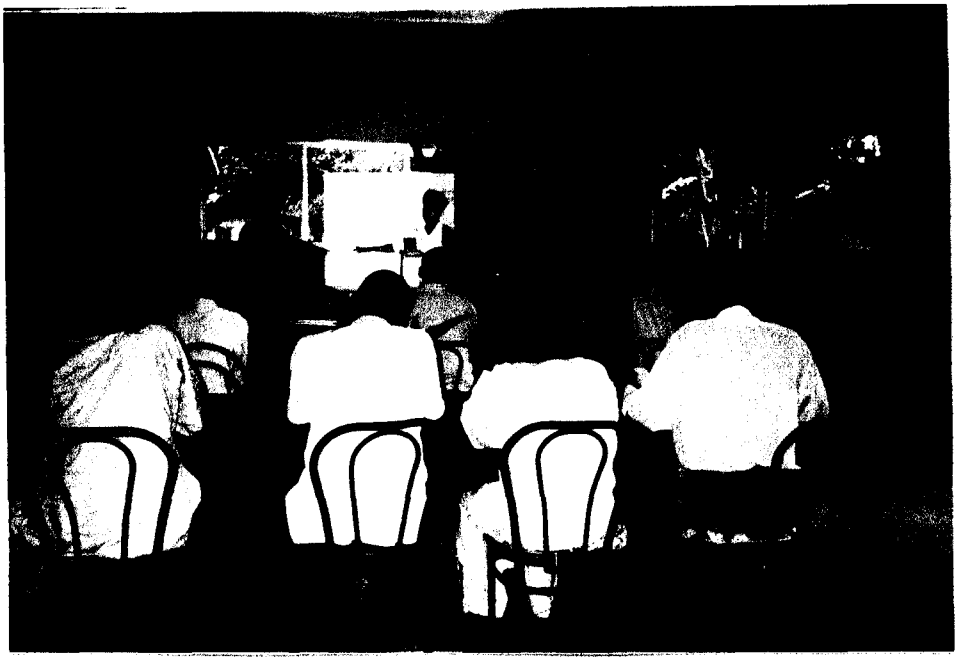
Dr. Sékou CISSE

Fait à Idéal Services



OPENING CEREMONY

PARTICIPANTS TO THE OPENING CEREMONY



A LECTURE

PRACTICE IN THE FIELD

A VISITING TO THE KIM IL SUNG AGRICULTURAL RESEARCH CENTRE IN GUINEA