

PROMOTING RICE “*FROM PLANT TO PLATE*” FOR FOOD SECURITY IN SUB-SAHARAN AFRICA: SG2000’S STRATEGY

By

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SUMMARY

Fourteen Countries in Sub-Saharan Africa (SSA) import more than 6 million metric tons (MT) of rice annually in addition to the over 12 million MT produced locally (FAOSTAT 2005). These two simple facts indicate that (1) rice is an important staple food crop in many parts of SSA (2) that SSA is food insecure in rice and (3) SSA loses over one billion USD in foreign exchange annually. Nigeria, Madagascar, Guinea, Ivory Coast and Tanzania constitute part of the leading rice producing countries (production range: 700,000-5,000,000mt) while Nigeria, Senegal, South Africa, Ivory Coast and Ghana are the five leading importers (importation range: 700,000-1,800,000MT).

The rice deficit situation in SSA can be remedied only and only if the Region can put all its efforts and resources to increase productivity and quality such that sufficient quantities of rice of equal or superior quality (grain size, color, aroma, taste, etc.) as that of the imported rice are produced locally and put in place policies and incentives such that prices of rice are attractive to farmers, traders and consumers.

Improvements in productivity and quality have to be accomplished in four stages (no short cut): I. Breeding and Selection; II. Cultural (Agronomic) practices; III. Post- harvest handling and IV. Processing, marketing and utilization. All four stages are equally important for the increase in productivity per unit area/time, for adding value to the produce so that it can be sold at a higher price thus increasing farm income and improving the quality such that consumer satisfaction is also guaranteed.

Sasakawa Africa Association (SAA), through its Regional Implementing Project, Sasakawa Global 2000 (SG2000) has decided to consider rice as a strategic crop for Food Security in SSA. It has selected four focus countries – Ethiopia, Mali, Nigeria and Uganda - for the 2005-2010 period. Maximum efforts will be applied such that these four countries will be self-sufficient and food secure in rice with the possibility of some of them becoming exporters.

The Regional Rice Program will strive to put science into agriculture and to focus on the following activities. This is to be accomplished in close collaboration with the Africa Rice Center (WARDA) the International Rice Research Institute (IRRI), the Africa Rice Initiative (ARI), the Forum for Agricultural Research in Africa (FARA), Regional WARDA and IRRI affiliates and networks, National Agricultural Research and Extension Services (NARES) and other concerned development agencies. It will:

- Identify and support the evaluation of new improved and broadly adapted rice varieties from WARDA, IRRI and other sources;
- Support the maintenance, production and availability of good seed of improved varieties in collaboration with NARES;
- Promote productivity enhancing technologies;
- Promote post-harvest and agro-processing technologies;
- Support the training of young rice scientists and field technicians; and

- Bridge closer partnerships and promoting collaborations among WARDA, IRRI, IITA, CIMMYT, ICRAF, ADB, WB, FAO, JICA/JIRCAS, FARA to mention a few.
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Stage I. Breeding and Selection

Generally, there are strong programs of breeding and selection in many African countries. Even those that do not have strong breeding programs can usually get segregating materials from other breeders or international centers and select varieties that fit to their own ecologies. The Africa Rice Center has done an excellent job in breeding and selection of the original Rain-fed Upland NERICAs and is continuing to develop Rain-fed Lowland NERICAs. The Rain-fed Upland NERICAs are already a success in several African Countries including Guinea, Siera Leone, Ivory Coast, Gambia, Uganda, and Ethiopia to cite few examples. The Guinea success story was reported in Babagalle et al. 2004. (JICA Proceedings) There is no doubt that the NERICAs are a success. The following photos demonstrate the performance of the NERICAs in three countries: Guinea, Ethiopia and Uganda during 2004 - 2005. This is just to illustrate that the breeding and selection aspect is in place and does not pose a big problem at the moment. More urgent problems that need to be addressed immediately will be pointed out in this paper.





UGANDA 2005





MALI 2005





ETHIOPIA 2005



Improved Breeder Seeds are usually available in breeder's hands, at National and International Centers. Seed Production efforts are present in many countries. However, quantity (sometimes even quality) is not sufficient to satisfy farmers' needs. Accessibility is also a problem in many cases.



Breeder Seed – Africa Rice Center

4a. SEED PRODUCTION

MAINTAINANCE OF SEED PURITY OF THE NERICAS AT RESEARCH STATIONS AND AT FARM LEVEL



Quality Seed Production - Guinea

SG2000 is currently testing more than 60 inter-and intra-specific elite lines in Mali, Ethiopia and Uganda. These were obtained from WARDA. Another 18 high altitude, cold tolerant varieties from IRRI, The Philippine National Research Institute and Madagascar are under evaluation in Ethiopia while 13 Guinean varieties were sent to Ethiopia, Madagascar and Tanzania for evaluation by National Breeders.

Stage II. Agronomy

A lot remains to be studied in NERICA agronomy. Due to their high yield potential, NERICAs demand the use of commercial fertilizers in addition to that provided by compost, alley-cropping and residual effects from rotations that may be developed with nitrogen fixing legumes. It is also necessary to develop plant density, planting date, fertilizer dose and time of application, etc. recommendations for the NERICAs. JICA agronomists in Uganda, Guinea, Ethiopia, etc. have already started excellent studies on those lines which are very encouraging. Some specific aspects that need to be looked at in relation to the NERICAs include: balanced nutrient management, water management, cold tolerance and adaptability to various altitudes, tolerance/response to acidic and alkaline soil conditions –and also the influence of different kinds of fertilizers, especially micro-nutrients such as sulfur, zinc and magnesium on seed filling and nutritional quality. According to Doberman and Fairhurst (2000) rice is affected by various toxicity conditions : iron, sulfide, boron manganese, aluminum, etc. IFA (January 2005) also reports that potassium plays a critical role in mitigating the effect of stresses such as drought, salinity, pests and disease. In soybeans, it plays a vital role in grain filling. Some images are included below for reasons of demonstrating some responses that have been already observed with the NERICAs in different countries of SSA.



Response to chemical fertilizer – Faranah, Guinea, 2004



No fertilizer & fertilized plots in alkaline (salty) soils, Gode, Ethiopia, 2005



NERICAs in Finote Selam, Ethiopia, 2,000m asl - 125 days after planting but no heads yet. In lower altitudes, NERICAs fully mature in 90-100 days (note the mature wheat) in the background.

Stage III. Post Harvest Handling

The importance of this stage cannot be over-emphasized. Unless good care is taken for the rice crop during harvesting, drying, threshing, pre-storage/processing drying, all gains made during the first two stages can be mostly or entirely lost due to prevailing unfavorable environmental conditions (moisture, insects, rodents). Unfortunately, the post harvest and agro-processing activities in many SSA countries leave a lot to be desired. Examples of hand harvesting and threshing in Madagascar and Tanzania are presented below as examples. The deplorable drying methods on asphalted highways are from Guinea. Similar drying methods were observed in Nigeria. There is no way that rice handled in such a manner can have good market quality. It is time that African countries wake up and improve on quality. In the last 10 or more years, SAA and SG 2000 in collaboration with IITA has been trying to promote improved post harvest and agro-processing technologies in several countries.

These efforts continue to date and will be even increased in the years to come. Activities include: local manufacturers' training, manufacturing of post harvest machines in place and also training the machines users/operators. So far countries

that have benefited such privilege include: Ghana, Benin, Guinea, Ethiopia, Mali and Uganda.



Post harvest activities in Madagascar (top) and Tanzania (bottom)



Manufacturers training in Uganda, 2004



Rice threshing demonstration in Ethiopia

IV. Processing, marketing and utilization

It is important that the final product is attractive both to the seller and buyer/consumer. That's the only way that African rice can compete with imported rice both at market and consumer levels.

Stages II (Agronomy) and III (Post Harvest Handling) greatly determine the quality of the material to be processed. If the produce is already poor before processing, then there is not much that processing can do to improve the quality and add value to the product. It is only when the pre-processing produce is good that additional care in processing can contribute much to come up with good quality final product that will satisfy the seller and the buyer (customer/consumer). When the two are satisfied, the farmer gets more money. Much remains to be done in this area. Packaging and Regional market development/information are still untouched. One cannot find much (if any) processed rice products in African Markets. Rice is sold as polished grain and consumed boiled.



Pre-polishing drying on asphalt road, Guinea



Improved drying on black plastic , Guinea



Manual rice polishing in Guinea



Rice thresher and polisher under demonstration by SG2000 technicians in Guinea



Imported Rice in Eastern Ethiopia



Rice Foods, Central Ethiopia

CONCLUSIONS

Rice is an important staple food crop in many SSA Countries. However, most of them do not produce enough and therefore are food insecure. A lot of rice is imported to fill the gap denying the importing countries a lot of foreign exchange which they badly need. The best solution for this problem is for SSA to make improvements in rice production, post-harvest, processing and utilization technologies so that locally produced rice can compete in quantity and quality with the imported ones. Such actions will help increase farmers' incomes, satisfy rice consumers and contribute to the economies of the SSA countries.

SAA and SG2000 will continue to support programs and activities that engage in these lines. The authors are fully convinced that with close collaboration and partnerships of all concerned National, Regional and International institutions, it is possible to drastically reduce or even eliminate rice importation in SSA. The actions to be taken must include all the four stages, that is, breeding and selection, agronomy, post harvest and processing, marketing information and utilization promotion. Collaboration and partnerships are the key to success in this endeavor. There is hope since all the relevant International Centers (WARD, IRRI, CIMMYT, IITA, etc,) and donors (WB, JICA, UNDP, IFAD, ADB, FAO, etc.) are now convinced that rice, particularly the NERICAs, can contribute to food and nutrition security in SSA and are now focusing their attention towards helping farmers and increasing food and nutrition security in SSA. SAA, through its implementing SG2000 Regional Rice Program will join hands in that effort.



It is hoped that by the year 2010, several SSA countries will attain food self-sufficiency and food security

References

CASIN/SAA/Global 2000. 1999. Partnerships for Rural Development in Sub-Saharan Africa. Proceedings of a Workshop held in Villar-sur Ollon, Switzerland, September 11-15, 1998. 118p.

CASIN/SAA/Global 2000. 2000. The Food Chain in Sub-Saharan Africa. Proceedings of the Workshop held in Bamako, Mali, October 15-19, 1999. 182p.

CASIN/SAA/Global 2000. 2002. Food Security in a Changing Africa. Proceedings of the Workshop on Africa Food Security in a Changing Environment: Sharing Good Practices and Experiences held in Kampala, Uganda, June 6-9, 2001. 219p.

CIMMYT. Annual Report 2002-2004. Innovation for Development. 54p.

CIMMYT. Annual Report 2003-2004. Adding Value for Development.

CIMMYT. 2004. Seeds of Innovation. 56p.

Defoer, T., M. C. S. Whopereis, M. P. Jones, F. Lancon and O. Ernstein. 2002. Challenges, Innovation and Change: Towards Rice-Based Food Security in Sub-Saharan Africa. Article presented at the 20th Session of International Rice Commission, Bangkok 23-25 July 2002. 25p.

Doberman, A. and T. Fairhurst. 2000. Rice: Nutrient Disorders & Nutrient Management. IRRI, Potash and Phosphate Institute/Potash & Phosphate Institute of Canada. ISBN 981-04-2742-5. 192p.

FAOSTAT, January 2005.

JICA, 2004. Proceedings of Seminar on the Promotion of Rice Production and Dissemination in Africa. AICAD, Nairobi, Kenya, February 2004. 388p.

SAA. 2004. Annual Report 2002-2003.

SAA. 2004. From Subsistence to Sustainable Agriculture in Africa: Policies, Strategies and Implementation. Proceedings of a Workshop held in Johannesburg, South Africa, 18-19 November 2002. 138p.

WARDA. 1996. Rice Trends in Sub-Saharan Africa: a synthesis of statistics on rice production, trade and consumption (1973-1992).

WARDA. 2001. Spread of NERICAs in Guinea: Towards Food Security. The History and Keys of Success. 10p.

WARDA. 2002. Promising Technologies for Rice Production in West and Central Africa. 28p.

WARDA. 2002. The African Rice Initiative: Towards Poverty Reduction in Sub-Saharan Africa, A Consortium for a NERICA-Based Food Security in Sub-Saharan Africa. Proceedings of Launching Ceremony held at Yamoussoukro, Ivory Coast, 26-27 May 2002.

WARDA. 2003. NERICA at TICAD III.

WARDA. 2004. Strategic Plan 2003-2012. 56p.

WARDA. 2004. Annual Report 2002-2003. 87p.