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Sawah rice production system as eco-technology for sustainable management of resources and land in Nigeria and Ghana

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Introduction

- Rice consumption has expanded in West Africa
- Though rice contributes a significant proportion of the food requirements of the West African population, production capacity is far below national requirements.
- To meet the increasing demand, the importation of milled rice was used to bridge the gap between domestic demand and supply.
- The Expert Consultation on Yield Gap and Productivity Decline in Rice Production by FAO which recognized that there is a sizable rice yield gap between attainable and actual farm yield.

Introduction

- In Sub Sahara Africa, rice yield is even worse than half of the world average, and there is a potentiality to improve rice yield considerably.
- Since the introduction of higher yielding Asian rice varieties into Africa in the 15th century and after, Asian one is planted in almost all parts of the continent.
- But because cultivation method is still the traditional system, that is, planting rice in upland farms, the mean yield including irrigated rice has remained about 1.6 t/h in the past 30 years.
- Inland valley bottoms and hydromorphic fringes cover about 50 million hectares in West Africa of which about 10 million hectares have potential for small-scale irrigated sawah based rice farming.

Rice production situation in Nigeria

Nigeria is the largest country in West Africa, with the largest rice producing area in Africa.

Despite the potential for rice production and possible exportation, the potential has not been transformed into actual production

Principal constraints identified in past studies are poor soil fertility, poor water management and poor varieties.

With the improved and research break through of IITA and WARDA, the constraint of poor varieties has been eliminated.

However, the existing improved varieties need improved water management and soil fertility conditions before the expected yield can be realized.

Rice production scenario in Ghana

In Ghana, potential area for small-scale irrigated sawah in Inland Valley Watershed is high

It is estimated as 700,000 hectares, representing 3% of total land area, 1-3% of Guinea Savanna Zone and 3-5% of Forest Zone.

If flood plain, are included total potential area for irrigated sawah may reach up to one million hectares in Ghana.

Applying sawah rice producing technology is one of the solutions

The Ghana government has constructed 22 large-scale irrigation facilities with rice grown as a major crop on 12 fields of them

Sawah intervention

The potential of Sawah based rice farming is enormous in West Africa in order to stimulate the long awaited green revolution.

This is predicated on the fact that the agro-ecological conditions of the core region of West Africa are quite similar to those of northeastern Thailand, which is one of the rice center in the country.

Ten to twenty million ha of sawah can produce additional food for more than 300 million people in future.

Sawah based rice farming can overcome soil fertility problems through the enhancement of the geological fertilization process, conserving water resources, and the high performance multi-functionality of wetlands.

Sawah Intervention

The term sawah refers to leveled and bunded rice fields with inlet and outlet connecting irrigation and drainage.

Sawah projects in West Africa was introduced by Japanese institutions

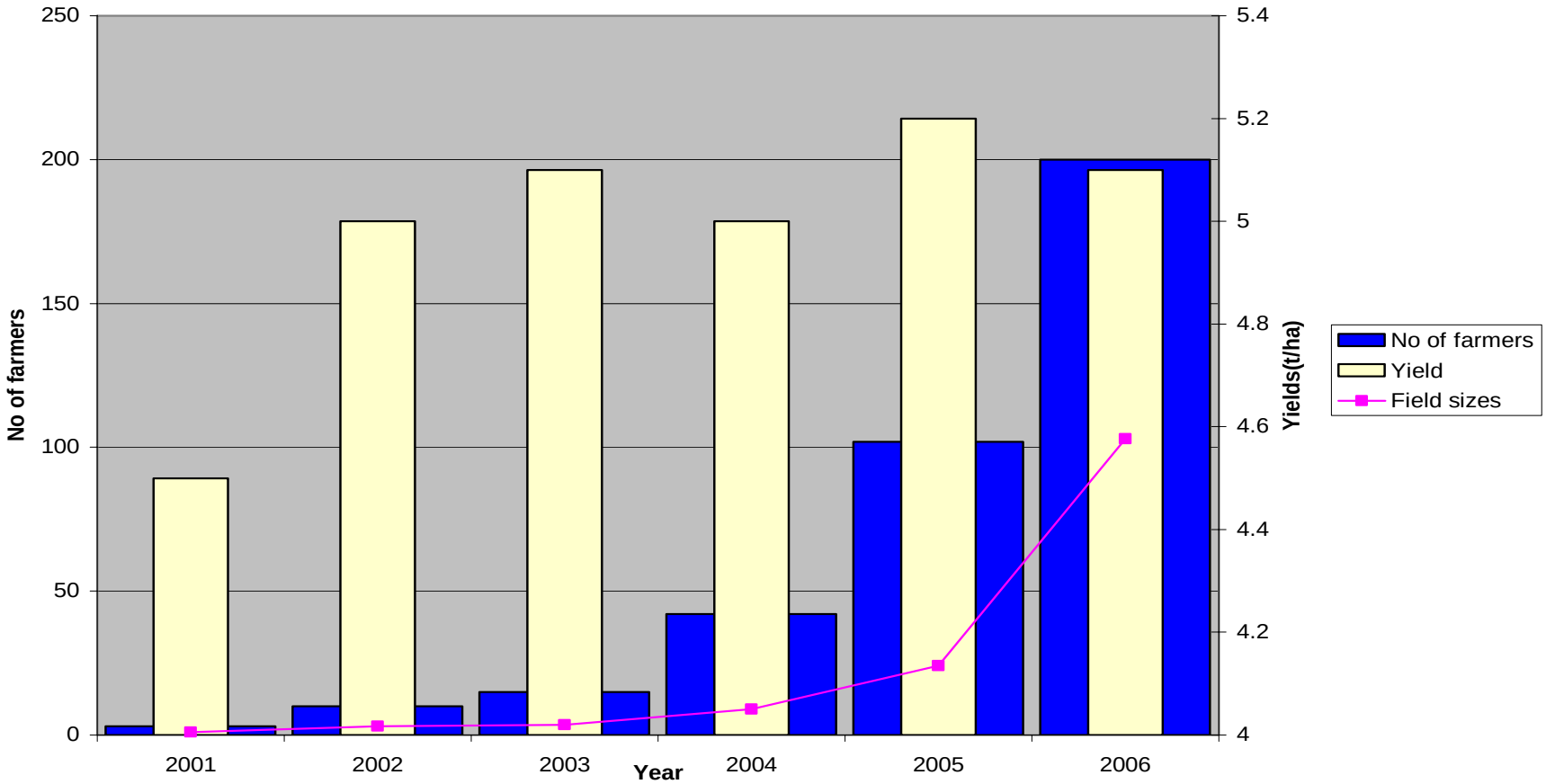
- **Integrated Watershed Management of Inland Valleys by JICA - CRI**
- **Sawah project by SRI - Shimane University**
- **Kinki University Japan (2002 -2004) and**
- **Inland Valley Rice Development Project by MOFA – ADB**

The goal is the development of sustainable production systems of the whole watershed, which allows intensification and diversification of the lowland production system and stabilizing improved production systems on the upland.

Rudimentary/traditional practice

Recommended sawah practice

Trend of sawah yields and adoption among farmers in Nigeria



Rate of increase in number of farmers, field sizes and yield on sawah

Mean Paddy Grain yield (t/ha) among farmers group adopting Sawah technology from 2001 -2005 in Ghana

Farmers group	2001	2002	2003	2004	2005
Adugyama A	4.0	4.7	3.8*	5.0	4.5*
Adugyama B	4.4	4.8	5.5	5.5	4.8*
Biemso A	4.8	4.7	4.8	5.5	-
Biemso B	4.7	5.7	5.9	6.5	5.4
Biemso C	-	4.5	5.4	5.5	5.5
Mean	4.5	4.9	5.1	5.6	5.1
SE	0.18	0.21	0.36	0.24	0.24
Traditional system	0.9	1.0	1.0	1.1	1.1

* Fields partially destroyed by late floods

Conclusion

- This paper has demonstrated that sawah rice production technology is improving the yields among farmers in Nigeria and Ghana

- It is also serving to preserve the environment.

- As it is necessary to enhance the food production base for food security in Nigeria and Ghana, due to future population increase. It is therefore important to explore the lowlands of the inland valleys from its use status.

- The introduction of the rice field with proper field management and the water management can be done as described in the paper.

- It will be useful for agricultural development in Nigeria and Ghana to encourage such practice, and to derive the lesson from a follow-up survey and a continuous observation.