POTENTIAL OF INCREASING RICE PRODUCTION IN NIGERIA THROUGH SAWAH ECO-TECHNOLOGY

ADEMILUYI Y. SEGUN (PHD)
NATIONAL COORDINATOR,
NEW SAWAH PROJECT,
NATIONAL CENTRE FOR AGRICULTURAL MECHANIZATION
(NCAM)

INTRODUCTION

Nigeria has the potential to be self-sufficient in rice production, both for food and industrial raw material needs and export. However, this potential has not been met. Self-sufficiency in rice production has eluded Nigeria for a long time despite over 40 years of efforts by the Government of Nigeria towards its realization.

INTRODUCTION CONT'D

In order to increase food production and alleviate the widespread poverty in Sub-Sahara Africa (SSA), given the limited possibility for expansion of cultivable area and increase in population, there is need for a Green Revolution

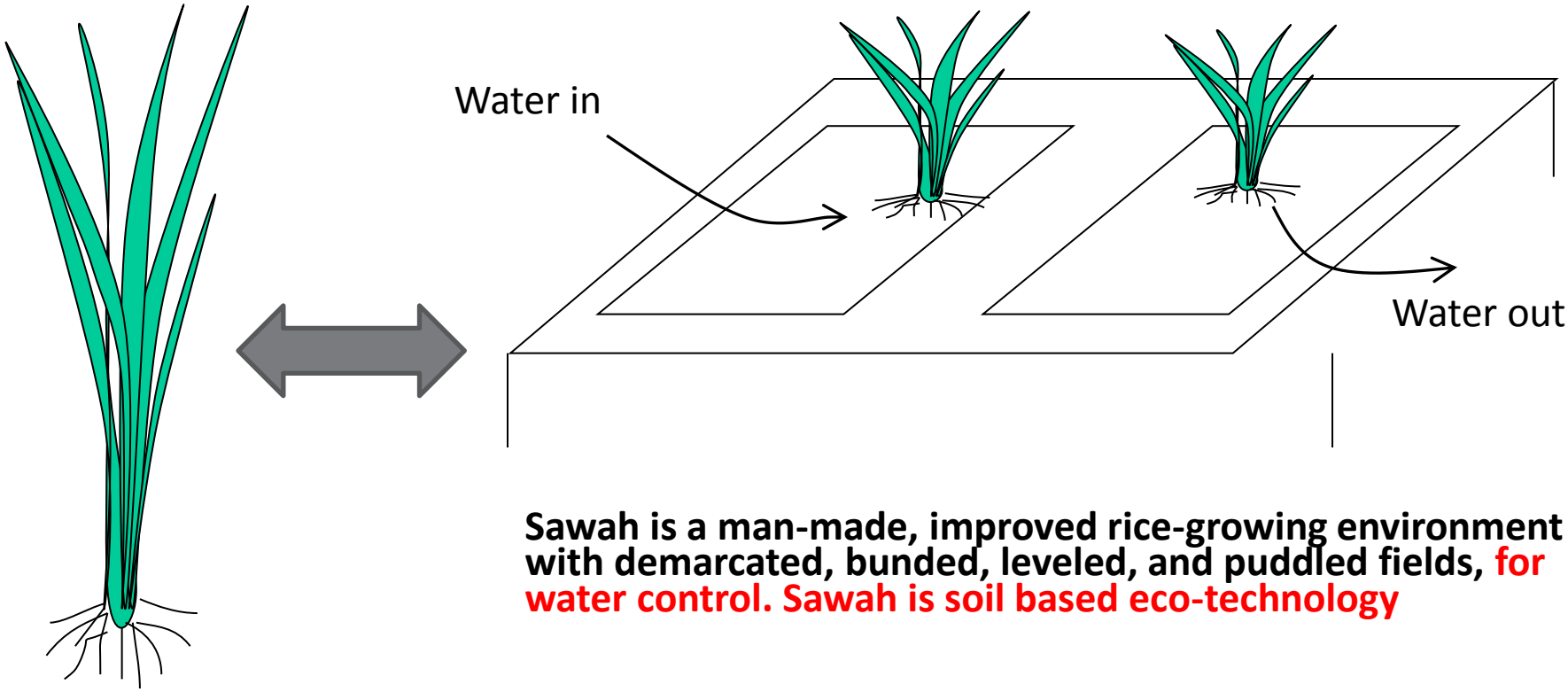
INTRO. CONT'D

To realize green revolution in Sub-Saharan Africa, it is essential to improve rice-growing environment by promoting lowland Sawah system. This is because the Sawah system utilizes the inland valleys which are reported to be high in fertility and through appropriate water management; fertility can be sustained and enhanced for rice production

Wakatsuki, 2008

WHAT IS “SAWAH” SAYING?

Rice variety **and** **Rice with improved environment**



Sawah is a man-made, improved rice-growing environment with demarcated, bunded, leveled, and puddled fields, for water control. Sawah is soil based eco-technology

Under intensification and for sustainability, there should be a balance between Biotechnology and Eco-technology

POTENTIAL OF SAWAH

The potential of Sawah based rice farming is enormous in West Africa 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 north-eastern Thailand, where there is one of the rice centres in the country.

Wakatsuki and Masunaga 2005

PROSPECTS FOR INCREASED RICE PRODUCTION IN NIGERIA

Great opportunities exist to increase rice production and strengthen both household and national food security in Nigeria.

Government is trying to increase local rice production to reduce rice imports. Simultaneously, the donor community has doubled its aid to SSA for reducing poverty and improving food security and nutrition. In such an environment, the vastly underexploited rice sector offers a tremendous opportunity to substantially increase local food production and improve food security and farmers' income and livelihood.

PROSPECTS

- ***Ecology:*** The potential area for rice production in Nigeria is between 4.6 and 4.9 million ha. This area includes five different rice ecologies, (Imolehin, 1991). The inland valley accounts for an estimated 25% of Nigeria's rice area with yield potential ranging from 2 to 8 tonnes/ha and contributing between 43 and 45 per cent of national rice production while the irrigated rice ecology is the most recently developed rice environment accounting for about 18% of cultivated rice land and contributing 10-12 per cent of the national rice supply, (Singh et al, 1997). These ecologies can be fully developed to meet the national rice demand.

Table 1 Distribution of lowlands and potential irrigated sawah in SSA (Hekstra, Andriesse, Windmeijer 1983 & 1993, Potential Sawah area estimate by Wakatsuki 2002)

Classification	Area (million ha)	Area for potential sawah development	
Coastal swamps	17	4-9	millon ha (25-50%)
Inland basins	108	1-5	million ha (1-5%)
Flood plains	30	8-15	million ha(25-50%)
Inland valleys	85	9-20	million ha(10-25%)

Although priority target is the inland valley because of easier w… control, some flood plains can be high priority,such as … & Kebbi where personal pump irrigated sawah is efficient

…ximum sawah area : 20million ha **(Estimated sawah area came from the re… amount of water cycle in Monsoon Asia, which has 130 million ha sawah)**

SAWAH AND LOWLAND UTILIZATION

The Sawah system of rice production which ensures proper management of the rice environment leading to efficient and higher rice grains production with higher returns is a better option to current systems. It is one of the most efficient systems that will ensure adequate production to meet the ever increasing demand and save the country from the use of scarce foreign exchange resources for its importation

SAWAH HYPOTHESIS(II): SUSTAINABLE PRODUCTIVITY OF LOWLAND SAWAH IS MORE THAN 10 TIMES THAN UPLAND FIELD (COMPARING UPLAND AND LOWLAND ECOLOGY)

1ha sawah is equivalent to 10-15ha of upland

	Upland		Lowland(Sawah)
Area (%)	95 %		5 %
Productivity (t/ha)	1-3 1 ≦ **		3-6 2**
Required area for sustainable1 ha cropping*	5 ha	:	1 ha

* Assuming 2 years cultivation and 8 years fallow in ...inable upland cultivation, while no fallow in sawah
...se of No fertilization

SAWAH POTENTIAL IN LOWLAND ECOLOGY

If the 4.6 Million Ha of the Lowland Ecology is fully developed by Sawah Eco-technology with Minimum yield of 4tonnes/ha, there will be an annual paddy production of 18.4 Million Tons and about 12.144 million ton of milled rice.

At the current consumption rate of 5 Million tonnes of milled rice, there will be more than half of the production for export and industrial raw materials.

Mean grain yield of 23 rice cultivars in low land ecologies at low (LIL) and high input levels (HIL), Ashanti, Ghana (Ofori & Wakatsuki,2005) 2005)

BIOTECHNOLOGICAL IMPROVEMENT

← ECOTECHNOLOGICAL YIELD IMPROVEMENT

	Entry No.	Cultivar	Irrigated Sawah		Rainfed sawah		Upland like fields	
			HIL	LIL	HIL	LIL	HIL	LIL
			(t/ha)		(t/ha)		(t/ha)	
	1	WAB	4.6	2.9	2.8	1.6	2.1	0.6
	2	EMOK	4.0	2.8	2.9	1.3	1.4	0.5
	3	PSBRC34	7.7	3.5	3.0	2.1	2.0	0.4
	4	PSBRC54	8.0	3.7	3.8	2.1	1.7	0.4
	5	PSBRC66	5.7	3.3	3.8	2.0	1.8	0.4
	6	BOAK189	7.0	3.8	3.7	2.0	1.4	0.3
	7	WITA 8	7.8	4.2	4.4	2.1	1.8	0.5
	8	Tox3108	7.1	4.1	4.0	2.3	2.3	0.6
	9	IR5558	7.9	4.0	3.8	2.0	1.8	0.5
	10	IR58088	7.7	4.0	3.7	1.8	1.4	0.3
	11	IR54742	7.7	4.3	4.0	2.2	1.9	0.4
	12	C123CU	6.9	4.1	4.2	1.9	2.0	0.4
	13	CT9737	6.5	4.0	4.0	1.7	1.9	0.6
	14	CT8003	7.3	3.8	3.8	1.7	2.0	0.5
	15	CT9737-P	8.2	4.0	4.3	1.8	1.2	0.5
	16	WITA1	7.6	3.6	3.3	1.8	0.9	0.3
	17	WITA3	7.6	3.5	4.1	2.0	1.3	0.5
	18	WITA4	8.0	4.1	3.7	2.1	1.5	0.3
	19	WITA6	8.0	3.5	4.0	2.3	1.4	0.3
	20	WITA7	7.3	3.7	3.8	2.2	2.0	0.4
	21	WITA9	7.6	4.4	4.5	2.8	2.0	0.6
	22	WITA12	7.6	4.0	3.8	1.9	1.8	0.4
	23	GK88	7.5	3.8	3.5	2.0	1.8	0.5
		Mean (n=23)	7.2	3.8	3.8	2.0	1.7	0.4
		Range	(4.0-8.2)	(2.8-4.4)	(2.8-4.5)	(1.3-2.8)	(0.9-2.3)	(0.3-0.6)
		SD	1.51	0.81	0.81	0.45	0.44	0.12

Because of cost of green revolution technology, yield must be higher than 4t/ha

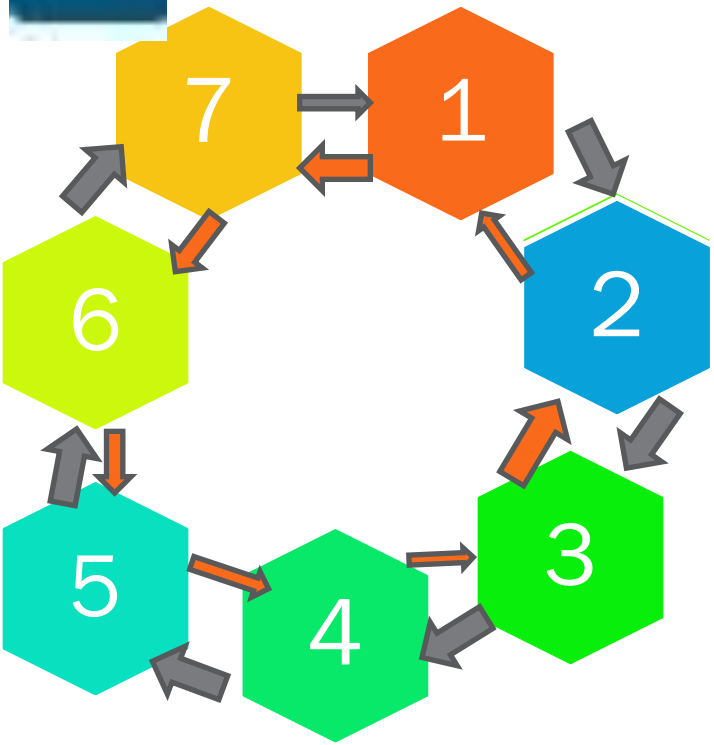
CHALLENGES

- The production of locally preferred rice at a competitive price is the biggest challenge to Nigerian farmers.
- The second challenge lies in identifying, branding, and promoting high quality locally adapted rice varieties and eco-technology in national, regional, and international markets.
- Absence of a coherent and comprehensive policy, plan, and program to tackle the many constraints and deficiencies of the national rice sector in African countries.
- Poor Researcher-Extension Workers-Farmers Linkages

SOLUTION TO THE CHALLENGES

- Marketable paddy Production by Sawah Eco-technology is the Key .
- We believe that to address these challenges, it is critical to improve the weak rice R&D capacity in Nigeria.
- The development of high - yielding rice varieties and profitable production technologies (such as sawah) is a prerequisite to trigger changes in supporting policies, such as investments in irrigation, initiation of credit programs, revamping of national rice R&D systems, and development of rural infrastructure and market systems for local rice.
- Active extension services are keys in passing developed technologies on to rice farmers who are the end users. In these regard, new agricultural technologies, such as the sawah eco-technology developed by Japan along with other management practices should be disseminated effectively and rapidly by extension systems so that they can be adopted by farmers.

INCREASING COLLABORATION BETWEEN RESEARCHERS-EXTENSION WORKERS-FARMERS



1.Problems Identification

2.Technology, Instituions, and disseminationsneeds

3.Participatory programs formulation

4.Assessment and dissemination planning

5.Assessment and dissemination execution

6.Evaluation on technology, institution, and dissemination methods performance

7.Upscalling

Communication processes of researchers, extension workers and farmers

Utilizing outputs for program input

Feedback

RECOMMENDATIONS

1. There is increased and improved nutrient utilization under the “sawah” system with minimum environmental effects (eco-friendly).

2. The “sawah” technology has shown to be more productive (yields, income generation, employment, food security).

3. To make a national/international impact, the “sawah” technology should be introduced to farmers of all rice-growing areas (scaling out). This could be through policy, legislation or otherwise.

4. Excellent collaboration work has to be done by both national and international organizations.

ACKNOWLEDGEMENT

We Appreciate Prof. Wakatsuki of Kinki University and Emeritus Professor of Shimane University, Japan for devoting his time to sustain the Project for a long time, MAFF, MEXT of Japan, the Executive Director and Management of NCAM, Ilorin for their unflinching support, the Sawah Team for their cooperation and the GREAT Nigeria Farmers for their readiness to adopt the already PROVEN technology,SAWAH.


Gratias!
Thank You!
Arigato
Merci!