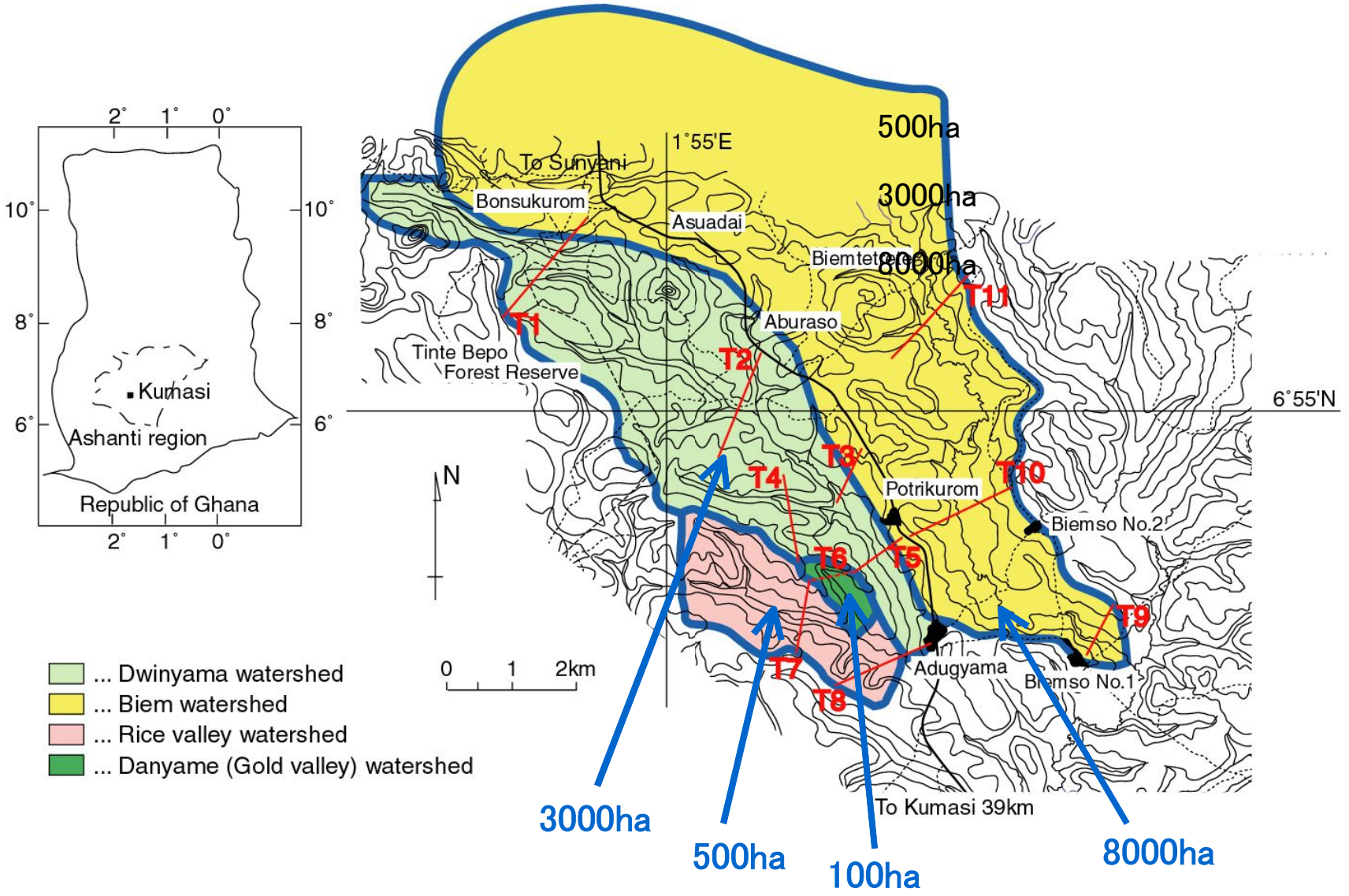
THE "SAWAH" TECHNOLOGY OF RICE PRODUCTION FOR THE LOWLAND: AN EFFECTIVE TOOL FOR POVERTY ALLEVIATION IN SOUTHERN GHANA

Buri. M. M*., Issaka R. N* & Wakatsuki T.**

***CSIR – Soil Research Institute, Ghana**

**** Faculty of Agric. Kinki Univ., Japan**


2° 1° 0°
10°
8°
6°
Kumasi
Ashanti region
Republic of Ghana
1°55'E
6°55'N
To Sunyani
Bonsukurom
Asuadai
Biemtetenso
Aburaso
Tinte Bepo
Forest Reserve
Potrikurom
Biemso No.2
Biemso No.1
Adugyama
To Kumasi 39km
N
0 1 2km
500ha
3000ha
8000ha
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
... Dwinyama watershed
... Biem watershed
... Rice valley watershed
... Danyame (Gold valley) watershed
3000ha
500ha
100ha
8000ha

COMMERCEMENT

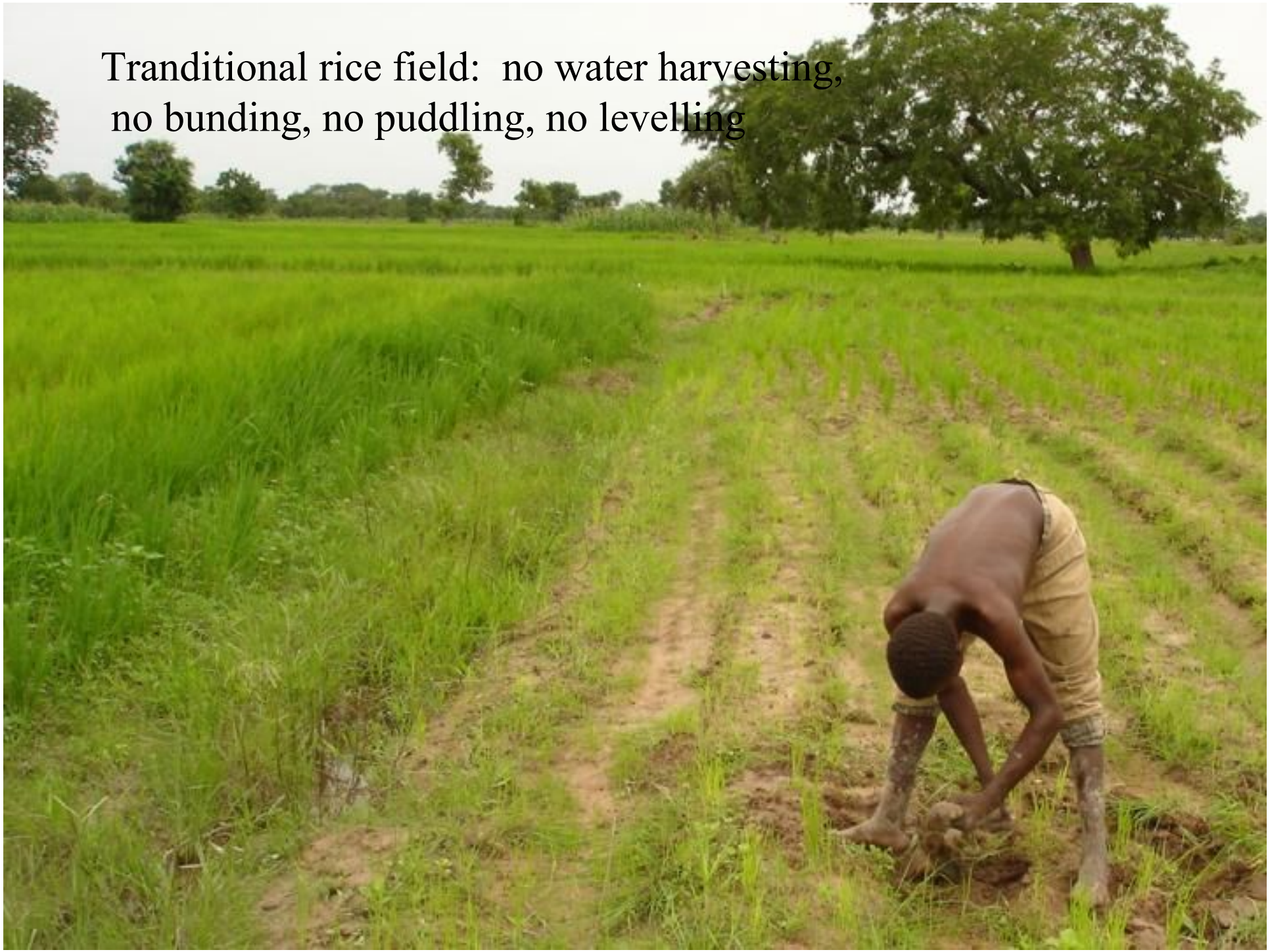
Work carried out between 2001 and 2005 in the Ahafo South District of the Ashanti region, Ghana after the introduction of the "Sawah" technology (a joint CSIR/JICA effort)

Area statistics

- Semi-deciduous agro-ecological zone
- Bi-modal rainfall pattern
- Annual rainfall of 800 -1000 mm
- Main season: April – August
- Minor Season: September - December

OBJECTIVES

Assess the usefulness and impact of the “sawah” technology on rice production within the Ahafo Ano South district of Ashanti.


Tranditional rice field: no water harvesting,
no bunding, no puddling, no levelling

WHAT IS "SAWAH"

The term "sawah" simply mean paddy. It refers to the creation of an environment that effectively and efficiently harvest and controls water for rice cultivation by

(a) bunding,

(b) puddling and

(c) levelling

It uses mostly local materials for water harvesting

MAJOR ACTIVITIES UNDERTAKEN

1. Technology transfer (farmer organization and on-the-job training)

2. Monitoring of paddy yields of farmer-groups

3. Monitoring of soil fertility levels through soil sampling of farmers fields

4. Estimation of revenue (information provided by farmers

On-the-job training

Farmers, who participated fully in all operations, were taken through the following:

- Group formation and site selection
- Water management (harvesting & utilisation)
- Land preparation (ploughing, pudlling, levelling)
- General rice agronomy and harvesting

Farmer organization

Soil and Wooden Weir, because of farmers' self-support and management


Canal construction by participating farmers

Bunding in Sawah construction can be done by participating farmers' (self-support efforts)

Land Preparation

Power tiller ploughing

Power tiller operated leveling needs some concerted works,

Manual Leveling


Power-tiller operated leveling looks appropriate,

General Agronomy

Mean grain yield for "Sawah" adopted farmer- groups

	Paddy Grain Yield (t/ha)				
Farmer-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 1 - A	4.8	4.7	4.8	5.5	-
Biemso 1 - B	4.7	5.7	5.9	6.5	5.4
Biemso 1 - C	-	4.5	5.4	5.5	5.5
"Sawah" mean	4.5	4.9	5.1	5.6	5.1
Traditional "	0.9	1.0	1.0	1.1	1.1

* Fields partially destroyed by floods

Soil nutrient levels (0-30cm) changes under "sawah" from 2001 - 2005

Parameter / Site		Adugyama A	Adugyama B	Biemso A	Biemso B	Biemso C	Mean
Total C ($g\ kg^{-1}$)	Initial level	13.7	13.2	11.8	8.1	11.1	
	% change	3.2	2.95	3.2	4.1	2.8	+ 3.2
Total N ($g\ kg^{-1}$)	Initial level	1.30	1.30	1.20	1.10	1.40	
	% change	-3.1	0.77	-5.8	-5.4	-4.3	- 3.6
Av. P ($mg\ kg^{-1}$)	Initial level	3.3	3.8	4.5	4.7	3.1	
	% change	15	-83	-30	-84	-62	- 49
Ex. K ($Cmol\ kg^{-1}$)	Initial level	0.10	0.16	0.05	0.06	0.03	
	% change	38	29	16	31	100	+ 43
Ex. Ca ($Cmol\ kg^{-1}$)	Initial level	8.8	7.3	2.9	3.2	3.8	
	% change	45	39	14	10	22	+ 26
Ex.Mg ($Cmol\ kg^{-1}$)	Initial level	2.2	1.7	0.9	1.4	1.2	
	% change	6	3	12	7	7	+ 7
Ex. Na ($Cmol\ kg^{-1}$)	Initial level	0.06	0.26	0.25	0.25	0.77	
	% change	40	18	41	36	7	+ 28

Estimated revenue of farmer groups per hector

Farmer-group	Paddy yield (kg)	Gross Revenue (US$)	Production Cost (US$)	Net Revenue (US$)
Adugyama	4334	1712	428	**1284**
Biemso 1 - A	4675	1847	350	**1497**
Biemso 1- B	4736	1871	324	**1547**
Biemso 1 - C	4675	1847	349	**1498**

Source – Information provided by each farmer-group.

Cost of power tiller hiring excluded because project provided power tiller

Conclusions

1. The “sawah” technology has brought marked improvement in rice yields

2. Quite intrinsic and environmentally friendly to our fragile ecosystems

3. The technology has brought increased income to farmers

4. Technology is one way of creating rural employment and reducing rural poverty.

5. In the light of employment creation, the system can also help to reduce rural – urban migration

ACKNOWLEDGEMENT

We are most grateful to the Kinki and Shimane Universities, both in Japan for providing financial and material support, during the conduction of the study