Farmers’ personal irrigated Sawah systems to realize green revolution and Africa’s rice potential

Wakatsuki, Buri, Bam, Oladele and Admiluyi

SMART IV kickoff workshop from 16-17th August 2010, Africa Rice, Cotonou

African farmers can develop their personal irrigated sawah systems by themselves to realize green revolution and Africa’s rice potential.
Agricultural trials using both Indigenous & Exotic trees

**Development Business:**
UN Millennium Villages / World Bank / AfD Bank / JICA / NGOs

**Main Goal:**
Sustainable production of 100 million tons of paddy through 20 million ha of lowland Sawah development.
The restoration of 100 million ha of forest to combat Global Warming

**Action Research on Materialization of Green Revolution by Sawah Eco-technology and the Creation of Africa SATOYAMA watershed model to combat the global warming (MEXT assisted scientific research project, 2007-2011)**

**Practices of Eco-technology development of various sustainable Sawah system options in 50-100ha in Ghana and Nigeria**

**New land systems for enhance sustainable Sawah development in present diverse landuse systems under diverse socio-economy and history**

**Nutrient cycling**
- Rainfall
- Rock weathering, soil formation, nutrient release
- Topsoil erosion & sedimentation
- Geographical fertilization
- Nutrient rich water
- Discharge
- Irrigation canal
- Fish pond
- Supply of nutrients by animals

**Sawah hypothesis (I):**
The prerequisite of Green revolution is sawah fields which improve rice ecology

**Sawah hypothesis (II):**
Sustainable productivity 1ha Sawah equivalents 10-15ha upland fields

**Africa SATOYAMA**
- Watershed agroforestry
- Forest transition zone
- Major agroecosystems
- Sustainable self-support Sawah development & management
- The creation of Africa SATOYAMA model, Village based watershed development & management

**Exremely diverse lowland ecosystems**
- Ground water
- Suitable Sawah
- Upland-like Draught prone
- Suitable Sawah
- Flood prone

**Various Sawah system options suitable for diverse lowland ecosystems were carried out by participating farmers’ self-support efforts with trials and errors approach (Results of previous long-term action research)**

**Intensive upland farmings need integration with livestock raising**

**Watershed agroforestry**
- Development business: UN Millennium Villages / World Bank / AfD Bank / JICA / NGOs
- Main Goal: Sustainable production of 100 million tons of paddy through 20 million ha of lowland Sawah development.
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**IITA:**
- Farming systems
- Africa Rice (SMART - IV)
- JIRCAS

**IWM:**
- Hydrology

**Ghana:**
- SRI / CRI / FoRIG / WRRI
- Forest transition zone

**Nigeria:**
- NCAM / Fadma III

**Major agroecosystems**
- Various Sawah system options suitable for diverse lowland ecosystems were carried out by participating farmers’ self-support efforts with trials and errors approach (Results of previous long-term action research)

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Experiences and examination of Sawah hypothesis I & II through long term action researches in Ghana and Nigeria

Benchmark site at Nigeria, Guinean Savanna zone, near Bida city. Emikpata river watershed with 5,000 ha. Geology: Nupe sandstone, Cretaceous. 1986 - present

Benchmark site at Ghana, Forest traditional zone, near Kumasi. Biem river watershed with 7,000 ha. Geology: Gramite and Gneiss. Annual rainfall 1,500 mm. 1994 - present

Core benchmark sites with various sized watersheds in Ghana & Nigeria. The action research sites were expanded in 2008-2010.

AfricaRice, SMART-IV

IITA, International Institute of Tropical Agriculture, Ibadan, WIN office
CRI/SRI/WRI/FoRIG-CSIR/JICA Sawah project for Integrated watershed management, 1997-2001
Flood prone sites

Long last springs ideal for sawah

Drought prone

Shallow ground Water for pump irrigation

Weak rive flow Upland use problem?

Weak but steady flow

Steady water flow for ideal Weir & pump irrigation

Fish pond & irrigation

Land tenure & allotment

Republic of Ghana

Ashanti region

Kumasi

Dwinyama watershed

Biem watershed

Rice valley watershed

Danyame (Gold valley) watershed

To Sunya

Bonsukurom

Asuadai

Biemte

Aburasi

Tinte Bepo

Forest Reserve

Biemso No.1

To Kunase
Canal construction by participating farmers
Soil and Wooden Weir, because of farmers’ self-support management under no rocks available.
Photo. 3-23. Excavation of river bottom and jute bags

Photo. 3-25. Compaction to create impermeable layer on the front of dyke, March 2000

Photo. 3-26. Dyke was covered with sand bags after compaction of permeable layer

Photo. 3-17. Flooding over dyke
Sand bag weir by farmers and SRI Sawah team, Aug. 2009, Nsutem, Ghana
Partially intercepted irrigation canal at Gadabiu, FCT FadamaIII, 26 Sep 10

On the job training Sawah bunding

river
Sawah construction can be done by participated farmers’ self-support efforts
Sokwae Sawah development
by CRI sawah team, June 2008
Sokwae Sawah development by farmers July 2008
Manual Leveling needs hard-works for Sawah system construction