



## NSSP Workshop Report 20

### CONCEPT NOTE WORKSHOP ON IRRIGATION AND MECHANIZATION (Prepared by Grace Adeogun)

Nigeria Strategy Support Program  
Workshop Report

April 01, 2011

IFPRI-ABUJA  
International Food Policy Research Institute  
c/o International Center for Soil Fertility and  
Agriculture Development  
No.6/ Plot 1413 Ogbagi Street  
Off Oro-Ago Crescent  
Cadastral Zone 11, Garki, Abuja  
Nigeria  
E-mail: [ifpri-nigeria@cgiar.org](mailto:ifpri-nigeria@cgiar.org)  
[www.ifpri.org](http://www.ifpri.org)

IFPRI HEADQUARTERS  
International Food Policy Research  
Institute  
2033 K Street NW  
Washington, DC 20006-1002 USA  
Tel. +1-202-862-5600  
Fax +1-202-467-4439  
E-mail [ifpri@cgiar.org](mailto:ifpri@cgiar.org)  
[www.ifpri.org](http://www.ifpri.org)

## **THE NIGERIA STRATEGY SUPPORT PROGRAM WORKSHOP REPORTS**

### **ABOUT NSSP**

**The Nigeria Strategy Support Program (NSSP) of the International Food Policy Research Institute (IFPRI)** in collaboration with the Federal Ministry of Agriculture and Rural Development (FMARD) has an initiative to strengthen evidence-based policymaking in Nigeria in the areas of rural and agricultural development. This initiative, facilitated by USAID, supports the implementation of Nigeria's national development plans by strengthening agricultural-sector policies and strategies through:

- Enhanced knowledge, information, data, and tools for the analysis, design, and implementation of pro-poor, gender-sensitive, and environmentally sustainable agricultural and rural development policies and strategies in Nigeria;
- Strengthened capacity for government agencies, research institutions, and other stakeholders to carry out and use applied research that directly informs agricultural and rural policies and strategies; and
- Improved communication linkages and consultations between policymakers, policy analysts, and policy beneficiaries on agricultural and rural development policy issues.

### **ABOUT THESE WORKSHOP REPORTS**

The Nigeria Strategy Support Program (NSSP) Workshop Reports provide a record of the presentations delivered during workshops and key comments from the audience and group discussions. The comments from the participants do not necessarily reflect the views of IFPRI.

# CONCEPT NOTE WORKSHOP ON IRRIGATION AND MECHANIZATION<sup>1</sup>

Abuja, Nigeria  
April, 2011

---

<sup>1</sup> Copyright © 2011 International Food Policy Research Institute. All rights reserved. Sections of this material may be reproduced for personal and not-for-profit use without the express written permission of but with acknowledgment to IFPRI. To reproduce the material contained herein for profit or commercial use requires express written permission. To obtain permission, contact the Communications Division at [ifpri-copyright@cgiar.org](mailto:ifpri-copyright@cgiar.org).

## Table of Contents

Introduction.....	5
Opening Ceremony .....	5
Summary of Presentations .....	5
<i>Overview of the proposed research on Irrigation and Mechanization study</i> .....	5
<i>Farmers' personal irrigated sawah systems to realize the green revolution and Africa's rice potential</i>	6
Small Group Discussion (Mechanization) .....	6
Small Group Discussion (Irrigation).....	7
Appendix A: Invitation Letter.....	8
Appendix B: Workshop Agenda .....	9
Appendix C: Participants List.....	10

## **Introduction**

In line with the Federal Ministry of Agriculture and Rural Development's (FMARD's) vision of ensuring access, availability and affordability of high-quality food to all Nigerians, the International Food Policy Research Institute (IFPRI) is undertaking research on agricultural mechanization in Nigeria under the Feed the Future (FtF) initiative of the United States Agency for International Development (USAID). The FtF program expects to support the governments and technical agencies of some 20 "focus countries," including Bangladesh, Cambodia, Nepal and Nigeria in programs focused on:

1. Production technology: R&D to enhance the availability of high- and optimum-yielding germplasm (seeds, varieties, and breeds), improved production practices, pest control, and soil and water management;
2. irrigation and water-use improvement, such as rehabilitation and construction of new structures and wells;
3. post-harvest technology, including primary processing, handling, drying, and storage; and
4. agricultural extension (training and communication) on the above topics.

The workshop outlined the proposed research activities to be undertaken by IFPRI during 2011 through 2013 on the topic "Agricultural Irrigation and Mechanization in Nigeria." The main objectives included:

- Sharing information on the proposed actionable research on irrigation and mechanization; and
- Soliciting constructive criticism and inputs from participants

The workshop was attended by 47 participants consisting of the general public, government officials, agricultural economists, agricultural engineers, and research engineers from various universities and research institutes (Appendix 2). It was held at 3J's Hotel, Abuja on February 24, 2011.

## **Opening Ceremony**

The workshop was opened by the Program Leader of the NSSP, Dr. James Sackey. He welcomed participants to the concept note workshop and reiterated the importance of getting honest and constructive feedback from participants. He also expressed gratitude to all participants for making themselves available for the workshop, noting that IFPRI could not achieve its objective if they had not agreed to be part of the program. Mr. Howard Batson, the representative for USAID, also gave a welcome remark, noting his pleasure at being part of the workshop and that he was looking forward to all the interesting deliberations expected to take place. In his welcome address, Dr. Sunday Uhiene, representing the FMARD, highlighted the importance of the work being undertaken by the government in ensuring adequate food for all Nigerians in the nearest future. He also encouraged those present to participate actively, as achieving the goals of the workshop was highly dependent on their inputs.

## **Summary of Presentations**

Two presentations were made. The first was by Dr. Hiroyuki Takeshima of IFPRI on the "*Overview of the Proposed Research on the Irrigation and Mechanization Study.*" The second presentation was by Dr. Segun Ademiluyi of the National Centre for Mechanization, Ilorin on "*Farmers' personal irrigated sawah systems to realize the green revolution and Africa's rice potential*" (see Appendix D).

### *Overview of the proposed research on Irrigation and Mechanization study*

Dr. Takeshima gave a presentation describing the proposed research on private irrigation systems and on mechanization. He said that, while there are many aspects of irrigation technology for consideration – the environmental, hydrological, etc. - the proposed research is specifically interested in the social science aspects, such as farmers' demand for the technology and the choices they make. In particular, the aim is to look at the irrigation system as it reflects the diversity of irrigation practices among farmers, which is

an important aspect for a country like Nigeria with diverse agro-ecological/socio-economic conditions. He noted that the objective of the presentation was to solicit comments/suggestions on the proposed research, and especially on the research questions, survey methods, and background. Using graphs and maps, he described briefly the historical trend of irrigated areas in Nigeria, the geographical distribution of irrigation and the kind of crops that are the most irrigated in Nigeria. He further explained that comparison across irrigation systems is important from two perspectives. First, each irrigation system is expected to perform differently in terms of setup costs, profitability, and associated crop yield. Second, whenever farmers adopt irrigation technology, they are making choices on water sources, application methods, and irrigation seasons. Their decision-making must reflect specific constraints they face, and it is important to understand these constraints and how they affect decisions. In this respect, he cautioned that it is important that the survey instrument be nationally representative. He concluded by outlining the key questions on irrigation which were to be the subject for the small-group discussions.

On mechanization, Dr. Takeshima gave a brief background on the status of research on agricultural mechanization in Nigeria. He presented graphs portraying the share of land cultivated in developing countries by hand tools, draft animals and tractors. Dr. Takeshima stated that the pace of mechanization is slow in sub-Saharan Africa and reviewed the key issues facing agricultural mechanization in Nigeria. The proposed research will focus on the linkages between farming systems and farmers' demand for various power sources and tools. The research will also examine the role of less-sophisticated tools, such as improved hand tools or intermediate tools, as opposed to more-sophisticated tools like tractors. Finally, Dr. Takeshima highlighted the key research questions for group discussion.

### *Farmers' personal irrigated sawah systems to realize the green revolution and Africa's rice potential*

Dr. Ademiluyi talked about *sawah* systems in his presentation. The *sawah* system is a combination of both irrigation and mechanization technologies for rice production. Dr. Ademiluyi said that, of the approximately 250 million ha of lowlands in Sub-Saharan Africa, only about 10 percent is considered appropriate for the development of *sawah* systems because of hydrological, topographical, and pedological limitations. Of all lowland types, inland valley is the priority because of the relative ease of water control. *Sawah* systems offer low-cost irrigation and water control for intensification of rice production, with sustainable paddy yields of 4-6 tons/ha. If farmers combine improved agronomic practices, such as System Rice Intensification (SRI), with *sawah* systems, paddy yield can be higher than 10tons/ha. Careful site-specific *sawah* development and management technologies have to be researched, developed and disseminated throughout Africa. For local farmers to develop and manage *sawah* systems, self-propelled efforts and small-scale equipment such as hydropower tillers are needed. After plenty of trial-and-error, the *sawah* system was successfully tested from 1997 to 2009 in Ghana and Nigeria. Since rice farmers have to master a relatively wide range of skills to operate these systems, intensive on-the-job training is very important. As was seen in Ashanti (Ghana) and Bida, Abakaliliki, Akure, Zaria, Adani and Ilorin (Nigeria), once the necessary skills are mastered, they can be transferred between farmers to achieve a scale-up of success and realization of Africa's rice revolution.

### **Small Group Discussion (Mechanization)**

The following research questions were discussed:

Question 1: Where is Nigeria in terms of the evolution of farming systems (slide 9)?

Question 2: Does the use of tools in slide 9 (for different farming system) apply to Nigeria?

Question 3: Slide 11 says that 1) power-intensive activity is mechanized first, and control-intensive activity is mechanized second; and 2) stationary activity is mechanized first, and motive activity is mechanized second. Does this apply to Nigeria?

Question 4: Are hand tools and draft animals complements or substitute to tractors? Will farmers' adoption of hand tools speed up or slow down the adoptions of tractors?

### **Small Group Discussion (Irrigation)**

The following research questions were discussed:

Question 1: Are the irrigation systems presented representative of Nigeria? Are there any key components other than water source, water application methods, and seasonality?

Question 2: Different irrigation systems are expected to have different implications on the return from labor, land, water. Do slides 10-12 apply to Nigeria?

Question 3: Potential factors affecting choice/locations of irrigation system (slides 18 -20) => are they reasonable?

Question 4: Sampling focus (Slides 22 and 23) – are they reasonable?

## **Appendix A: Invitation Letter**

### **Invitation to the Nigeria Strategy Support Program (NSSP) Concept Paper Workshop on Irrigation and Mechanization; February 24, 2011**

The International Food Policy Research Institute (IFPRI) in collaboration with the Federal Ministry of Agriculture and Rural Development (FMARD) continues to work towards strengthening evidence based policymaking, generating policy research to fill key knowledge gaps and improving national capacity for policy analysis in Nigeria.

As part of activities under IFPRI's *Feed-the-Future(FtF)* initiative supported by USAID, we are pleased to invite you to a Concept Paper Workshop on **Thursday 24th, February 2010** at **the Red Rose Seminar Room of 3J's Hotel, No 31, P.O.W. Mafemi Crescent, Near National Health Insurance Scheme, Utako, Abuja.**

The main Objectives of the forum are to:

- Share Information on our proposed actionable research on irrigation and mechanization
- Get constructive criticism and input from participants on the proposed research

IFPRI will cover your participation at the workshop. Please find attached the document detailing all logistics arrangement including accommodation, travel reimbursements etc.

We look forward to your active participation at the workshop. Please note that the workshop starts at **9am** prompt.

To confirm participation, please contact Grace Adeogun {[G.Adeogun@cgiar.org](mailto:G.Adeogun@cgiar.org)} with a cc to Sheu Salau {[s.salau@cgiar.org](mailto:s.salau@cgiar.org)} or call 08033078613.

Yours truly,

A handwritten signature in blue ink, appearing to read 'J. Sackey', with a long horizontal line extending to the right.

Dr James Sackey  
Program Leader, IFPRI- Abuja



## **Appendix B: Workshop Agenda**

- 8:30- 9:00      **Registration of Participants**
- 9:00- 9:30      **Welcome Remarks**  
*James Sackey, Program Leader, International Food Policy Research Institute*  
*Permanent Secretary, FMWRD*  
*USAID Mission*
- 9:30- 10:30     **Overview of the proposed research on Irrigation and Mechanization study**  
*Dr. Hiroyuki Takeshima, Postdoctoral Fellow, International Food Policy Research Institute*
- 10:30- 11:00    **Irrigation and Mechanization Policies in Nigeria**  
Irrigation: *Director Irrigation and Drainage, FMWR Abuja*  
Mechanization: *Dr. Segun Ademiluyi National Centre for Mechanization, Ilorin*
- 11:00- 11:45    Discussions
- 11:45-12:00    Tea Break
- 12:00-12:45    **First Small Group Discussions: Mechanization**  
Group 1 Leader: *Professor Joseph G. Akpoko*  
Group 2 Leader: *Dr. Alpha Kamara*
- 12:45-1:15     Plenary: Reporting, Questions, Answers and Observations
- 1:15- 2:00      Lunch
- 2:00- 2:45      **Second Small Group Discussion: Irrigation**  
Group 1 Leader: *Prof. I.M. Abubakar*  
Group 2 Leader: *Dr. A. Adeoti*
- 2:45- 3:15     Plenary: Reporting, Questions, Answers and Observations
- 3:15- 3:20      **Vote of Thanks**  
*Grace Adeogun, International Food Policy Research Institute*

## Appendix C: Participants List

List of Participants for Concept Note Workshop on Irrigation & Mechanization			
SN	Name	Institution	Department
1	Adetola Adeoti	University of Ibadan	Dept of Agric econs
2	D.O Ohajianya	Federal University. Of Tech. Owerri	Dept of Agric econs
3	M.O. Akinola	Ahmadu Bello University. Zaria	Dept of Agric econs & Rural Sociology
4	Tahirou Abdoulaye	IITA-Ibadan	
5	Gabriel Umoh	University of Uyo	Dept of Agric Econs & Ext.
6	I. Mohammed	Abubakar Tafawa Balewa University. Bauchi	Dept of Agric Econs & Ext.
7	I.U. Abubakar	Ahmadu Bello University. Zaria	Dept of Agric Research
8	Ayorinde Olufayo	Federal University of Tech. Akure	Dept of Agric Engineering
9	Omotesho A.O	University of Ilorin	Dept of Agric & Farm Mgt
10	Aminu Abba	Bayero University. Kano	Dept of Agric Econs & Ext.
11	Durowoju M.O.	LAUTECH. Ogbomoso	Mechanical Engineering
12	Raufu Oyedapo	LAUTECH. Ogbomoso	Dept of Agric econs
13	Onoja Ojonimi	University of Portharcourt	Dept of Agric Econs & Ext.
14	Adesope Olufemi	University of Portharcourt	Dept of Agric Econs & Ext.
15	J.G. Akpoko	Ahmadu Bello University. Zaria	Dept of Agric econs
16	Johnson Onyibe	NAERLS	
17	Babagana Umara	University of Maiduguri	Dept of Agric & environ. engr
18	Samuel Sule	Federal Polytechnic. Bauchi	Dept of Agric Engineering
19	Ojediran Jeremiah	LAUTECH. Ogbomoso	Dept of Agric Engineering
20	Adebiyi Adekunle	LAUTECH. Ogbomoso	Dept. of Mechanical Engr
21	Jekayinfa Simeon	LAUTECH. Ogbomoso	Dept of Agric Engineering
22	Alpha Kamara	IITA	Research
23	Fasina Abayomi	University of Ado-Ekiti	Crop, Soil & Environ. Sciences
24	Yakubu Abdullahi	Usman Danfodio University. Sokoto	Dept of Agric Econs & Ext.
25	Taiwo Olalekan	University of Ibadan	Geography

<b>SN</b>	<b>Name</b>	<b>Institution</b>	<b>Department</b>
26	Odoemenem I.U.	University of Agric. Makurdi	Dept of Agric econs
27	Oliver Ujah	AIAE	Research
28	Hadiza Tukur	Sokoto Rima River Basin Authority	Planning
29	Abba Abdullah	Aquagric Ltd.	
30	Howard Batson	USAID	
31	S.C. Okoli	NFRA/FMARD	
32	N.Y. Longmut	FMARD	PPAS
33	Gbenga Adebowale	ENPLAN Group	Engineering
34	A.S. Olomola	NISER	
35	Sunday Uhiene	FMARD	PPAS/CAADP
36	Ademiluyi Segun	NCAM	Research Engineering
37	Faleye Tope	NCAM	Research Engineering
38	T. Wakatsuki	Kinky University. Japan	Faculty of Agric
39	Lizzy Igbine	Nigerian Women Farmers Association	
40	Yemi Agunbiade	Yemag Group	
41	Hiro Takeshima	IFPRI	
42	Sheu Salau	IFPRI	
43	James Sackey	IFPRI	
44	Grace Adeogun	IFPRI	
45	Charles Gamde	IFPRI	
46	Linus Ibezutu	Potato Farmers Association of Nigeria	
47	J.O. Olaoye	University of Ilorin	Dept. of agric & bio systems