Agricultural Technology Dissemination System and ODA Strategy in Africa

: A Case Study from Ethiopia and Uganda

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Outline

Ⅰ. Introduction

Research Purpose

- To improve the effectiveness of Korea's ODA projects on agricultural technology in African countries
  - This study investigates agricultural technology dissemination system of African countries.
  - This study provides a direction of strategies for the Korean ODA on agricultural technology transfer to Africa.

Questions

- How is current agricultural technology dissemination system in African countries, and How should ODA reflect it?
  - How does agricultural development have an impact on economic and social development of African countries?
  - How does improved agricultural technologies contribute to the agricultural development in Africa?
  - Do ODA projects perceive the necessity for improving the agricultural technologies?

Setting

- Aid Effectiveness & Development Effectiveness of ODA to African Countries
  - About 34% of ODA funds is allocated to Africa.
  - However, social and economic changes in Africa have not come up to ODA´s expectations.

- Why? → Supply-oriented (Donor-oriented) ODA trend
  - Deficiency in considering regional peculiarities and demands of the recipient countries in Africa.

- Distinct Characteristics of African Agriculture → Diversity & Complexity
  - More than 80% of the agricultural population → a small farmer group
  - Various farming culture based on diverse climate conditions and history by region/country or ethnic group

- No Hope from Monolithic Application of Technology and Disregarding Diversity of Seeds/Crops in Agricultural ODA to Africa
  → Barriers to the Agricultural Development in Africa

- Then, What? → Reflecting the diversity and the complexity inherent in African agriculture
  - Analyzing appropriate technology suitable for agricultural environment in the indigenous environment
  - Need to understand agricultural technology dissemination system of the recipient countries to transfer the technology efficiently
- In particular, the accurate delivery of the technology determines whether the technologies developed in the laboratory can be utilized in the field and lead to increasing agricultural productivity.

- However,
  - Lack of understanding on localized agriculture
  - Exposed problems such as the imbalance of functions and the inadequacy of system configuration

II. Theoretical Background

Characteristics of African Agriculture

Lack of Agricultural Input

- 55% of the whole African land is unsuitable for farming.
- More than 95% of all agricultural land is dependent upon non-artificial precipitation.
- Fertilizer input per 1ha is about 10kg, comparing with the average of developing countries, 120kg.
- Primitive ways of agriculture is prevalent, such as slash-and-burn agriculture.
- Advanced agricultural machinery is used very limitedly.

Small-scale Farming

- More than 85% of the agricultural labor force is a small farmer who cultivate 2ha or less farm land.
- The polarization of agricultural structure has deepened income disparity between plantations from foreign capital and indigenous peasants.
- The low purchasing power of rural households impede the market formation.

Deficiency in Governmental Role

- Farmland has been devastated by the border, religious, inter-ethnic conflicts.
- Agricultural sector has been neglected due to the political instability.
- Governments fail to manage economic difficulty and lack public services.
- Corruption is prevalent among some of the bureaucratic organizations.

Agricultural technology transfer & ODA Situation

- Development level of agriculture is still low compared to foreign investment to African agriculture.
  - In terms of total ODA budget, the proportion of aid to agriculture, forestry and fisheries has been increased.
  - Total amount of ODA to be invested in Africa is also being increased continuously.
  - However, the growth of agricultural productivity in Africa has been stagnant since the 1960s, while the agricultural productivity in Asian developing countries has been improved dramatically.

<Table > ODA to Agricultural Sector, OECD-DAC

Unit: USD million, (%)

Sector		2005	2006	2007	2008	2009	2010	2011
Agriculture, Forestry, Fishing	Amount	4,567	4,669	6,714	7,429	9,357	9,806	10,584
	Ratio	(3.73)	(3.62)	(5.04)	(4.68)	(6.05)	(5.90)	(6.34)
Total ODA	Amount	122,460	129,044	133,201	158,586	154,617	166,246	167,005
	Ratio	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: The values are based on current price at that time.

Source: OECD (http://stats.oecd.org)

- With lots of concerns on its effectiveness, ODA on agricultural technology transfer to Africa has appeared as a good alternative to reduce the poverty.
  - An efficient ODA is possible to obtain promising results even in relatively small-scale aid.
  - The effects can be expected to increase crop yields, manage pest control, and reduce poverty rate.
  - Ultimately, it enables recipients countries to ensure the foundation of economic development and achieve humanitarian objectives of ODA.

Identifying & Restructuring Agricultural Technology Dissemination System

Diversity of the System

- The system is different from each other, based on the circumstances of agricultural environment, farming culture, political system, etc.
  - This study focuses particularly on the system by function and organization, considering the distinct characteristics of each country.

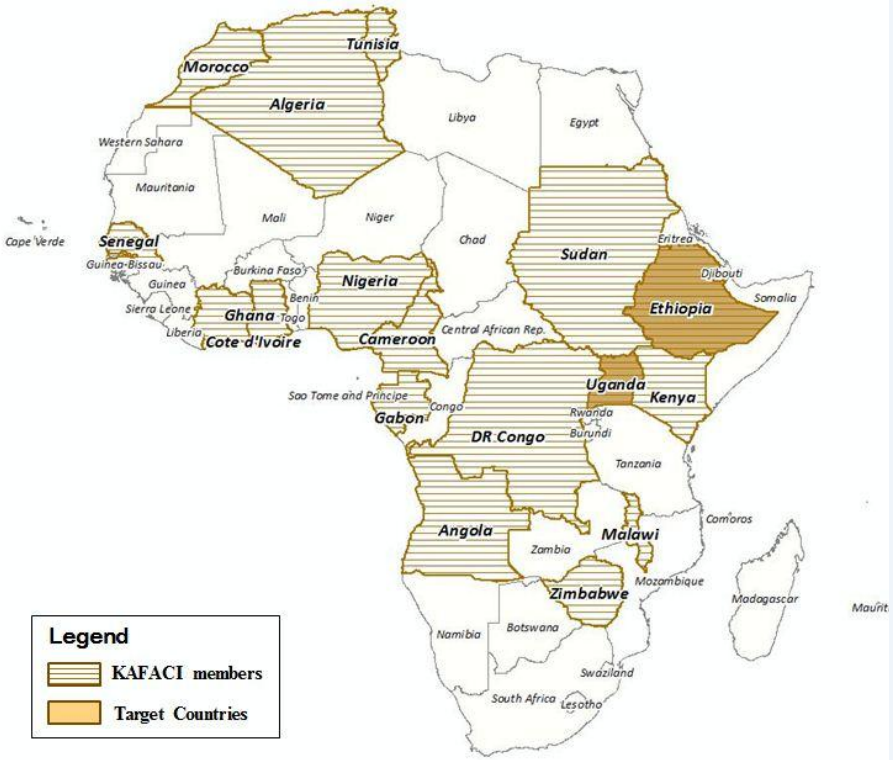
Investigation into the Diversity

- Providing a diagnosis and development of delivery system is required based on the characteristics of the recipients.
  - It might produce side effects since many ODA projects set up a particular framework for agricultural extension and apply it uniformly to all the countries in Africa.

- This study tries to identify the macroscopic characteristics of the agricultural extension system, by reflecting both qualitative and quantitative aspects of African experiences circumnavigating literature review and analysis of diverse descriptive statistics available.
  - Existing research methods, such as survey or technology acceptance model, only focuses on micro- and hardware-characteristics.
  - It reveals the limitations that overlook the macro-scale properties and only explain physical aspects of the technology delivery.

Ⅲ. Methodology and Data

Data & Scope

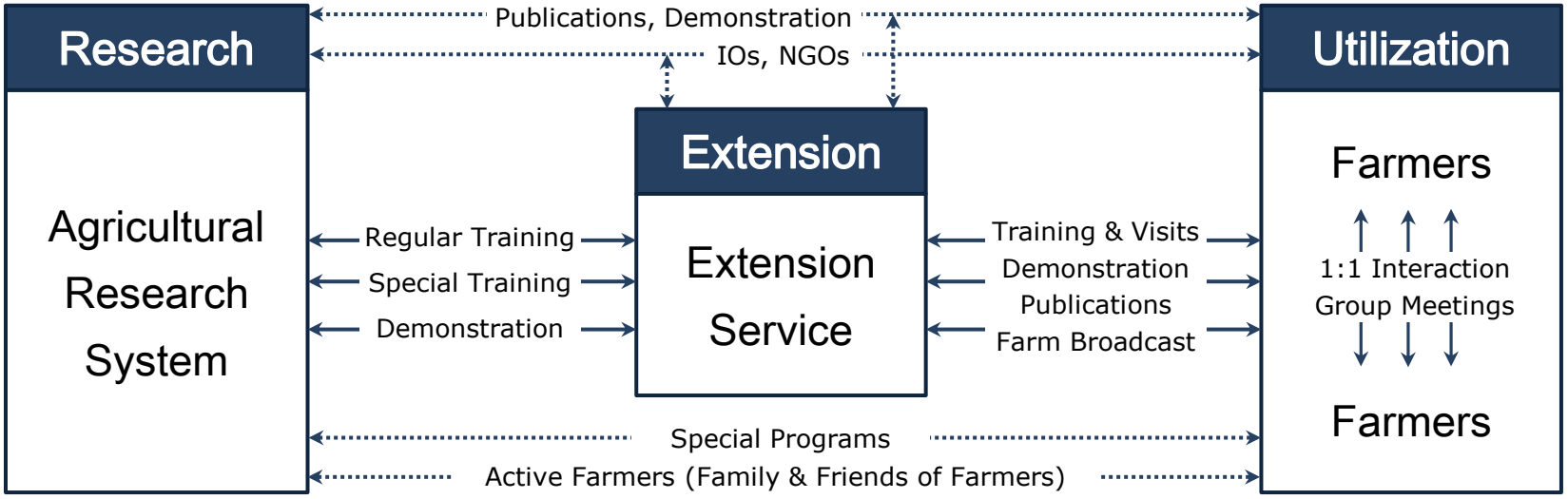


<Figure > Spatial Scope of the Analysis

- The Scope of the Study is as follows;
  - To understand the agricultural technology dissemination system of Africa, focusing on case studies from ***Ethiopia & Uganda***
  - Spatial Scope of the Analysis:
    - Ethiopia & Uganda among 17 KAFACI member countries
    - And, why?
  - Time Horizon of Statistics: 2008
  - Source:
    - ASTI (Agricultural Science & Technology Indicators)
    - ADI (African Development Index)
    - World Bank (http://data.worldbank.org/)
    - Uganda Census of Agriculture 2008/2009
    - MAAIF(Uganda) Statistical Abstract 2011

Framework for Analysis: Functions

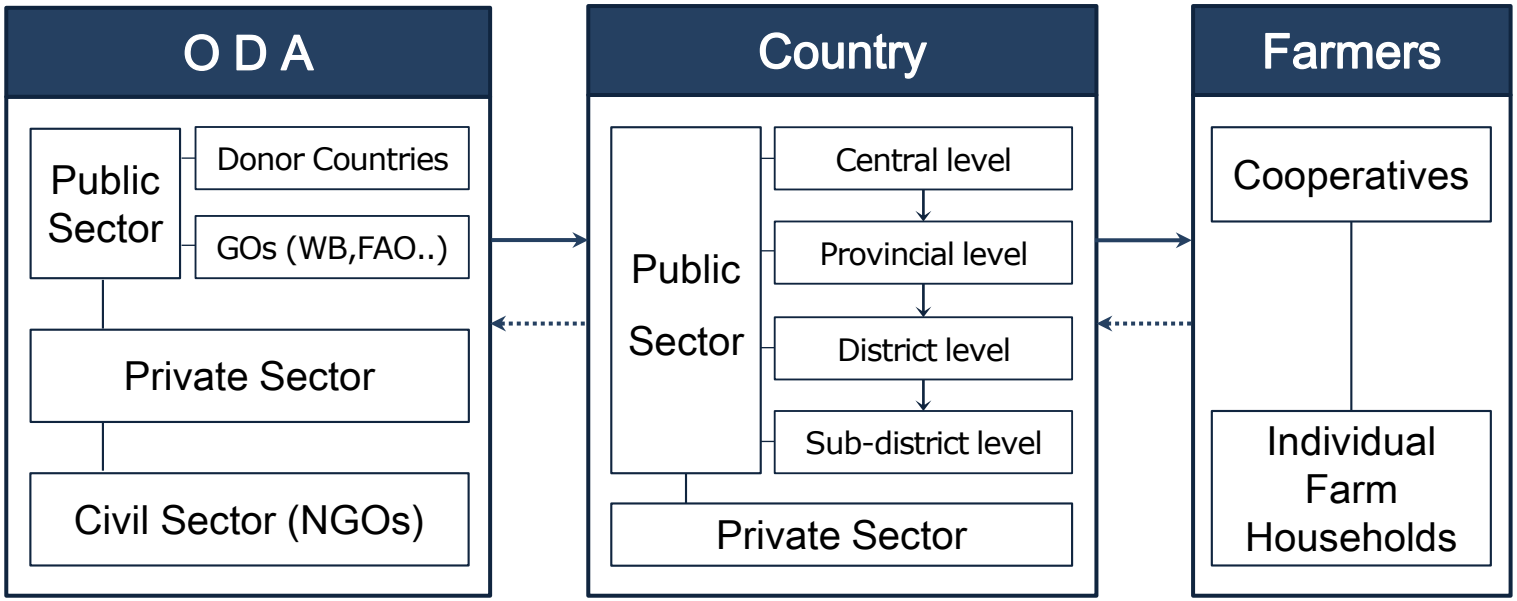
- The agricultural technology dissemination system can be identified by the functional level, like ***Research-Extension-Utilization***
  - ***Research-Extension-Utilizatio***n interaction influences the success or failure of the provision of agricultural technological information.



<Figure >Agricultural Technology Dissemination by Function

Framework for Analysis: Organizations

- The agricultural technology dissemination system can be identified by the organizational level as well, like ***ODA donors-Central government-Local government-Farmers***
  - Each institution has complexly operated the functions of the dissemination system.



<Figure >Agricultural Technology Dissemination by Function

Ⅳ. Agricultural Technology Dissemination System

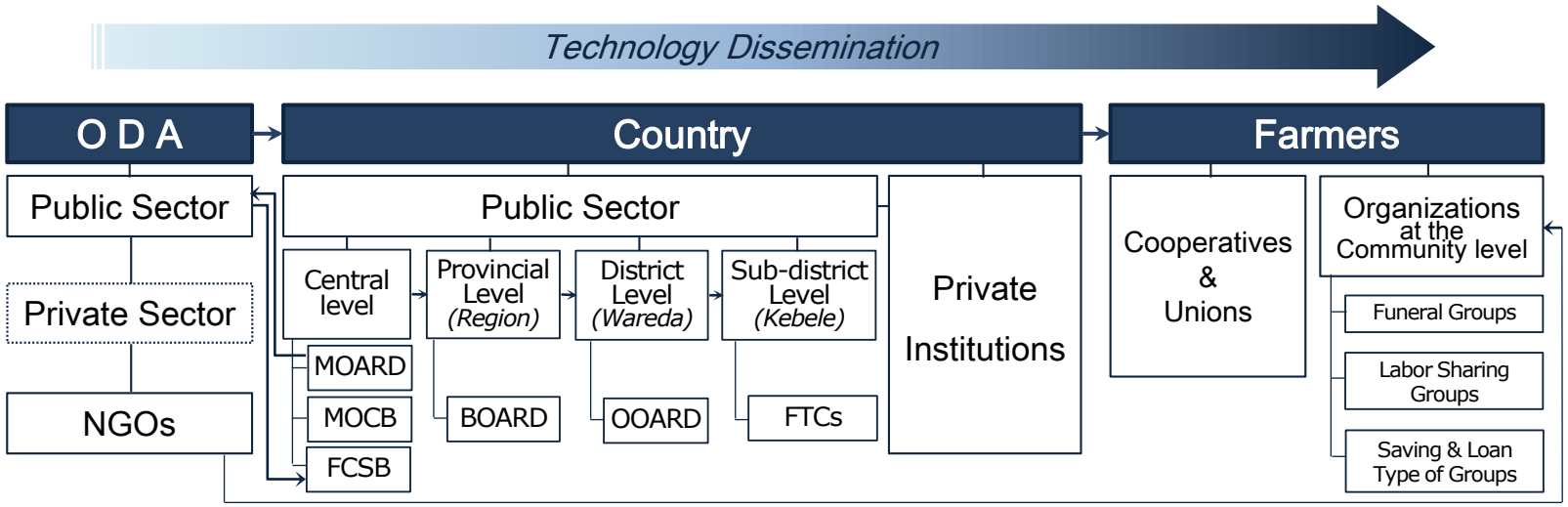
Current Situation of the System : Ethiopia & Uganda

<Table > Agricultural Technology Dissemination Environment

분 류		분석 지표		국가별 현황	
				에티오피아	우간다
기본 현황	(01)	인구 (명)		82,621,190	31,778,799
	(02)	GDP (US$, 백만)		26,860	14,440
	(03)	농업GDP (US$, 백만)		10,991	3,088
		GDP 대비 농업GDP 비중 (%)		41	21
	(04)	농지면적 (km2)		350,770	137,620
	(05)	농업부분 DAC국가 ODA 지출 (US$)		73,374,990	112,652,635
연구 (Research)	(06)	기술성숙도*		2.2	2.4
	(07)	농업 R&D 지출 총액 (US$, 백만, 2005기준 불변)	공공부문	15.7	30.6
			민간부문	-	0.4
			비영리부문	0	0.4
	(08)	농업 R&D 인력규모 (명, 전임연구원)	공공부문	1,318	298
			민간부문	-	8
			비영리부문	0	5
	(09)	농업종사자 1인당 공공부문 농업 R&D 지출 총액 (PPP$, 2005기준 불변)		2.24	8.35
	(10)	농업종사자 백만명당 공공부문 농업R&D 인력규모 (명)		43.05	28.35
지도 (Extension)	(11)	지도공무원(DAs) 수		45,812*	1,600**
	(12)	지방농민훈련센터(FTCs) 수		6,489*	-
활용 (Utilization)	(13)	농업 종사 인구 (명)		62,294,000	23,396,000
	(14)	1인당 농업 부가가치 (US$, 2000기준 불변)		209.3	203.6
	(15)	훈련 프로그램 참여 농가 수 (가구)			544,349
	(16)	농민조직 참여 농가 수 (가구)			906,273

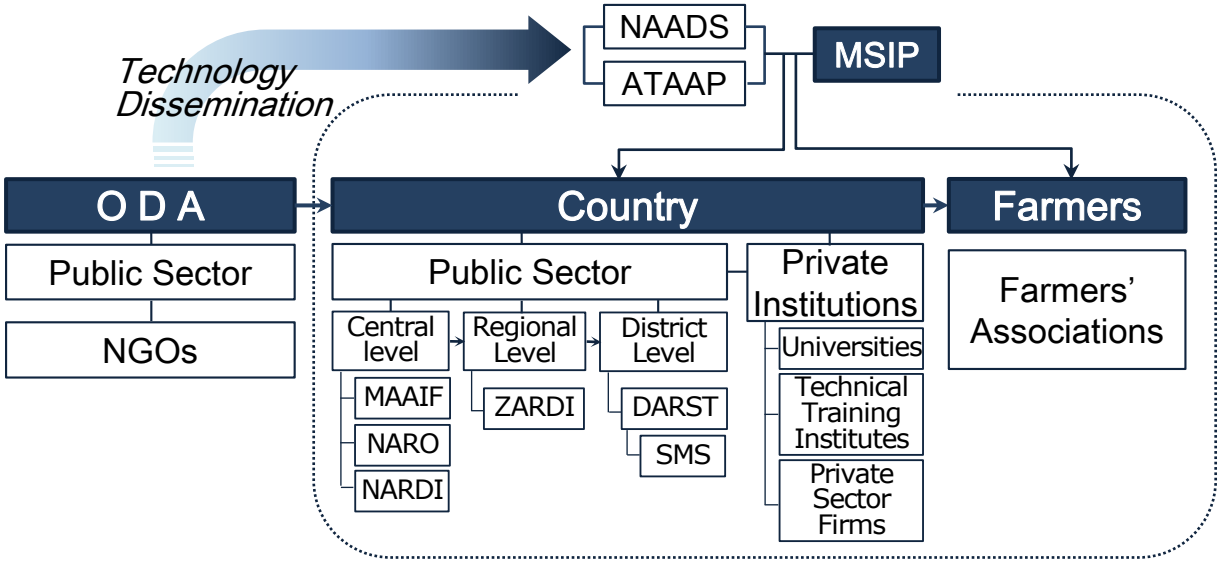
- Ethiopia puts an emphasis on ***Extension*** function, on the other hand, Uganda tries to operates the system mainly for ***Research*** function.
  - The Research-Extension-Utilization situation of Ethiopia shows the balanced level of labor force.
    - In particular, the ratio and the number of extension workers in public sector have exceeded those of Uganda.
  - In Uganda, relatively large-scale investment for research projects has been carried out, but human resources for research activities are scarce.
  - The analysis was performed on a limited basis, in consideration of the limitations about the data collection and evaluation basis.

- Ethiopia has established centralized top-down structure for the agricultural technology dissemination.
  - For the purpose of poverty reduction, the country has built the efficient system that the role of each agency has been defined clearly.
    - For example, in Ethiopia, NGO has mainly focused on socially marginalized group such as the poor and women.
  - Dissemination of agricultural technology at the national level pivots on MOARD (central level).
  - Peasant population, which is the final stage of agricultural technology transfer, is activated through a number of cooperatives and organizations.



Note: MOARD(Ministry of Agriculture and Rural Development) / MOCB(Ministry of Capacity Building), FCSB(Food Security Coordination Bureau) / BOARD(Bureaus of Agriculture and Rural Development), OOARD(The Woreda Offices of Agriculture and Rural Development) / FTCs(Farmers' Training Centers)

- Agricultural technology dissemination system of Uganda puts great emphases on decentralization and active participation of farmers.
  - Overall functions including practices and extension of the technology are operated through the NAADS (National Agricultural Advisory Service).
    - In addition, NAADS has enabled the participatory extension on the basis of the MSIP, a horizontal platform, with ATAAP (Agricultural Technology and Agribusiness Advisory Services Project) responsible for the research function.
  - Basically, through the activation of farmers' organizations which is the final destination of technology transfer, it tries to improve the responsibility of the farmers group and complement the extension function of public institutions.
    - Also, it strengthens the distribution of technology based on the needs of the field.



Note: MSIP(Multi-stakeholders Innovations Platform) / MAAIF(Ministry of Agriculture, Animal Industry and Fisheries), NARO(National Agricultural Research Organization) / NARDI(National Agricultural Research and Development Institute), ZARDI(National Zonal Agricultural Research and Development Institute) / DARST(District Adaptive Research Support Teams)

Diagnosis & Future Direction of the System

- For successful technology transfer and its sustainability, the limits and the direction of development from case countries have to be investigated.

1) Lack of temporal coherence with agricultural development stages

- The main purpose of the current system has a tendency to focus on strengthening research functions mainly in Uganda.
- However, in the context of the current agricultural environment of African countries, it is required to strengthen the extension competence to encourage the use of the technology.

2) Need for balancing *Supply and Demand*, and collaboration of counterparts

- Donor agencies have dominated the role of determining the technological demands and supplying them to the recipient countries.
- It is necessary for the recipient countries to derive their own demand and achieve technology transfer in the collaboration with donor countries.

3) Shortage of resources and capacity of technological extension at the local government level

- In order to respond diverse demands among regions (local areas), different strategies of the technology diffusion are required to satisfy the demand of each region.
- Therefore, it is necessary that the resources and the competence of local extension agencies should be strengthened.

4) Limited participation of farmers' group

- Active participation of farmers is essential for the development of the agricultural technology dissemination system.
- However, only a few among many of cooperatives carry out a technology transfer function.

V . Implication and Strategy

- What are the implications for ODA strategies on agricultural technology transfer?

For Donors

1) Donors must be careful to magnify the advantages of advanced technology.

- Providing advanced technologies only can not be a solution to agricultural problems in Africa.
- Long-term approach is required that assumes the realignment of the agricultural technology dissemination system.
- In case of KAFACI, there is a need to promote the reorganization of the extension strategy and technology transfer simultaneously.
- It is necessary the resources and the competence of local extension agencies should be strengthened.

2) Understanding agricultural technology extension system in individual recipient countries must be preceded.

- There exist different types of the dissemination system even among east African countries, for example, Ethiopia and Uganda.
- A variety of agricultural technology extension system are required on the basis of political, economic and social situation of each country.

3) The microscopic classification for spatial characteristics of agriculture in Africa is required.

- Distinction of characteristics, such as crops or planting environment, is needed from the early stage of project planning.
- We have to consider areas for implementing the ODA projects is possible to be different from the administrative division, taking into account the diversity of the areas.

For Recipients

- It is necessary for the recipient countries to construct needs and appropriate technologies by themselves.
- It is required to promote participatory extension system by fostering local extension agents and training the farmers.
- ODA fund can be utilized as a stepping stone to establish a solid agricultural technology dissemination system.

Q & A

감사합니다
Thank you
Merci
Asante
Ngiyabonga
Amesegënallô
Dankie