Strengthening competitiveness through better seed system

Madagascar PAPRiZ 1, Fertility evaluation of Malagasy soils by pot culture, J. Yamaguchi, June 2015

Shuichi Asanuma
Senior Advisor, JICA
Contents:

• Need for increased rice production
• Better seed required for competitiveness in rice
• Seed system
• Human resource and capacity building
Need for increased rice production
Change in rice production in SSA
Rice production and import in SSA

Two issues to be addressed:
• Increase of rice production
• Strengthening competitiveness

Source: All three figures are from JICA (2021, forthcoming) “CARD rice technical manual,” figures created using data retrieved from FAOSTAT’s “Crops” data (top left and bottom left) and “Food Balance Sheet” (top right).
Technical aspects for increased rice production

- **Productivity** (increased yield/ha)
  - High quality seeds
  - Paddy fields with infrastructure including irrigation facility
  - Good agricultural practices ex. Field preparation, water management, fertilization, plant protection
  - Harvesting, drying and other post-harvest technologies

- **Cultivation area** (extension to less favorable area)
  - Development of cultivation technology for newly-cleared and/or rehabilitated lands
  - Technology transfer and dissemination
  - Marketing of products ex. Quality, purity, no-contamination

Who is supposed to work for technology development?
Seeds for resilience and competitiveness
Seeds for resilience and competitiveness

CARD countries rely on imports to meet demand for rice, risking food security and foreign reserves

Consumers/traders prefer imported over local rice — low competitiveness

Quantity of locally produced rice is low

On-farm yield levels of local rice is low

Imported rice is less expensive than locally produced rice

Quality of locally produced rice is low

Quantity and quality of inputs, including seeds, used by farmers are inadequate

Unit cost of producing, milling and distributing local rice is higher than imported rice

Rice varieties attracting consumers are limited

Resilient varieties are not well developed or adopted

Local production is highly affected by external shocks (e.g., climate change) — low resilience

Farmers’ accessibility to better varieties is limited

Farmers/Consumers tend to prefer existing varieties rather than newly developed varieties

Capacity of research institutes and private sector to produce better varieties is limited

Source: Extract from the problem tree, developed by CARD Secretariat, modified for this presentation
Characteristics of Seeds improving resilience and competitiveness

● **Resilience**
  ➢ Tolerance to drought, cold stress and salinity
  ➢ Disease-resistance etc.

● **Competitiveness**
  ➢ High yielding
  ➢ Purity (Purified seeds: ex. PRODERIP (JICA TCP in Cameroon))
    (Quality Declared seeds): ex. In Uganda
  ➢ Fit to market preference

Who is supposed to work on seed system?
An example of Purified seeds
(JICA TCP: PRODERIP in Cameroon)

(Dr. Yoshimi Sokei, JICA expert)
Begun variety purification in 2014
Seed quality

Purified TOX  Non-Purified TOX
Table 6. Yield and Culm length, panicle length, and the number of panicles at harvesting between selected lines and non-selected varieties cultivated in UNVDA area. Lower case letters compare lines within each variety. The number followed by the same letter are not significantly different (P<0.05).

<table>
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<th>Variety</th>
<th>Lines</th>
<th>Yield (g/ m²)</th>
<th>Panicle Length (cm)</th>
<th>No. of panicles (hill⁻¹)</th>
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<sup>1)</sup> Bulk harvesting at maturing time in each plot level.

<sup>2)</sup> Harvesting each hill individually when each hill matured.

Purified seeds give higher yields, then competitiveness!
Seed system
Tripartite collaboration for seed system

- AfricaRice
- IRRI-Africa
- JIRCAS
- University

Breeding
- Breeder seed
- Foundation seed

Variety registration and Seed inspection
- Local adaptability selection
  - Registered seed

Needs seed inspection for certification
  - Certified seed

Rice farmers

- Government Authority
- National Agricultural Research Organization (NARS)

- Seed grower
- Seed farmer
- Seed company
Possible collaboration scheme in rice seed sector among IRRI, AfricaRice, JIRCAS, Japanese Universities and JICA in CARD 2

1. Breeding
   - AfricaRice, IRRI
   - JIRCAS & Japanese University

   Candidates of new varieties & Elite promising lines
   - Breeder seed
   - Foundation seed

2. Seed System in CARD 2 member countries
   - NARS Researchers
   - Seed technicians
   - Seed grower
   - Seed Farmer
   - Seed company

   Local Adaptability Selection and Registration
   - Registered seed
   - Genetic purification

   Capacity Development for Researchers
   - JICA: Development Studies Program (MSc and/or PhD) in collaboration with Japanese University

   Capacity Development for Seed Technicians etc.
   - JICA: TCP and/or Training Program

   Seed Multiplication
   - Certified seed

   Rice Production
   - Farmers

   Rice Breeding Task Force
   - Rice Sector Development Hub

   JICA: in-kind contribution

IRRI-Africa:
Breeding and Certified seed production of some CARD member countries

- Cameroon, Ethiopia, Ghana, Madagascar, Mozambique, Nigeria, Senegal, Sierra Leone, Uganda, Zambia

1. NARS works mainly on introduction breeding for the adaptability selection from among a set of promising lines of rice given by Africa Rice, IRRI and others and variety registration for her country;

2. Quality control is not well managed in most cases through the certified seed production due to several reasons such as seed contamination and imperfect seed inspection and so on;

3. There are some cases showing that high quality seeds selected from local varieties in the field could result in higher production of rice; and

4. If consumers change their preference to good quality rice with comparatively higher price, then rice farmers may be motivated to use certified quality seeds because such seeds are possible to give them more benefits.
◆ Common understanding on the benefits of good quality rice!

◆ Increase of needs for certified high quality seed.

◆ Needs human capacity building regarding the seed system.
Human resource and capacity building
Capacity development for NARS’s human resources

Needs (NARSs and Public sectors)

Researchers
- Rice breeding
- Crop physiology
- Agronomy
- Soil science
- Plant nutrition
- Pathology
- Entomology
- Others

Administrators

JICA Development Studies Program (MSc and/or PhD)
1. Registration to Japanese Universities
2. Conducting research in his/her country under supervision of Japanese supervisor and in collaboration with NARS and JICA TCP
3. KALRO-Mwea as an alternative experimental station, if agreeable (Research facilities including laboratory, experimental paddy fields and human capacity had been established through SATREPS 2013-2017)
4. Possible involvement of IRRI and/or AfricaRice, if agreeable, depending on locality

JICA Short-term Training Course
1. Several courses in Japan, not only for researchers but also for administrators, extension staff, seed technicians
2. Regional training in several African countries, Tanzania, Uganda, Senegal and Egypt which have long been supported by JICA (under negotiation)
Possible Outline of Capacity Development Scheme (MSc & PhD)

- **Member Country**
  - TRAINEEs who are C/Ps from:
    - JICA TCP,
    - AfricaRice and/or IRRI-Africa Project,
    - JIRCAS project,
    - Government administration

- **Japanese University**
  - Entrance Examination
  - RESEARCH TOPIC
    - Rice-related problem of his/her country or any problems in common
  - CONDUCTING RESEARCH
    - at JICA-TCP, AfricaRice, IRRI-Africa or KALRO-Mwea (Kenya)

**Joint Supervising Consortium:** Japanese University, JICA TCP, AfricaRice, IRRI-Africa and KALRO-Mwea (Kenya)
## Projected human resources for research in Phase 1

**(1st group)**

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*(NRDS)*
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Total, yearly: 9 13 15 12 15 11 7 12 94

24 Countries
94 trainees

(Short-term training course in Japan): DEVELOPMENT of CORE AGRICULTURAL RESEARCHERS for PROMOTION of RICE PRODUCTION in SUB-SAHARAN AFRICA (2012----)
Summary

Integrated approach utilizing various JICA’s ODA schemes in collaboration with the other steering committee members for the capacity building of researchers, extension workers and technicians regarding the seed system for rice promotion of CARD member countries

➢ Technical cooperation project
➢ Development study program (Msc. and PhD)
➢ Short-term training course
➢ Grant-aid
➢ others
Collaboration for sustainable future

CARD Partners

Steering Committee

Development Partners

CARD Member States

- AfricaRice
- IsDB
- AGRA
- JICA
- JIRCAS
- FAO
- NEPAD
- FARA
- World Bank
- IFAD
- WFP
- IRRI

Map of Africa showing group countries.
Strengthening competitiveness through better seed system

Sustainable rice production requires human capacity for seed system under continued government support towards resilient and food secured society

Thank you for your attention