

REALIZING AFRICA'S RICE PROMISE

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ABSTRACT

Rice consumption in Africa is increasing rapidly because of changes in consumer preferences and urbanization. In 2009, the continent imported one-third of what is available on the world market, costing an estimated US\$ 5 billion. Soaring and highly volatile rice prices and relatively low levels of global stocks are predicted to remain the norm over the next 10 years. As witnessed by the food crisis in 2008 this is a very risky, expensive and unsustainable situation, and it may lead to severe food insecurity and civil instability in some African countries. However Africa has the human, physical and economic resources to produce enough rice to feed itself and many national, regional and continental rice sector development initiatives have seen the light since the food crisis. The critical challenge facing the African rice sector is to enhance performance in production, processing and marketing to respond to a major concern to be turned into an opportunity: the growing demand for rice as a preferred staple.

The Africa Rice Center (AfricaRice) is a pan-African research organization, that currently includes 24 member states, working to contribute to poverty alleviation and food security in Africa through research, development and partnership activities aimed at increasing the productivity and profitability of the rice sector in ways that ensure the sustainability of the farming environment. AfricaRice is also a member of the Consortium of International Agricultural Research Centers (CGIAR). During its 28th Ordinary Session, held in September 2011 in The Gambia, AfricaRice's Council of Ministers approved the Center's 2011-2020 Rice Research for Development strategy. Through a priority setting process, seven Research for Development (R4D) Priority Areas (PAs) were identified that are considered crucial to realize Africa's rice promise:

1. Conserving rice genetic resources and providing climate-resilient rice varieties to smallholder farmers that are better adapted to production environments and consumer preferences
2. Improving rural livelihoods by closing yield gaps and through sustainable intensification and diversification of rice-based systems
3. Achieving socially-acceptable expansion of rice producing areas, while addressing environmental concerns
4. Creating market-opportunities for smallholder farmers and processors by improving the quality and the competitiveness of locally produced rice and rice products
5. Facilitating the development of the rice value chain through improved technology targeting and evidence-based policy making
6. Mobilizing co-investments and linking with development partners and the private sector to stimulate uptake of rice knowledge and technologies
7. Strengthening the capacities of national rice research and extension agents and rice value chain actors

AfricaRice will act as both a developer of and a broker for rice knowledge and will tap sources from within and outside the African continent, with each partner contributing to the rice R4D agenda according to its comparative advantage. PAs 1 – 5 will result in new rice technologies that will make a positive, sustainable and lasting difference in the livelihoods of farmers and other rice value chain actors. Through PA6, links will be established with large rice sector development initiatives and the private sector to obtain co-investments to stimulate uptake of appropriate rice knowledge and technologies and to obtain feedback on technology performance. PA7 addresses the desperate lack of trained capacity across the rice value chain and in rice research and development in Africa. Across priority areas, there is a need for working closely with women farmers, researchers, extension agents and agribusiness women in order to maximize efficiency, effectiveness and impact.

The strategy will be mostly (with the exception of PA3) implemented under the umbrella of the Global Rice Science Partnership (GRiSP), led by IRRI, a CGIAR Research Program (CRP), with other CRPs contributing to specific Priority Areas. AfricaRice is one of the architects (with IRRI, CIAT, JIRCAS, IRD

and CIRAD) of GRiSP, leads GRiSP activities in Africa and will ensure that through its active role in the CRPs, global knowledge is mobilized to respond to the challenges and opportunities in the 7 Priority Areas.

Collaboration with NARS will be re-enforced through the establishment of Task Forces; collective research for development efforts on critical thematic areas in the rice sector, based on the principles of sustainability and build-up of critical mass at the national and regional level. The following Task Forces have been or will be established: Rice Breeding Task Force (PA1); Rice Agronomy Task Force (PA2 and PA3); Rice processing and value addition Task Force (PA4); Mechanization Task Force (PA2, PA3, PA4); Rice Policy Task Force (PA5); Gender Task Force (cross-cutting). Collaboration will also be re-enforced with FARA, the sub-regional research fora, and national rice centers of excellence within the framework of the West Africa Agricultural Productivity Program (WAAPP) in Mali and the East Africa Agricultural Productivity Program (EAAPP) in Tanzania, sponsored by the World Bank.

Task Force activities and much of the work in the CRPs will be thematic in nature, contributing to PA1 – PA5, but research outputs will be integrated in ‘Rice Sector Development Hubs’ (‘good practice areas’) to achieve development outcomes and impact. Rice Sector Development Hubs involve large groups of farmers and other value chain actors, such as rice millers, input dealers and rice marketers. These partnerships will be testing grounds for new rice technologies and new institutional arrangements (contracting) between value chain actors and follow a ‘reverse-research approach’, i.e. starting from the market. Partners will pursue a ‘proof of concept’ approach to rice value chain development, productivity improvement and sustainable management of natural resources in rice-based systems based on innovative approaches to collective action and governance. The objective is to produce rice or rice-based products that respond to consumer preferences in urban and rural markets in quantities that are of interest to rice traders, who would usually import such products.

Hubs will represent key rice ecologies and different market opportunities across AfricaRice’s 24 member countries and will be linked to major national or regional rice development efforts to facilitate broader uptake of rice knowledge and technologies. Care will be taken that women and youth are not marginalized, but on the contrary strengthened in the process of rice value chain development. At least 30 of such Rice Sector Development Hubs will be established across Africa by 2020. Civil society organizations (CSOs), including farmer organizations and NGOs will be involved in technology adaptation and wide-scale diffusion in the Rice Sector Development Hubs and provide feedback to researchers and policy makers on technology performance and research and investment priorities.

Collaboration with the private sector may involve contributions to strategic and applied research in one of the PAs, or to ‘proof of concept’ work in the Rice Sector Development Hubs. This will include companies involved in farm inputs (seeds, farm machinery), credit provision, processing and marketing. Private companies will also serve as technology diffusion channels.

Linkages will be strengthened with regional economic communities to assist with policy formulation and building of rice research and extension capacity. Links will also be re-enforced and expanded with international and regional development funds, banks and donors, in particular those regrouped in the Coalition for African Rice Development (CARD). Many of those directly contribute as donors to the R4D activities that will be implemented under this strategy. Rice Sector Development Hubs will as much as possible be established in regions that benefit from large-scale bilateral or multilateral investments of these agencies in rice sector development to build capacity and to facilitate out-scaling of rice knowledge and transforming research outputs into development outcomes and impact.

Well-designed monitoring and evaluation systems, adoption studies and ex-post impact studies will accompany the implementation of this strategy, enabling regular reviews of strategic choices made. It is estimated that by 2020, benefits generated by this research agenda will have contributed to moving Africa’s rice self-sufficiency level to at least 80%, whilst lifting millions of African rice producers and urban and rural rice consumers out of poverty.

KEYWORDS

Africa, rice research and extension, rice value chains, rice sector development, priority setting, out-scaling.

Realizing Africa's Rice Promise

Marco Wopereis

Africa Rice Center (AfricaRice)

JIRCAS 2011 International Symposium
Tsukuba, Japan, 14-15 November 2011



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Contents

- Why now?
- What can research offer?
- How to link with development initiatives?
- Conclusions



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World rice price

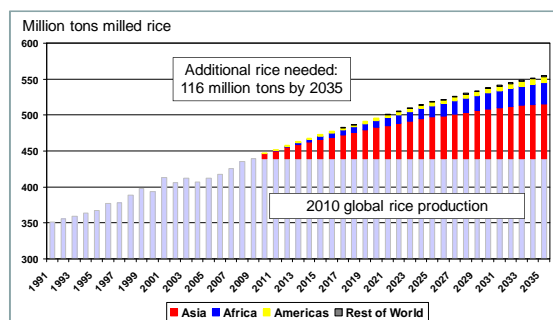
Indice des prix mondiaux OSIRIZ/InfoArroz

base 100 = janvier 2000
source: Osiriz/InfoArroz



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World rice consumption



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Risks to food security

- Soaring and highly volatile rice prices
 - Relatively low levels of global stocks
 - Current rice exporters may turn into importers
- > Relying on the world market to supply rice to African consumers is becoming a very risky, expensive and unsustainable strategy
- > It may lead to severe food insecurity and civil instability
- > Turn this into an opportunity for Africa



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Rice farming communities ready to move on



Presidential Brief
Agricultural Transformation Agenda

We will grow Nigeria's agricultural sector

September 9th 2011

Presentation made by the Honorable Minister of Agriculture to the Economic Management Team

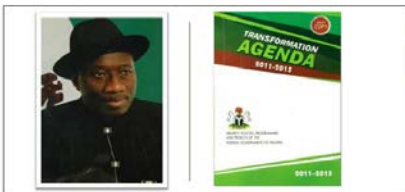
Confidential

Federal Ministry of Agriculture and Rural Development | 0



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Agricultural Transformation Agenda
Directly building on Mr. President's Transformation Agenda




The Agricultural Transformation Agenda

"Nigeria can no longer continue to be a sleeping giant; we have to wake up and if we wake up, we must begin to do things differently"

- His Excellency, President Goodluck E. Jonathan GCFR, President, Commander in Chief of the Armed forces of the Federal Republic of Nigeria

Federal Ministry of Agriculture and Rural Development | 1



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THE FOURTH GENERAL MEETING OF THE COALITION FOR AFRICAN RICE DEVELOPMENT
KAMPALA, UGANDA, 8 - 9 NOVEMBER 2011

LA QUATRIEME ASSEMBLEE GENERALE DE LA COALITION POUR LE DEVELOPEMENT DE LA RIZICULTURE EN AFRIQUE
KAMPALA, UGANDA, 8 - 9 NOVEMBRE 2011



Uganda

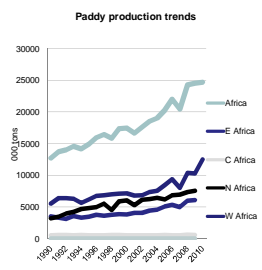
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Significant increase in rice production since the rice crisis

- Production rose from 20.4 to 24.7 MT between 2007 and 2010*
- Since the crisis, 17 countries registered a 2 digit annual production growth, incl.: Gambia 163%; B Faso 76%; Senegal 61%; Ethiopia 49%; etc.
- NERICA area increased from 200,000 ha to 700,000 ha between 2006 and 2010**

Paddy production trends



Source: FAO STAT 2011
*FAO Rice Market Monitor, July 2011
** African Rice Initiative, 2011

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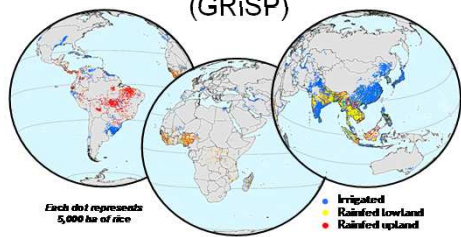
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CGIAR Thematic Area 3:
Sustainable crop productivity increase for global food security

A Global Rice Science Partnership (GRISP)



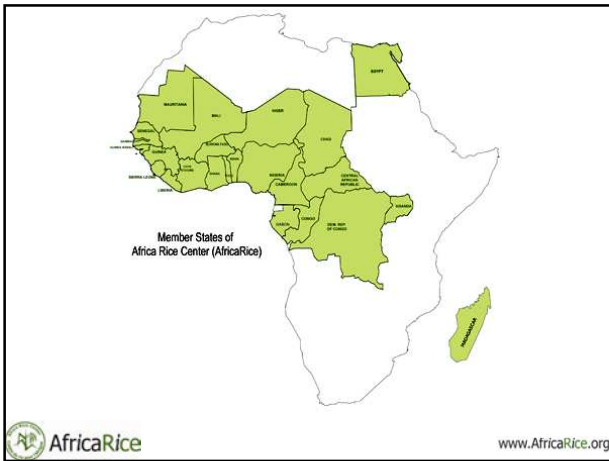
Each dot represents 5,000 ha of rice

- Irrigated
- Rainfed lowland
- Rainfed upland

An evolving alliance of IRRI, AfricaRice & CIAT with Cirad, IRD, JIRCAS and hundreds of research and development partners worldwide

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Building critical mass in rice research

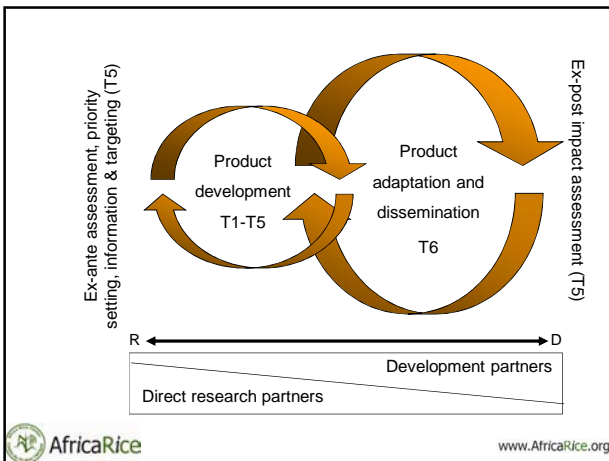
- Revitalize 'Task Force Mechanism' (strong recommendation from the Africa Rice Congress)
- Task Force: 'A collective research for development effort on critical thematic areas in the rice sector, based on the principles of sustainability, build-up of critical mass and ownership by the national research systems'

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Approach

- Product-oriented, demand-driven research, geared towards impact from 'gene' to 'policy'
- Thematic research through and with NARS (Task Forces)
- Thematic research linking with global partners (CRPs)
- Integration of knowledge: 'Rice Sector Development Hubs' with public and private sector partners
- Consideration of gender to enhance efficiency and impact of research
- Prediction of climate effects on rice production systems and development of adaptation mechanisms

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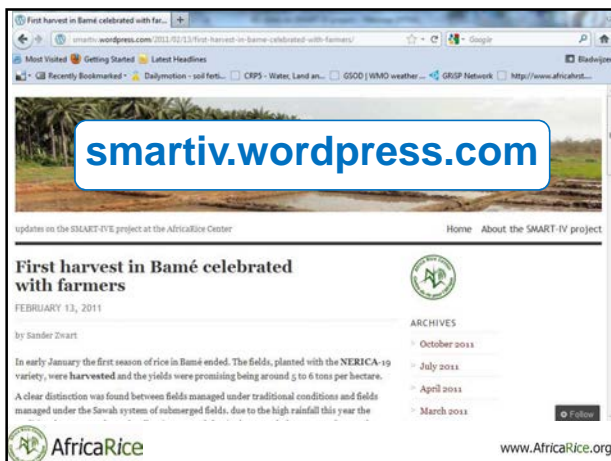
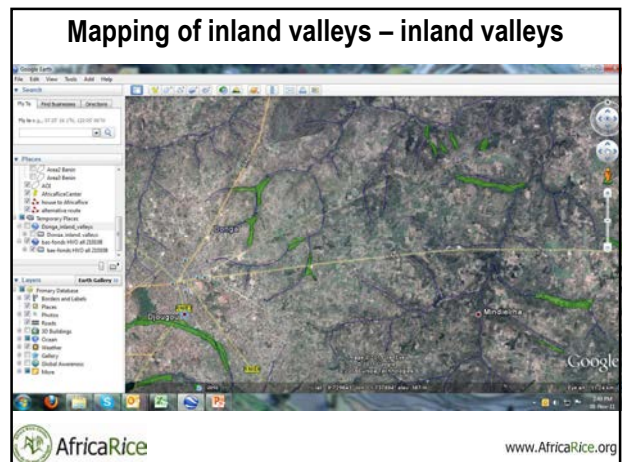
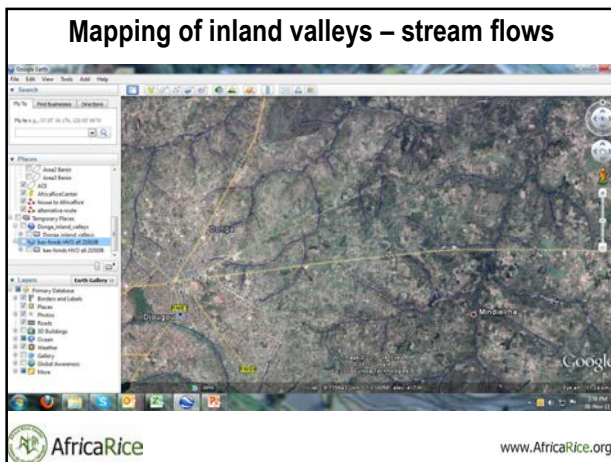
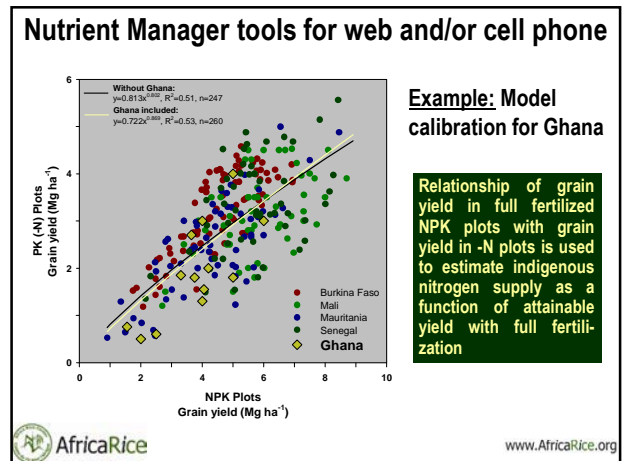
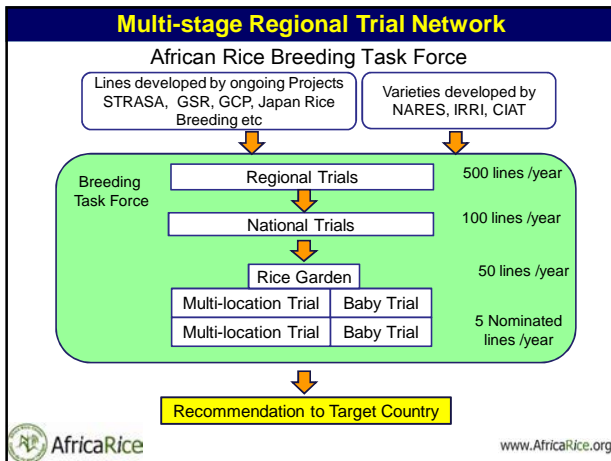


Field screening of NILs in a RYMV hotspot at Edhozigi (Nigeria): November 2010

FKR28 NIL 16 NIL 130 IR64
 FKR28 + FKR28 + IR64+
 rymv1-2 rymv1-2

These lines (BC_3F_3) will be evaluated for overall agronomic traits in Regional Trials 2011 under Breeding Task Force

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Competitiveness of local production

- Studies carried out before and after the rice crisis confirm that domestic resource costs are lower than 1
- Local rice sectors are economically profitable

Country	CRD
Benin	0.44
Burkina-Faso	0.33
Ghana	0.97
Guinea	0.68
Rwanda	0.78
Senegal	0.75

The domestic resource cost is the ratio between the value of internal factor (non-exchangeable inputs such as labor, land and capital) evaluated at their opportunity costs and the added value generated by the production of a unit of rice

Sources: Adegbola et al, 2011, Ouedraogo et al, 2011, Wiredu et al, 2011, Dieng et al 2011, Diawara et al 2011, Ingabire et al, 2011, Dieng et al, 2011



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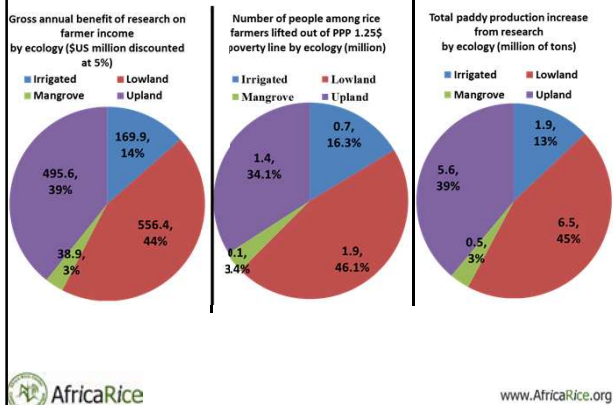
Vision of success

- Improving food security:** Africa's rice production increased by 21 Mt, reaching a rice self-sufficiency level of 80% by 2020 through higher and sustainable average yields (4.0% per year) and a sustainable increase in harvested area (2.4% per year).
- Reducing rural poverty:** Research products will lift 4 million people (farming households) and 8 million urban and rural rice consumers above the \$1.25 poverty line in 2020.
- Reducing under nutrition:** through increased purchasing power: people will reach caloric sufficiency
- Sustainable management of natural resources:** water, nitrogen, and labor efficiencies in irrigated systems improved; ecological intensification and diversification in rainfed systems (closing yield gaps); genetic diversity enhanced; 'future' options to cope with climate change and water scarcity available
- Capacity development:** 30 PhD and MSc fellowships yr⁻¹; > 100 technicians from NARS, NGOs or development projects trained each year through 'season-long' hands-on rice production training courses



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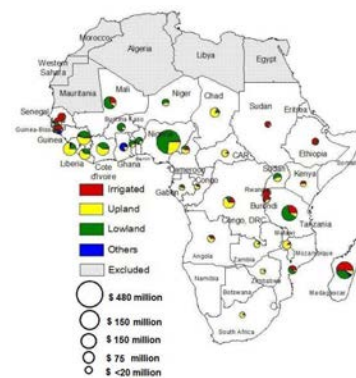
Priority by ecology



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Country disaggregated results: annual income gain

- Highest impact: Nigeria (\$480 million), Madagascar (\$150 million), Guinea, Mali, Côte d'Ivoire, Tanzania
- In general lowland comes at first position mainly in Western African countries (Nigeria, Benin, Burkina)
- Irrigated ecosystem has the highest impact in Senegal, Rwanda and Madagascar
- Upland come first in Guinea, Côte d'Ivoire, Sierra Leone, Liberia and in Central African countries



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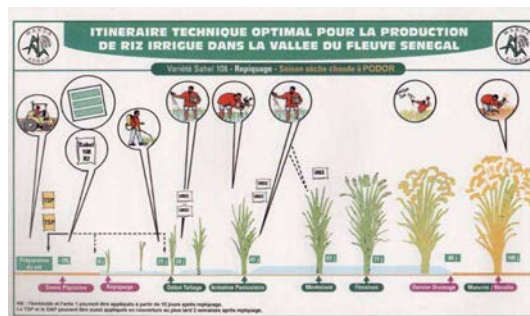
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Cropping calendars



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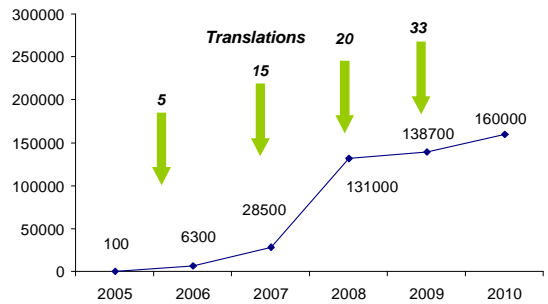
Videos

- CASHING IN WITH PARBOILED RICE (12:37)
- IMPROVING RICE QUALITY (13:26)
- SEED PRESERVATION TECHNIQUES (07:05)
- WELL-DRIED SEED IS GOOD SEED (06:20)
- SEED CLEANING BY FLOATATION (06:35)
- SPOTTED SEED MEANS DISEASED SEED (07:29)
- MANAGING SOIL FERTILITY FOR HEALTHY RICE (18:44)
- RICE WEED MANAGEMENT (17:00)
- RICE TRANSPLANTING (14:15)
- RICE SEEDBED PREPARATION (17:42)
- LAND PREPARATION (10:23)



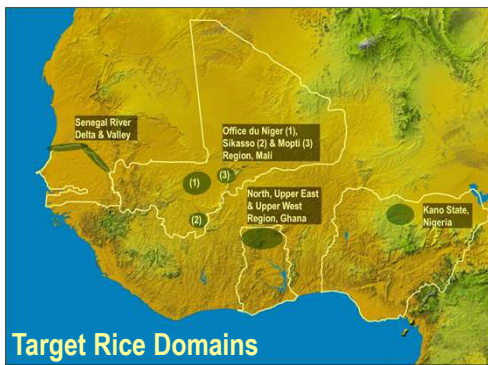
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Number of farmers reached with videos



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Nutrient Manager tools for web and/or cell phone



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UNDP Project:

“Enhancing livelihood in post-conflict Liberia through rebuilding capacity for rice production”

- Certified seeds are being produced in selected pilot villages in the three countries (CBSS); 65 tons of 10 varieties supplied to farmers



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Japan-AfricaRice Emergency Seed Project



Contribution to the Emergency Rice Initiative:
Improving farmer access to quality rice seed in Africa



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Rice sector development hubs

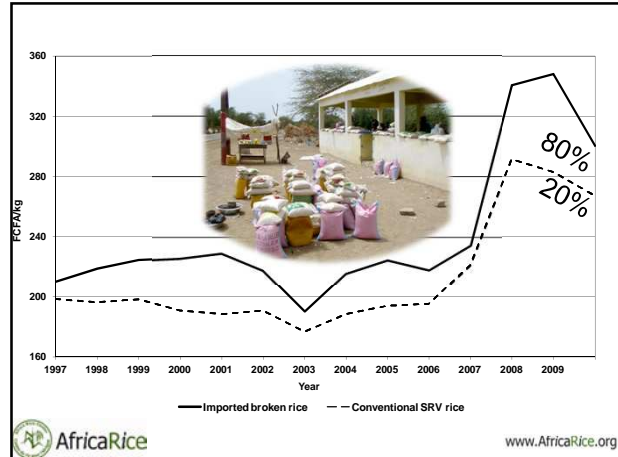
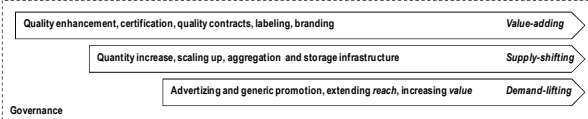
- Partnerships involving large groups of farmers (typically 3,000 to 5,000 farmers) and other value chain actors, such as rice millers, input dealers and rice marketers
- ‘Proof of concept’ approach to rice value chain development and sustainable management of natural resources in rice-based systems
- These hubs are testing grounds for new rice technologies and follow a ‘reverse-research approach’, i.e. starting from the market.
- Hubs will represent key rice ecologies and different market opportunities across African countries and will be linked to major national or regional rice development efforts to facilitate out-scaling.



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Policy lessons from Senegal

- Policy sequencing = necessary for upgrading SRV rice value chains
- Proposed three-stage policy sequence for upgrading SRV rice value chains:



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Conclusions

- Boosting the Africa rice sector is crucial to feed Africa and avoid another rice crisis
- Excellent opportunities exist
- Re-enforce and leverage NARS capacity through the Task Force mechanism
- Capture global synergies through GRiSP
- Establish rice sector development hubs to do 'proof of concept' work with private sector, NGOs, national partners
- Build on country and regional initiatives to boost the rice sector (CARD)

Thank you



Marco Wopereis

[SLIDE 1]

Good afternoon ladies and gentlemen. It is a big honor for me to be among the keynote speakers today and I would sincerely like to thank JIRCAS and its President Dr. Iwanaga for having me invited to speak to you on this topic, "Realizing Africa's Rice Promise." A very ambitious title and the promise really is how can we make sure Africa can feed itself in terms of rice or at least reduce the reliance of Africans on the world market.

[SLIDE 2]

I will go through three topics. I will first talk about why we really need to realize that promise right now. I think there is an urgent need to do so and it is the right time, with many factors coming together. I am quite optimistic that we can realize that promise, or at least make a dent into the imports that are still needed right now.

I also would like to talk about what research can offer. I'll just give you some examples, like Dr. Dobermann did as well just now. Next I will talk about the need to link with development initiatives. Research is just one player in the development of the rice sector in Africa and we have to make sure that development initiatives from the public and the private sector link with these efforts, otherwise research doesn't make any sense. I will end my presentation with some conclusions.

[SLIDE 3]

This graph shows the fluctuation of the world rice price over the last few years. Dr. Concepcion has already talked a lot about this. Dr. Iwanaga in his introductory remarks also mentioned this volatility of rice prices which seems to come down a little bit now. But still for a continent that relies so much on imports, it is a frightening graph if you look how prices fluctuate, whilst showing an upward trend. This is the situation between 2009 and 2011 excluding what happened in 2008. Everybody knows that then rice prices went through the roof.

[SLIDE 4]

If you look at world rice consumption – this is a graph made by colleagues from IRRI - you can see that we need a lot more rice in the future obviously, but also that a lot of this extra rice will be needed in Africa. This is completely in line with what just was said by Dr. Concepcion. Just to give you an example, of the 116 million tons that we will need by 2035, about 11 million tons will be needed in Nigeria.

Just to look at that in more detail: the current population of Nigeria is 150 million. By 2035, it will be more than 300 million people. It's going to be one of the most populous countries on earth, and that country alone will need an extra 11 million tons of milled rice by 2035. This fits very nicely with the rule that Dr. Dobermann mentioned in the beginning, i.e. that for every 1 billion people we need 100 million tons of paddy rice.

[SLIDE 5]

The fluctuation and increasing trend in rice prices presents a clear risk to food security in Africa. The second point, relatively low levels of global stocks, is perhaps less of a problem, because we have heard from Dr. Concepcion that they have increased quite a bit recently. , But is important to remember that in 2008, Africa was shaken by the fact that rice exporters just closed borders, which meant riots in the streets in major capitals in West Africa and in Madagascar. Rice is life for Africans, especially in countries such as Madagascar, Liberia, and Sierra Leone. The rice consumption per capita in these countries is comparable to the per capita rice consumption in the Philippines or even higher.

Relying on the world market, therefore, is a risky strategy, it's very expensive, and I think it's not really sustainable. We have seen that it may lead to civil instability. Governments have fallen over problems with rice in Africa. But the good news is, I think, that there is a lot of scope to turn this situation into an opportunity for Africa, and to realize Africa's promise and that is what I will talk about.

[SLIDE 6]

There is a lot of enthusiasm right now in Africa. Rice farming communities are ready to move on. Unfortunately, they are very much doing everything still by hand. One key factor for rice cropping in Africa will be to add energy to the systems, in terms of land preparation definitely, and also in terms of harvest and post-harvest practices. Many things can be learned from what is being done in Latin America and in Asia, of course, and the Global Rice Science Partnership we are all very proud of will help us a lot in that respect.

[SLIDE 7]

It is important to note that there is a lot of government backing for rice development right now in Africa. Through the CARD Initiative, we have helped 21 countries to develop national rice development strategies. There are very good strategies out there right now for many countries and many of them are backed by presidential initiatives for example in Senegal, Mali and Ethiopia. I have here the example of Nigeria on the screen, a speech made by the Minister of Agriculture in September, Dr. Akin Adesina, who happens to be an ex-AfricaRice staff, and he is really pushing the development of the rice sector in Nigeria big time.

Dr. Concepcion predicted in her presentation earlier today that Nigeria will import 3 million tons of rice by 2020, up from the current 2 million tons per year. I am sure she is right, if nothing is changing.

However, the Nigerian minister wants actually to get rid of these imports over the next 5 years by massive investments in rice infrastructure and good policies. This is called the 'agricultural transformation agenda'. I just used this as an example because I could also have spoken about Mali, for example, or Senegal.

[SLIDE 8]

You see here a quote by The Nigerian president Jonathan Goodluck: 'Nigeria can no longer continue to be a sleeping giant. We have to wake up and if we wake up we must begin to do things differently'. Clearly, there is a tremendous commitment from the president and from the Minister of Agriculture to make the necessary changes to move the rice sector in Nigeria forward.

One of the things they want to achieve is that African agriculture is no longer considered a development project. Instead we should have a clear strategy, get rid of heavy-handed government interventions and promote private sector development. A lot of policies are being put in place to make these private sector developments happen by tax breaks, tax holidays and also by getting rid of taxes on import of machinery, especially on rice processing equipment.

There is also a lot of ambition to improve existing irrigation infrastructure and to develop new irrigation infrastructure.

[SLIDE 9]

There are therefore a lot of conditions coming together right now, to make Africa's rice promise a reality. One key catalyzer has been and still is the Coalition for African Rice Development (CARD) a Coalition of Donors and Doers from the Research and Extension side. This slide shows a snap shot of the fourth CARD general meeting held last week in Uganda.

[SLIDE 10]

I think we can be quite optimistic about how rice production is developing in Africa. We can see on this graph, based on FAO figures that rice paddy production increased from 20 to 25 million tons between 2007 and 2010. We are still importing 10 million tons every year. So basically, what we see over the last 3-4 years is that the gap between consumption and what is produced in Africa, is not widening. We are currently able to keep these imports at 10 million tons per year, despite that fact that consumption is increasing by 7% or more per year.

The fact that Africa is able to keep that gap stable is already a tremendous achievement, because consumption levels are very high because of population increase of course, but also because of rapid urbanization in Africa, and that means that people will eat more rice.

Another important thing worthwhile noting is that the area under NERICA cultivars is increasing quite substantially. This is an achievement realized in large part through the support by the people of Japan, JIRCAS and JICA.

[SLIDE 11]

What can research offer?

[SLIDE 12]

Well, this slide was already shown and I think GRiSP, the Global Rice Science Partnership, basically means that the CGIAR centers working on rice are working hand-in-hand instead of competing for projects which happened in the past. We have divided tasks based on comparative advantage and we are very proud that the co-architects of this particular partnership also included JIRCAS and two French research institutes CIRAD and IRD. That is the core

group, these six institutes working together. But there are many other partners connected to these six.

[SLIDE 13]

AfricaRice has the responsibility for Africa in this partnership and that is not a small job. Africa is huge. If you just think of Western Europe, all those countries fit in one in Africa: the Democratic Republic of Congo. Distances in Africa are very large, and it is an enormous challenge actually to coordinate research efforts across the continent.

SLIDE 14

We coordinate research with five research stations. We are based in Benin, which is currently our temporary headquarters. We are also based in Nigeria obviously.

We have our headquarters, our true headquarters in Côte d'Ivoire where we had to leave in 2002 because of the civil war, but with the current political situation improving we are confident that we will be able to reuse the facilities which means 780 hectares of experimental land across all rice ecosystems and access to laboratories, offices, a conference centre and a library that are still in a very good shape, waiting to be re-used to the fullest. We also have station in Senegal and a joint station with IRRI in Tanzania.

Well, still this is a drop in the ocean if you think of the size of Africa, so we really have to rely on the national systems. Estimates are that there are currently perhaps 200 to 220 researchers in Africa working on rice and that is not full time, and 50 of those are in Egypt. There is a tremendous shortage of research capacity in Africa, and I think there again GRiSP can have a tremendous impact, but we have also bundled the scarce forces that are still there at NARS level in what we call 'Task Forces'.

[SLIDE 15]

For example, we have a rice breeding task force. It includes the breeders of IRRI, AfricaRice, based in Africa and the other breeders that we know of working in Africa at national level. This way we combine forces and distribute tasks. A country like Nigeria has only one rice breeder right now, which is clearly insufficient, but that breeder can at least leverage knowledge and varieties through the Task Force.

[SLIDE 16]

The approach is very much product-oriented approach, like Dr. Dobermann has outlined already, from gene to policy because if you want to do something about the rice sector it's not going to be enough to only think of a variety, it's not going to be enough to only think of a policy, you have to think of all elements and bring these together.

We do thematic research, because that is just more efficient, through our taskforces within Africa and through GRiSP linking those taskforces and the researchers in Africa globally with researchers like people who are in this room. But what we do not forget is that we want to integrate that knowledge working with different partners and make it happen in what we call 'Rice Sector Development Hubs'.

I will come back to that, but it is very important because we are not a university, we are not producing knowledge for knowledge, we produce knowledge for impact, and you can only have impact if you work with many partners from the development side, including the private sector. We are currently setting up these hubs in many countries spearheaded by funds provided by the Syngenta Foundation.

We need to absolutely consider gender issues. Women are actually the ones that do most of the work in Africa, if you look at the production side and certainly at the processing side as well. We need to take into account special needs for women and as I think about gender I also include youth. If you think of Nigeria, one out of two Nigerians between 18 and 25 are without a job. If these people do not get a job soon, I think we are going to be in major trouble. That means that we have to make agriculture attractive and make it a business. If you want to do everything still by hand, make your paddy bunds by hand, level the field by hand, working on heavy clay soils, it's not going to be very attractive.

Climate change was also already mentioned. This is just to show you how things are integrated.

[SLIDE 17]

We work on products around these five themes within GRiSP that we have globally and within Africa, but we really have this other circle there to make sure that we scale out those results. Dr. Rodenburg mentioned earlier

about bringing things together in an integrated manner and that is what we want to do in theme six, and it requires different partners, different partners from strong NGOs, from extension services, and of course from farmer organizations.

[SLIDE 18]

Just a few highlights now. I'm just walking a bit through the themes of the Global Rice Science Partnership. This is work on rice diseases. This is a nasty disease called rice yellow mottle virus that only exists in Africa and through marker assisted breeding we have now upgraded some key varieties with a gene that confers resistance to some of the most prominent isolates that we have in West Africa.

This particular gene will probably not work in Central Africa or in East Africa, so there is still a lot of work to be done here. This type of sophisticated work I think is very much profiting from IRD, the French Research Institute involved in GRiSP. JIRCAS is very much involved in our work on blast.

[SLIDE 19]

In any case these varieties, once we have them in our hands, we will move them into a taskforce mode. I'm sure that Dr. Kumashiro will talk about this more tomorrow. We have now a very systematic manner, systematic way of evaluating varieties across the continent, instead of everybody doing everything. We don't do that. We divide tasks.

We have certain breeders from IRRI looking at a certain mega environment and we have certain breeders from AfricaRice looking after a certain mega environment working with the national breeders to evaluate varieties in a very systematic manner, from regional trials to national trials and to trials with farmers in a participatory manner, and finally getting to some three, four, five varieties that do better than what farmers have right now, of course very much involving farmers in that type of evaluation.

The sources that we use come from different projects funded by the Generation Challenge Program or by the Gates Foundation, it doesn't matter. Also the way these varieties were developed, whether they were intraspecific or interspecific or whether they were induced by marker-assisted breeding, in the end the farmer doesn't care as long as it makes a difference to him or her, and to the consumer of course. That is often forgotten: we really need to think about the market segment we are targeting when we do rice breeding.

This particular taskforce is totally funded by the Japanese government. We are very grateful for that because it provides us with certainty for funding for 5 years. Of course, we would like this to be continued beyond those 5 years because breeding is never finished.

[SLIDE 20]

This is a very complicated slide showing the relation between nutrient uptake between plots with and without fertilizer N, but I'm quite proud of it because when I was an agronomist in the 90s and Dr. Dobermann as well, we were both working on this topic. Data we gathered in those days and right now are very much in line and what we hope now is that we get to a nutrient management tool that can be used on mobile phone technology to give recommendations on fertilizer management to farmers in Africa. I will come back to where exactly in Africa in a minute.

[SLIDE 21]

An ecology that is still vastly underused in Africa are the inland valley systems, and now JIRCAS is doing a lot of work on that in Ghana. There is an estimate that there are about 200 million hectares of these inland valley swamps available. Of course, they also have environmental services. We cannot just convert everything into agriculture and ignore the environmental services of these lowlands. But if you have 200 million hectares and if you just convert a fraction of that for rice you can just make a tremendous impact, and right now we are looking at where the inland valleys are that are best suited for rice development using satellite imagery.

[SLIDE 22]

We are actually relying on the Japanese Space Agency, believe it or not! They provide us with data and we use that to work on digital elevation models, which gives us an idea where the stream flows are in these countries, where the low-lying areas are, and we bring that together with Landsat images and then zoom into areas that are appropriate in principle for rice cultivation. Of course in the second step we will do another analysis, look at distance to markets, road infrastructure, etcetera, to really pin down, zoom into areas that are really interesting to

develop further because these are very small systems, but extremely interesting to develop.

This is being done in Benin but just think about the potential of this methodology for a country like the Democratic Republic of the Congo, that is the size of Western Europe and that is full of these systems.

[SLIDE 23]

We also work on more extension agronomy work. Once you have these inland valleys, we want to work with farmer to develop them in a sustainable manner and make sure that we get good yields, and of course there we rely again on Asian expertise. More information can be found on this website. This project is funded by the Government of Japan.

[SLIDE 24]

One or two more examples, this is a machine that we imported last year from the Philippines. This machine comes from PhilRice with help from IRRI. It is a small combined harvester that we are testing in Mali and Senegal. Right now, rice systems in Mali and Senegal are either harvested by hand or they rely on huge combine-harvesters and this was already the case when I was there in the 90s. Harvesting by hand means that you are always late and if you are late you lose a lot of rice because rice will just shatter and the quality, the milling will also suffer. There are lots of constraints because of late harvesting.

These enormous combine-harvesters break down very often, people can't repair them and also they can't enter the field very quickly because they are too heavy. This small machine can just make the difference because it's quite light, it can harvest two hectares per day, and you have the product at the end of the day in the bag! That may also open possibilities for double cropping, because in principle these irrigated systems can be used twice a year at least if you would be careful with your sowing dates, because there are quite some problems with high and low temperatures in these regions as well. But if you work out your calendar properly, you can grow two crops.

[SLIDE 25]

I think this is the last example, work from our policy group that had a look at competitiveness of local rice production, data from 2011. I'm not an economist, but I'm told that if the domestic resource cost figures are below one, it looks good, so you can see that it looks good for competitiveness of rice production in Africa compared to imports.

[SLIDE 26]

The vision that we have is that we want to improve food security obviously. We are hopeful that Africa's rice production will increase by 21 million tons (that's paddy) – by 2020 and that will mean reaching –a rice self-sufficiency level of 80% by 2020. That's our vision.

That still means that Africa will import rice. If we make this happen, our predictions are that we still import 7 million tons, whereas right now we import 10 million tons, but at least we got rid of 3 million tons over the next 9, 10 years, and taking into account the tremendous growth needed to allow for consumption increase.

We believe that these research products, and this is very much based on the same methodology used at IRRI (these methodologies were developed hand-in-hand), that these research projects will lift four million people based in farming households, and eight million urban and rural rice consumers above the 1.25 poverty line. We are also hopeful that our products will reduce under-nutrition and that it will lead to more sustainable ways of growing rice.

Keep in mind that the average fertilizer consumption in Africa, if you take all crops and all systems together, is only 10 kilos per hectare per year, so we have a long way to go in terms of intensification.

Very important is capacity development. We want to have at least 30 Ph.D. and M.Sc. fellowships per year. One mechanism will be the GRiSP Scholarship System that we have. We also need to boost technical capacity, train technical people working in development projects and we want to move into season long training in rice production and rice processing, profiting from training centers established by JICA, and also including our own training center that we have in Senegal.

[SLIDE 27]

Our priority setting work shows that research will have the greatest impact in the lowland ecology in Africa, followed by the upland ecology, followed by the irrigated ecology and then the mangrove ecology.

This reflects that perhaps only 15% of rice grown in Africa is irrigated at the moment.

[SLIDE 28]

We can also look at country disaggregated results. The highest impact of research is expected in Nigeria, followed by Madagascar, and in general lowland comes at first position mainly in Western African countries.

[SLIDE 29]

A few words now about how we need to link with development initiatives.

[SLIDE 30]

We need to be able to package our research in ways that are easy to understand. This is a cropping calendar that was developed in Senegal depicting best-fit management options for a certain crop in a certain site, in a certain growing season, and these types of calendars are very easy to understand and good for farming discussions with farmers.

[SLIDE 31]

We've also developed a set of 11 videos on technical issues, from land preparation to weed management and soil fertility management. These videos have been shown on national TV in many countries.

[SLIDE 32]

More importantly, they have been translated in 33 local languages right now and used by our partner NGOs to show in African communities.

[SLIDE 33]

I have talked already about the nutrient manager tool that we are working on, that's currently being tested in Senegal, Mali, Ghana, and Nigeria, and it has great potential to make a difference, first in irrigated systems, enhancing rice productivity and fertilizer recovery rates.

[SLIDE 34]

We actively link with rice development projects across Africa. We have especially focused on seed production after the crisis in 2008. For example, this slide shows our work with UNDP to get rice seed in farmers' hands in Liberia, a country that comes out of civil war but is now getting back on its feet.

[SLIDE 35]

Also, the Japan-Africa Rice Emergency Seed Project was tremendously important to bring seed to vulnerable farmers in 20 countries.

[SLIDE 36]

I'm almost finished Mr. Chairman. I just want to look at this idea we have of setting up 'rice sector development hubs' one more time. We want to do 'proof of concept work' with a range of partners starting from the market right back to the farmer's field. We want to know what the market wants and then be able to produce sufficient quantities of that particular quality rice in a certain area by bringing together farmers, rice millers, and people that want to buy that rice instead of importing. These hubs are being put in place gradually and they are going to be fantastic testing grounds for technologies as well.

[SLIDE 37]

Some policy lessons from Senegal. If you work on value chain development, you need to think of three things. You want to add value obviously, so you need to work on quality enhancement, quality contracts, labeling, and branding of that quality. You need to make sure that you can deliver on that promise by shifting the supply by making sure that if somebody wants to buy that rice, he or she doesn't need to look for one bag here and one bag there, etcetera, but that you will have capacity to supply tons and tons and tons of that quality, and then of course you need to lift demand as well through smart marketing.

[SLIDE 38]

What does it mean then? For example, if you look at prices in Senegal for imported broken rice and locally

produced rice: we want to bring the price of locally produce rice to what people pay for imported rice. That means that you need to work on quality and you need to work on quantity and marketing, as I just said. But the funny thing is that that is not true for everybody. Only 80% of rice consumers in Dakar would like to have that better quality rice and are prepared to pay for it; the other 20% want to stick to the old type of rice that they will sift and clean themselves. Message again; know your market segment and your strategy should follow after that.

[SLIDE 39]

Conclusions

[SLIDE 40]

I hope that I convinced you that we need to boost Africa's rice sector to feed Africa and to avoid another rice crisis, because we are looking at a very thin world market and consumption levels in Africa that go through the roof. There are excellent opportunities, there is water, there is land, and there are people that are keen to work. We need to reinforce and leverage NARS capacity, because the situation is truly disastrous. We have to enhance science capacity at the national level because Africa is just too large to think that Japanese, IRRI, and AfricaRice researchers can do it on their own.

We need to capture global synergies through GRiSP obviously. And establish these rice sector development hubs, to do 'proof of concept' work, producing good quality rice in sufficient quantities for the African market.

By doing so we will contribute to reducing the African rice import bill of about US \$6 billion annually, and ensure that this huge amount of money can be spent on boosting the African economy instead. Last but not least, we need to work hand in hand with country and regional initiatives and in particular with the Coalition for African Rice Development.

[SLIDE 41]

With that ladies and gentlemen, I would like to thank you for your attention and the people of Japan for their tremendous support for rice research and development in Africa.

Thank you very much.