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New technique boosting rice production in Mwea

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Experts work on developing new rice varieties in one of the rice labs at Kalro in Mwea. Dr Daigo Makihara the lead researcher in the programme notes that efforts are underway to develop varieties that are robust, resilient, and adaptable for wide-ranging ecological settings.

Paddies on either side of the road stretch as far as the eye can see as you enter Mwea Constituency in Kirinyaga County.

Rice is the primary source of livelihood in the region with the Basmati 370 being the most widely cultivated variety.

For a long time, 40-year-old John Gakuya Nyamu, one of the farmers at the 22,000-acre Mwea Irrigation Scheme has exclusively depended on the crop.

The farming engagement provided just enough to ensure his family is well-provided for with no additional profits.

“From the two leased paddies that I farm, I used to get about 20 bags of rice. While it was enough to cater for my family, I did not realise I could earn much more,” says Nyamu.

Luckily for Nyamu and other farmers, things have changed for the better.

Today innovative technologies have been introduced that have seen an increase in rice production and a drop in production costs.

This has been made possible through a collaboration between the Ministry of Agriculture, Livestock and Fisheries and Japan International Cooperation Agency (Jica), which brought in stakeholders like Mwea Irrigation Agricultural Development (MIAD), the Kenya Agricultural and Livestock Research Organisation (Kalro), Japan Science and Technology Agency (JST), National Irrigation Board (NIB) and several universities both in Kenya and in Japan, among other backers.

Through the partnership’s programme, Science and Technology Research for Sustainable Development (SATREPS) project, key constraints that hinder effective cultivation of rice in the country were identified and efforts to alleviate them effected.

“Cold weather, rice blast disease, drought and water saving inadequacies, and low fertility and soil salinity were identified as factors that have been constraining the crop’s effective cultivation in various regions countrywide,” says Dr Daigo Makihara the lead researcher in the programme and associate professor at the International Cooperation Centre for Agricultural Education at Nagoya University in Japan.

He notes that efforts are underway to curb these challenges by developing rice varieties that are robust and resilient, and adaptable for wide-ranging ecological settings.

He said this is possible through advancement of technological innovations and resourceful yet sustainable ways to cultivate the crop

## FIVE PRINCIPLES

Dr Makihara says technologies such as molecular breeding of rice and DNA-marker assisted selection are currently applied in the programme at Kalro in Mwea to come up

with rice varieties that carry suitable genes to overcome stress conditions in different geographical and ecological settings in the country.

And in reiteration of the importance of rice as a top food security crop and encouraging its cultivation, Dr John Kimani the managing director of Kalro-Mwea says up to 16 new rice varieties have so far been developed for varied environments in the country; for both uplands and irrigated conditions.

But water has proven to be the most serious challenge for farmers at the scheme.

Jica's Rice-based and Market-oriented Agriculture Promotion Project (RiceMAPP) has strove to alleviate these challenges through its innovative concepts.

"For a long time, there have been water related conflicts in the scheme but the situation is now better," says David Njogu, a former RiceMAPP project manager at Mwea. His view was echoed by John Ndegwa, a rice farmer in the scheme.

Ndegwa says his production has now increased hence his profits and savings have improved. He says conflicts with other farmers have gone down and expenses involved in the crop's production have decreased.

"Through the water saving rice culture, I now harvest up to 30, 100-kilo bags from one paddy from my initial 13 to 19 bags, while my water usage has gone down too," he says.

The RiceMAPP project involves use of rice production knowledge and technologies to promote income sustainability of the farmers and water management in rice farming is one of its key components.

"By following the five principles of RiceMAPP's water saving rice culture and using improved, certified and recommended seeds, higher production even from a single paddy is guaranteed," says Wilson Oyange, RiceMAPP's current project manager at MIAD. He says through it, a farmer can earn up to Sh400,000 in six months from one paddy.

This involves hand levelling of the paddy resulting in successful transplanting and easy water management and using healthy seedlings which should be pre-germinated by soaking in water for 24 hours then incubated for 48 hours to attain higher and even germination rate.

#### INCREASE ACREAGE

Line planting is the third principle with the recommended spacing of 30cm by 15cm rather than randomly planting the rice seedlings.

This is followed by improved weeding using a push-pull weeder which is more effective and requires less manpower compared to manual weeding and intermittent irrigation which involves supplying only the required amount of water whenever it is required and not flooding the paddy.

“Intermittent irrigation involves alternately flooding the paddy for three days and leaving it unflooded for three days, each 10 days, repeatedly for 30 to 45 days until the rice starts to flower. This facilitates oxygen absorption into the soil as well as saving water,” says Vincent Koskei, NIB’s research officer at the Wang’uru Station.

Koskei says adhering to these principles as well as proper crop management practices and using the right nutrients such as potassium-based fertilisers will boost a farmer’s chances of attaining maximum rice production, and earning profits even from the second rice crop that is allowed to grow after harvesting the main crop, commonly called rice ratoon crop.

He adds that use of machinery in harvesting and processing the crop is equally important rather than the manual harvesting as it averts loss and wastage of the harvest, saying using paddy reapers and threshers, and combine harvesters ensures effective rice harvesting.

“Challenges such as weeds like *echinochloa crus-galli*, sages and nylon grass, the highly destructive rice blast disease, water shortage and migratory birds, among others, have always been obstacles affecting rice production,” he notes.

But the NIB and its partners have put measures in place to ease these challenges with the anticipated construction of the Thiba Dam set to fully end the water shortage

situation at Mwea and boost its production as well as increasing the acreage of the scheme to accommodate more farmers.

Engineer Yunoki Yuji, the project's consultant says on completion of the dam, the scheme's rice production is expected to double from the current 60,000 tonnes to 120,000 tonnes and accommodate even more farmers.