

“Leveraging Science, Technology, and Innovation to Build More Resilient Food Systems: the case of the Juncao Technology”

By Dr. Patrick KARANGWA, Director General of Rwanda Agriculture and Animal Resources Development Board (RAB), on behalf of Dr. Geraldine MUKESHIMANA, Hon. Minister of Agriculture and Animal Resources of the Republic of Rwanda.

Distinguished Participants, Ladies and Gentlemen.

It is my honor and pleasure to participate in this side even on **“Leveraging Science, Technology, and Innovation to Build More Resilient Food Systems: the case of the Juncao Technology”** representing Hon. Minister of Agriculture and Animal Resources of the Government of Rwanda who delegated me to attend the event on her behalf due to concurrent commitments.

Agriculture is the major pillar of the Rwandan economy, contributing a third of the GDP. The sector employs 62.2% of the labor force, contributes 63% of foreign exchange earnings and meets about 90% of the country’s food needs.

Rwanda is the most densely populated country in mainland Africa, with 525 inhabitants per square meter and 0.3 ha farm size per household. Studies have projected that the country’s agriculture sector needs to multiply by 15 times current levels of productivity to ensure meeting food security needs of the rapidly growing population by 2050.

Considering the country’s challenges of the agriculture sector, the Government of Rwanda promotes technologies and innovations that allow achieving high levels of productivity on small land and promotion of high value crops. In this regard, the Government of Rwanda considers the Juncao technology, a

technology based on growing mushrooms by using low-cost and locally materials (grasses), one of the innovations to be prioritized.

Invented in the 1980s, by professor Lin Zhanxi from China's Fujian Agriculture and Forestry University and rapidly disseminate globally, Juncao technology is a powerful technology for developing countries in the process of the eradication of poverty, reduction of hunger, use of renewable energy, promotion of employment and response to climate change. The Juncao technology is among high potential agricultural technologies to enable achievement of the Sustainable Development Goals (SDGs), Comprehensive Africa Agriculture Development Program (CAADP), and EAC's Agenda for Agriculture.

Among the Sustainable Development Goals (SDGs), the agriculture sector plays a key role to achieve several SDGs, particularly: SDG 1 (end extreme poverty), SDG 2 (zero hunger, improved nutrition, and sustainable agriculture), SDG 8 (decent work and economic growth), SDG 13 (climate action) and SDG 15 (terrestrial ecosystems, forests, and land). By highly increasing productivity of agriculture on a small land, the Juncao technology enables to achieve the graduation from poverty and fight malnutrition.

The Comprehensive Africa Agriculture Development Programme (CAADP) was born with the aim to drive agriculture transformation on the African continent by raising agricultural productivity by at least 6 per cent through increasing public spending on agriculture to at least 10% of national budgets. The Juncao technology is among the high value technologies to enable Africa to rapidly deliver on CAADP by efficiency of agriculture investments and public spending. Rwanda has emerged the best-performing country overall in implementing CAADP, the continental policy framework for agricultural transformation, wealth creation, food security and nutrition, economic growth and prosperity for all.

Ladies and Gentlemen,

During the China-Africa Cooperation Forum summit held in Beijing in 2006, China agreed to adopt for reinforced economic aid to Africa by creating the Agriculture Technology Demonstration Centers. The China-Rwanda Agriculture Technology Demonstration Center (C-RATDC) is one of 14 centers established in Africa. It has a mission of developing market-oriented agriculture and land husbandry through research, extension, technologies demonstration and trainings. It is also committed to be an economically viable, cohesive and sustainable diversified demonstration Center, that uses highly good agricultural practices to produce high quality cultivated rice, mushrooms, grass for feed and silkworm hybrid eggs to improve farmers' livelihoods and food security in Rwanda.

According to the agreement signed between China and Rwanda, this C-RATDC has four areas of (1) JUNCAO (mushroom) technology, (2) Rice cultivation, (3) Sericulture, and (4) soil and water conservation. Through this agreement, twelve experts whose main job was to fulfill duties related to (1) technical training, (2) demonstration, (3) extension and other related works, have been sent to Rwanda by Fujian Agriculture and Forestry University

The adoption of Juncao technology in Rwanda consisted of (1) Research and demonstration activities, (2) Introduction and adaptation of suitable JUNCAO grass varieties, (3) Trainings and extension activities, and (4) Post-harvest management

Different demonstration models on mushroom cultivation including triangle mushroom shed, flat-topped mushroom shed, grass ecological mushroom shed, mushroom indoor cultivation, and mulberry cultivation were adopted. Twelve mushroom varieties were introduced and their adaptability was evaluated. Research has been done on different mushroom substrate formulations based on Nitrogen and Carbon substrate formulation using Elephant grass, Rice bran, Maize cobs, Maize straw, Sorghum straw, Cotton seed shell, Rice husks, Lime powder, and water. The best formulation was developed and is currently used by

more than 50 mushroom seed producers, companies and cooperatives. The preliminary research on local wild edible and medicinal mushroom resources was conducted.

Four grass varieties were introduced from China and are currently used in production of mushroom substrates. These include *Giant grass*, which can get the yield of 450 tons/hectare and can produce 150 tons of fresh mushrooms.

To date, 46 training courses on JUNCAO mushroom cultivation technology were organized, and about 35,000 mushroom farmers have been trained. The beneficiaries include farmers, women's associations, cooperatives, youth, orphans, AIDS organizations, Universities, vocational and technical colleges, hospitals, juvenile prison and so on. In November, 2019, the Ministry of Commerce of China has sponsored a Training Course on JUNCAO technology, organized by Fujian Agriculture and Forestry University in collaboration with Rwanda Agriculture and Animal Resources Development Board (RAB). Forty-five participants, including university lecturers, RAB Staffs, Sector Agronomists, cooperative members, young entrepreneurs, and privates attended this 25 days' course.

In order to preserve mushroom yield, technologies such as Mushroom preservation in salt, mushroom grinding to get powder, mushroom drying, fried mushroom, mushroom packaging, cooking and other processing technology are evaluated at the Rwanda – China technology Demonstration Center.

Before the introduction of Juncao technology, many people in Rwanda were not aware that mushroom farming is a profitable business that can help fight poverty. Now the Juncao business helps producers pay school fees for their children and meet other household needs. Juncao technology has contributed to job creation, food security and generating income for rural communities in Rwanda and has played an important role in tackling malnutrition in the country. To date, stakeholders involved in mushroom production are estimated

at 15,000 farmers. Most of them are youth and women. The mushrooms grown in Rwanda are exported across the region, and contribute to improving the health and livelihoods of tens of thousands of farmers and customers.

Ladies and Gentlemen,

The Government of Rwanda will keep up efforts to develop and adopt technologies and innovations for achieving agriculture transformation and improvement of farmers' livelihoods, and highly appreciate cooperation in this regard. We highly appreciate our cooperation with the Government of China and other development partners in pursuit of transformational growth of economy.

We consider that in order to maximize benefits of Juncao technology, it is necessary to (1) integrate mushrooms cultivation into the overall development programs and economic strengthening activities, (2) provide continued support to the mushroom stakeholders through technical advice and monitoring, and put in place processing and storing mechanisms for fresh mushroom to reduce the mushroom production losses uncounted by farmers, and (3) Encourage more private investors to invest in mushroom industry.

Under H.E President Paul KAGAME leadership, Rwanda has become a reference point for good governance in the region, political stability with well-functioning institutions, observance of the rule of law and zero tolerance for corruption. Rwanda today prides itself in being among the easiest, safest and cleanest places to do business and travel to in the world.

I thank you for your kind attention.