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**Post-harvest mango activities, organic mango production, mechanization, and using renewable energy**

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Notes to broadcaster

Mangoes were introduced to Mali at the beginning of the 20th century. Mango farming has now been developing for years in the south of the country, in Sikasso and Koulikoro, regions with high agricultural potential. Mango is grown during the rainy season.

The post-harvest process for mango includes activities that can be classified into two categories: technical activities such as harvesting, sorting, washing, packaging/storage, and processing, and economic activities and issues such as transportation, marketing, quality control, nutrition, and extension.

For this radio script, three people were interviewed, including the expert Oumar Assarki, technical advisor for the mango value chain at the GIZ-led Green Innovation Center; Keletigui Berthe, mango producer and Chairman of the Local Union of Mango Producers' Associations of Sikasso; and Halassane Kone, a second producer in the Sikasso region.

The expert and the farmers speak about the challenges they face in post-harvest mango activities, and the solutions to those challenges.

This script could serve as inspiration for a program on post-harvest mango activities on your station. If you decide to use it in your farming program, you could use voice actors or colleagues to represent the actual people interviewed for the script. If so, please inform your audience at the beginning of the program that these are the voices of voice actors and colleagues, and not those of the actual interviewees.

If you want to produce programs on post-harvest activities in mango, talk to mango farmers, experts, and other stakeholders in the agricultural value chain.

You could ask them the following questions, for example:

* What are the difficulties encountered in post-harvest activities?
* How can these difficulties be solved?

Estimated duration of the radio script with music, intro and extro: 20 minutes

**SFX:** SIGNATURE TUNE

**HOST:** Hello everyone, today we are going to talk about a very lucrative and important sector of the Malian economy, namely the mango sector.

 Our expert Oumar Assarki and two mango farmers are going to enlighten us about the sector and all its post-harvest activities.

 We will talk about the challenges related to post-harvest mango activities and how farmers can solve their problems.

 Mr. Assarki, what are the difficulties encountered and solutions available related to the mango harvest?

**OUMAR ASSARKI:** The following are the main difficulties encountered by producers: poorly trained mango pickers, lack of harvesting tools such as harvesting baskets, problems related to seasonal credit, and shocks caused by climate change, the COVID-19 pandemic, and security crises.

The solutions to these problems include providing access to financing, equipment, and inputs, and providing support and locally available advice for actors in the mango value chain. This could include digital advice, and advice provided through social networks and radio.

 Other solutions include promoting organic farming and agro-ecology, facilitating access to mechanization and renewable energy, and supporting those involved in the mango value chain to protect themselves against COVID-19.

**HOST:** What are the post-harvest difficulties encountered in the mango sector?

**OUMAR ASSARKI:** The difficulties encountered include the low capacity to install infrastructure such as cold rooms or factories, and the high cost of inputs, especially packaging.

 These are compounded by the high cost of certification, the country's lack of access to the sea, and the high cost of transportation.

Other difficulties include the poor access to and high cost of processing equipment and materials to create employment and added value, and lack of access to seasonal credit.

**HOST:** How are mangoes stored and processed?

**OUMAR ASSARKI:** In Mali, we have public packaging centres, particularly in Sikasso and Bamako, which are collective centres. There are also private packaging centres, 36 fresh mango export companies, 60 mango processing companies, and two large factories, COMAFRUIT and CEDIAM.

 Mango products are stored in the packing centers and processing companies.

**HOST:** What solutions do you propose to remedy the problems associated with the storage and processing of mangoes?

**OUMAR ASSARKI:** To remedy problems related to packaging and certification of mangoes, there is a need to set up packaging infrastructure.

 Also, it’s important to help export and processing companies to access seasonal credit, inputs, equipment, and materials.

 Finally, we need to implement measures to adapt to climate change and strengthen business’ management skills.

**HOST:** What are the effects of climate change on the mango harvest?

**OUMAR ASSARKI:** Climate change has many impacts. The mangoes fall before ripening, which is a huge loss in income for producers, dealers, and marketing and processing businesses. Other impacts include water and wind erosion, which lead to loss of soil fertility, and torrential rains and extreme temperatures, which cause a big loss in mango productivity, resulting in a loss of income and employment at all levels of the value chain.

**HOST:** What can producers do to address the effects of climate change?

**OUMAR ASSARKI:** Producers currently use traditional methods to adapt to changes in their environment. It is recommended that they adopt the following practices: collect surface water, adopt measures to control erosion and protect soil and water, practice agro-ecology and sustainable land management, install living hedges, collaborate with meteorological services, and use agroforestry practices, including reforestation.

**HOST:** Can you tell us about organic farming, mechanization, and using renewable energy in the mango sector?

**OUMAR ASSARKI:** Mechanization is important for businesses such as packaging centres that use very expensive automatic grading machines. Also, processing and transportation equipment can increase the volume of mango products heading for markets.

Expanding organic farming can help improve food security among poor families in rural areas.

Also, technologies that are adapted to local needs and powered by renewable energy can be introduced: for example, using mango waste to make butane gas. Mango waste can also be placed in an environment without oxygen. This promotes the development of microorganisms that transform the waste into biogas after three days. But these technological innovations must be within the reach of small-scale mango producers.

**SFX:** TRANSITION MUSIC

**HOST:** After interviewing Oumar Assarki, we turned to Keletigui Berthe, chairman of the mango producers' association in the area, and then we turned the producer from Sikasso to talk about mango-related activities.

 Keletigui Berthe, what are the difficulties you encounter during the harvest and what solutions do you propose?

**KELETIGUI BERTHE:** With regard to harvesting, we need to strengthen the capacity of pickers in their work. Pickers are not trained in techniques such as identifying mangoes to be harvested, and not educated on the rate of ripening and sugar content of mangoes. Also, we do not have crates to put the mangoes in. We lack funding to recruit more pickers.

 To remedy this, we need to train pickers in harvesting techniques, buy more mango harvesting crates, and seek funding to recruit more pickers. All this cannot be done without the support of the Malian government and financial partners.

**HOST:** What difficulties do you encounter during sorting and washing mangoes and what solutions do you propose?

**KELETIGUI BERTHE:** We need to train people in sorting and washing and in traceability so that consumers know where the mangoes come from. There is a shortage of cold rooms to store the mangoes. The solution is to build cold rooms and to train people on the skills needed to do the job. This involves training people in sorting techniques and identifying mangoes to be selected for processing and marketing.

**HOST:** What difficulties do you encounter during processing and what solutions do you propose?

**KELETIGUI BERTHE:** Of course we have difficulties during processing. We lack modern processing equipment, which is why Mali is at the bottom of the list of countries in the sub-region in terms of mango processing. In short, we do not have suitable processing plants.

**HOST:** What difficulties do you encounter in transporting mangoes and what solutions do you propose?

**KELETIGUI BERTHE:** We do not have appropriate trucks for transportation. We need refrigerated trucks for export. The State and its partners must help us acquire refrigerated trucks.

**HOST:** Do you have any difficulties with quality control of mangoes?

**KELETIGUI BERTHE:** We have difficulties, but we have started training phytosanitary agents on how to choose the right quality mangoes.

**HOST:** Why didn't we get enough mangoes this year?

**KELETIGUI BERTHE:** This is due to climate change, and more specifically the change in the timing of the rainy season and the increase in heat. This also affects nearby countries such as Burkina Faso and Côte d'Ivoire.

**HOST:** Will the lack of mangoes this year have a negative impact on the marketing of mangoes?

**KELETIGUI BERTHE:** It will have a serious impact on the marketing of Malian mangoes, because this year we did not export mangoes as planned.

**HOST:** What are the post-harvest difficulties encountered in the mango sector?

**KELETIGUI BERTHE:** The difficulties that we encounter in marketing mangoes relate to the problem of certification, because in Mali we do not have a certifier. All the certifiers come from other African countries to certify Malian mangoes. There is also the problem of quality, as most of the mangoes are stung by flies or other insects before they are picked. This creates a lot of problems for us because we can no longer export them, so it is a loss for us.

We have to find other countries, besides France and Holland, which are less demanding. We are working to find other countries to which we will export mangoes.

 One post-harvest challenge is that we do not have qualified people to do the harvesting, so we need to train these people in harvesting techniques. Also, we do not have sufficient cold rooms to store the mango crates, nor do we have enough crates to store the mangoes.

 When it comes to sorting, we need to train people to identify the mangoes for washing because there are mangoes damaged by insects that are not sold, and which should be put aside. Finally, when it comes to processing, we need a factory.

**HOST:** How did you address difficulties with marketing mangoes?

**KELETIGUI BERTHE:** We are trying to acquire training in marketing to be able to do a good job. Regarding certification, we are asking the State to train Malians in certification so that we will not need to ask people from other countries to certify our mangoes. As for flies, the government should help us by providing products to control them.

**HOST:** What do you need to do to solve these difficulties?

**KELETIGUI BERTHE:**  We are requesting the State to buy us cold rooms because the old cold rooms are not in working condition. The State must assist producers during the entire post-harvest process. We need finances for all these post-harvest phases, including storing mangoes and marketing. The only way to solve this problem is for the government to help producers financially and to provide them with phytosanitary products to control the mango fruit fly. The State must help producers to be autonomous.

**SFX:** TRANSITIONAL MUSIC

**HOST:** After the interview with Keletigui Berthe, we interview Halassane Kone, a mango producer in Sikasso.

What activities do you do after the harvest?

**Halassane KONE:** After the harvest, I do market gardening so that I have something to eat and some money for my small needs.

**HOST:**  What are the difficulties you encounter during mango activities?

**HALASSANE KONE:** Water and fruit flies are the problems we encounter.

**HOST:**  What should be done to fight against fruit flies?

**HALASSANE KONE:** We monitor the fly populations in the orchards by setting traps, and then we prepare to use a control product based on the number of flies caught per day. There are a number of products that can be used to control fruit flies.

 In Mali, the fact that there are no certifiers is another difficulty for mango exports. It is expensive to hire a certifier, but without one we cannot export mangoes, so it is a loss for us.

 The other difficulty is access to fly control products, because to treat one hectare, you need 50,000 CFA francs ($90 US) and banks are not prepared to finance this. Flies create a marketing problem because if mangoes are bitten by flies, we cannot export them.

**HOST:** What are you doing to solve these difficulties?

**HALASSANE KONE:** With regard to water, I am saving money to dig a well in my garden, and with regard to flies, I have found a product that can kill them. As for the difficulties of export, I am asking the State of Mali to help us. Also, to help farmers obtain credit to buy products to control fruit flies, banks should recruit people who understand the agricultural sector and who can guide them.

**HOST:** As you heard during these discussions, listeners, we talked about the mango sector and post-harvest activities, including the difficulties that producers face during processing, drying, storage, and marketing. We also talked about the solutions to these problems such as training producers, facilitating access to equipment such as cold rooms, processing plants, and the financial contribution that the State must provide.

On that note, thank you to everyone and goodbye.

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Keletigui Berthe, Producer and Chairman of the Mango Producers of Sikasso

Halassane Kone, Producer in Sikasso

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