SUBJECT: Fieldwork on Learning Innovations in Urban Agriculture and Water Saving Techniques, for 10th Feb. 2023

INTRODUCTION

Practical Agri Business Learning Innovation Centre (PABLIC)

On the 10th of February 2023, a group of AIAP members went for a Fieldwork at Jomo Kenyatta University of Agriculture and Technology to learn on innovations in urban agriculture and water saving techniques. Our host was Prof. Wesonga, JKUAT- Horticulture Department.

Trip Objective

Objectives of the field visit was to gain practical skills in agriculture that address societal challenges that include but not limited to:

a) Unemployment
b) Climate change
c) Food and nutrition insecurities

JKUAT Farm (Block A)

Mainly the farming activities and technologies on the model farm are run by the undergraduate students within the department of Horticulture who have an association named Horticultural Students Association (HOSA) that enable them to run the innovative farm activities smoothly. The skills gained from the practical engagement has not only exposed the students but also prepare them to transit into the job market or self-employ themselves by putting the skills learnt into use.

Some of the young graduates who have benefited from the HOSA entrepreneurial activities include the following:

i. JK smart farm
ii. Zion Green
iii. Thuku Farm Services Limited
iv. Urban Smart Gardeners
v. The Son green Empire
vi. KKMG Agriprenuers SACCO – based in western Kenya

Farm Observations

The farm had variety of greenhouses (both local and Japanese designs) that grew crops like Strawberries, tomatoes, sweet potatoes, cow peas, dragon fruit, nippier grass etc. Outside the green houses, some spinach, lettuce, cabbages, kales and cowpeas were seen. The local green house was vented and was noted to produce better yield in the last trial season as compared to the Japanese green house. It was also noted that readily available materials were used in all the designs of the

water saving technologies and innovations. Crop rotation would be practiced even in the green houses.

Both self-wicking bed system and capillary wick system inside and outside the green houses as a water saving technique. There was also use submersible pumps connected to an automated power system that irrigates the greenhouses 3 times a day for 3 mins through drip irrigation.

They also have an underground silo where fertilizer is mixed and is connected to the water pumps. Fertigation is continuous but for 1 minute. Fertilizers used include but are not limited;

i) Green life fertilizer
ii) Yara fertilizer
iii) Amiran fertilizer

Notes on Innovations and Activities

1. *Self-wicking beds and capillary wick system*

These are water saving techniques that require use of capillary mat system to help propagate water usage and labour costs. Styrofoam boxes, containers or soil blocs are mostly used for these techniques. The system requires no pumping or very minimal use of energy. The capillary mat is usually polyester to enable easy absorption of water. The system has 2 chambers; i) Top chamber for plants i.e. strawberries or tomatoes, ii) bottom chamber for the capillary wick.

2. *Single node sweet potato seedlings*

Here, a sweet potato cutting that has leaf nodes is planted in some trays that have wick mats under. As the plant grows, roots develop from every leaf node of the cuttings made. It takes 3-4 weeks before the seedlings can be transferred to the main farm.

3. *Dragon Fruit*

These are highly valued crops that are also highly nutritious. They easily adapt to dry conditions and are therefore ideal for production under the changing climate.

4. *Microgreens*

Microgreens are young plants harvested for consumption when they just form the first true leaves usually within a period of 14 days. They are highly considered to be rich in nutrients and other compounds. They are therefore considered beneficial in dealing with a variety of lifestyle diseases. Here, seedlings such as sunflower and radish are spread in soil filled containers. Another container filled with sand is placed on top of the self-wick container with seedlings for a period of 3 days before being removed. This enables the roots of the plants to grow downwards towards the water source. This method does not work well for some plants like chia seeds since they stick at the bottom of the container above. The self-wicking container with plants is then place in a dark cabinet for a period of 7 days before being placed in sunlight. In supermarkets, 100g of radish goes for kes300.