



MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES

STANDARD OPERATING PROCEDURES FOR SCHOOL DEMONSTRATION GARDENS



SEPTEMBER, 2019

Strengthening Agriculture, Education and Nutrition Linkages

FOREWORD

Despite all the previous interventions by the country in key sectors such as Agriculture and health, malnutrition still remains one of the serious health and economic problems facing Uganda and Sub-Sahara Africa generally. This was re-affirmed in the 2019/20 budget speech where malnutrition along with high poverty levels and unemployment was identified as one of the three key challenges facing the country's sustainable development. Furthermore, the 2019/20 budget speech called on the Ministries responsible for health, agriculture, education and gender to step up key coordinated actions and sustainably improve the nutrition situation in Uganda. Key among the recommended actions was the setting up of vegetable gardens in all schools in the country to provide practical nutrition education and training for school going children and the youth.

To ensure consumption of adequate and diversified nutritious foods, the process starts with agriculture production and its recommended practices necessary to increase food production for improved household food and nutrition security. In addition, Nutrition education provides a basis for enhancing communities' knowledge and awareness on good nutrition hence creating demand for production and consumption of diversified nutritious foods. However, without adequate regular household income flows, this demand for diversified, nutritious food is not sustainable. Other actions for improved nutrition include all those under the health sector that ensure good health and wellbeing of the population.

Clearly therefore, the process for ensuring household food and nutrition security calls for a multisectoral approach. In this connection, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) as a lead sector along with the Ministries of Health (MoH), Education and Sports (MoES), Local Government (MoLG) and District Local Governments are implementing a five-year Uganda Multi-Sectoral Food Security and Nutrition Project (UMFSNP). The Project Development Objective is to increase production and consumption of micronutrient-rich foods and utilization of community based nutrition services in smallholder households in project areas using universal primary education (UPE) schools as a key entry point to the community. Every school is supported to establish and maintain a nutrition sensitive school demonstration garden. Priority nutritious crops promoted by the project include; Iron Rich Beans (IRB), Orange Fleshed Sweet Potatoes (OFSP), and micronutrient rich fruits and vegetables.

The purpose of this Standard Operating Procedure (SOP) is to provide a national tool to guide all schools in establishing and maintaining school demonstration gardens. The information in the SOP along with accompanying literature that has been developed to support its use will facilitate the setting up of standard nutrition sensitive school

gardens countrywide. This will promote practical learning to the school-going children, demonstrate different technologies of growing micronutrient rich crops and demonstrate to school going children and communities surrounding schools how to have year round production of diverse food products for improved household nutrition and healthy living. These school demonstration gardens if well utilized will go a long way in creating youth champions for agriculture, food and nutrition security.

I appeal to all agricultural extension officers, teachers and community development workers to make good use of this SOP and its accompanying literature that has been developed to support its use. This will greatly assist in strengthening the linkages between agriculture, education and nutrition.

For God and My Country



Hon. Vincent Bamulangaki Ssempijja (MP)
Minister of Agriculture, Animal Industry and Fisheries

ACKNOWLEDGMENT

The Ministries of Agriculture, Animal Industry and Fisheries and of Education and Sports would like to acknowledge the efforts of a number of organizations and dedicated individuals who contributed immensely to the production of this standard operating procedure (SOP) for school demonstration gardens.

We are grateful to the Global Agricultural Food Security Programme (GAFSP) for providing funding for this project and the World Bank for their supervisory role. Particularly, we would like to thank the staff from the National Agricultural Research Organization Headquarters, National Agricultural Research Laboratories-Kawanda, National Crops Resources Research Institute-Namulonge for their time and input into this SOP.

Finally, we would like to thank Officers from the implementing Ministries of Agriculture, Animal Industry and Fisheries, Education and Sports; Health and Local Government who worked tirelessly to develop the first Standard Operating Procedures (SOPs) for school demonstration gardens in Uganda. We are confident these SOPs will greatly assist in strengthening the linkages between agriculture and education sectors and more importantly improve the nutrition status of the population. The team was led by Mr Alex Bambona (the Task Manager and Project Focal Point-MAAIF), Mrs Susan Oketcho (Project Focal Point-MoES), Mrs Sarah Ngalombi (Project Focal Point-MoH) and Mr. Andrew Musoke (Project Focal Point, MoIG). Your input made this document what it is today.



Pius Wakabi Kasajja

PERMANENT SECRETARY, MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES



Alex Kakooza

PERMANENT SECRETARY, MINISTRY OF EDUCATION AND SPORTS

Table of Contents

FOREWORD	i
ACKNOWLEDGMENT	iii
Table of Contents.....	iv
Section A: Introduction	1
Section B: Overview of the School Demonstration Garden	1
Section C: Purpose of School Demonstration Garden	2
Section D: Stakeholders Involved	3
Section E: School Garden Size	5
Section F: Site Selection and Location.....	6
Section G: Seed Selection, Storage and Planting	6
Section H: Land Preparation	6
Section I: Planting	7
Section J: Fruit Trees	7
Section K: Fencing.....	7
Section L: Labeling Requirements	8
Section M: Safe Use, Handling and Proper Disposal of Agrochemicals (Pesticides, herbicides and fertilizers).....	8
Section N: Harvesting	11
Section O: Post-harvest handling of produce.....	12
Section P: Utilization of Produce	12
Section Q: Record Keeping	13
Section R: Sustainability	13
Section S: Demonstration Garden Tools Required	14
Annex 1: Peri-Urban and Urban Vegetable Production Technologies	15

Section A: Introduction

The purpose of this SOP is to guide schools set up standard school gardens based on good agricultural practices and scientific principles. For practical purposes, the SOP content has been given in summary and will be used along with relevant accompanying literature that has been specifically developed or adopted to facilitate the setting up of school gardens initiated under the Uganda Multi-sectoral Food Security and Nutrition Project. This is the first edition of the Standard Operating Procedures (SOPs) for school demonstration gardens in Uganda. The SOPs have been deliberately designed to transfer nutrition sensitive agriculture technologies and will potentially assist in achieving the following outcomes / impacts:

- 1) improving practical agricultural training for school going children in Uganda,
- 2) contributing to creating agriculture, food security and nutrition youth champions/leaders,
- 3) contributing to improving school feeding, nutrition and health of school going children (when the demo foods are harvested & utilized at the school or from school farms that have adopted the nutrition sensitive technologies or through the community purchases that have adopted the technologies),
- 4) improving community nutrition through the technologies adopted,
- 5) strengthening the community and school interactions (as they take part in setting up and learning from the school demonstration garden) and
- 6) ultimately strengthening the agriculture, education and nutrition linkages.

Section B: Overview of the School Demonstration Garden

A School demonstration garden will be a cultivated unit of land around or near to a school, owned by the school, tended to at least partly by learners, used as a practical tool to facilitate integrated learning and demonstrate unique agricultural skills to learners for the production of nutritious food. In Uganda, the need to promote school demonstration gardening is a policy issue as highlighted in the 2013 national school feeding guidelines.

The school demonstration garden will be set up following the Uganda guidelines on school feeding and nutrition interventions program that outlines the essence of promoting school demonstration gardens as summarized below;

1. School demonstration gardens will be used as educational tools

2. Involvement of school going children in food production and agricultural activities must be encouraged as an integrated part of learning, without exploitation of the students, and with due regard to international conventions relating to child labour
3. Schools are encouraged to fully utilize available school land by establishing demonstration gardens where vegetables, fruits, and other nutritious and early maturing crops can be grown
4. No child/pupil shall be involved in any agricultural activities for any form of discipline or punishment
5. Where space permits schools are encouraged to maintain woodlots that can serve as shade, windbreaks, wood fuel, or as a means of conserving environment
6. Where land for gardening is not available, schools are encouraged to utilize hanging gardens, boxes or pots for growing fruits and vegetables that do not take up much space, e.g. Mushrooms, onions, etc.
7. Schools shall put safety measures in place during school demonstration gardening giving due attention to age, sex and health

Section C: Purpose of School Demonstration Garden

1. Promote practical learning by school going children on good agronomic practices of micronutrient rich crops.
2. Demonstrate different technologies of growing micronutrient rich crops.
3. Demonstrate to school going children and communities how to improve a diet with home-grown foods.
4. Promote linkage between demonstration gardens and good nutrition practices.
5. Utilize demonstration gardens to strengthen learners' skills in planning, food production, post-harvest handling, value addition and consumption of balanced diets.
6. Increase school going children preference for and consumption of vegetables and fruits.
7. Promote, or re-establish, horticultural and home economics skills in Uganda's agriculture-dependent economies.
8. Foster entrepreneurial skills in the area of market gardening.
9. Raise awareness of the need for environmental protection and soil conservation.

Section D: Stakeholders Involved

Establishing and sustaining a school demonstration garden requires concerted effort from a number of stakeholders.

Stakeholder	Role
Head teacher	<ul style="list-style-type: none"> Provides overall leadership in demonstration garden management Appropriates resources for demonstration garden management Secures land for the school demonstration garden Ensures active participation by all staff and learners Accountable for all aspects of the school demonstration garden Linking the demonstration garden to the community to enhance adoption Take lead in ensuring sustainability of the school demonstration garden. Ensure that the school has a functional Nutrition Committee
School Nutrition committee	<ul style="list-style-type: none"> Responsible for overall planning, management and supervision of the school demonstration garden including utilization of produce Guides the school on priority technologies to adopt and utilize in the school demonstration garden. Supervises and guide the procurement of inputs for the demonstration garden
Learners	<ul style="list-style-type: none"> Actively participate in practical learning Together with the teacher, participate in tending for the demonstration garden including establishing and management of the nursery bed.) Draw lessons from the school demonstration garden and utilize them at household/community level Share knowledge and technologies with parents
Teacher responsible for the school garden/Science teacher	<ul style="list-style-type: none"> Takes charge in the day to day planning and management of the garden Responsible for the safe use, handling and disposal of agro chemicals under the guidance from the agriculture extension worker Organizes practical learning sessions at key stages of plant growth Links the school garden to the community in collaboration with the head teacher Coordinates with other teachers to manage the garden

	<ul style="list-style-type: none"> • Responsible for keeping school garden records including pictures • Organizes for farmer field days in collaboration with school management and agriculture extension worker. • Coordinates with all other teachers to utilize the school demonstration garden to reinforce learning in all subjects.
Agriculture extension worker	<ul style="list-style-type: none"> • Provides technical guidance in garden management, advises on recommended agriculture technologies and practices including seed varieties, pest and disease management, postharvest handling and storage. • Promotes climate smart agriculture technologies • Establishes linkage between the science teacher and other stakeholders. • Advises on safe use, handling and proper disposal of agro-chemicals including used containers. • Links the community to the school demonstration garden • Participates in monitoring the school garden • Participates in the overall planning for the garden during School Nutrition Committee meetings
Nutritionist/Health worker	<ul style="list-style-type: none"> • Supports the school to plan for cooking demonstration sessions • Participates in health and nutrition education during cooking demonstration • Participates in the overall planning for the garden during School Nutrition Committee meetings
Parent / farmer groups	<ul style="list-style-type: none"> • Participate in garden management under the overall guidance of the Science teacher • Replicate learnt technologies from the school to households and the community • Provide additional labour and expertise for the school demonstration garden • Support the construction of a school garden shade for emergency storage of produce
Lead farmers	<ul style="list-style-type: none"> • Organizes parent/farmer group members to participate in demonstration garden activities • Link the community to the school demonstration garden • Upscale the technologies to other community members
Security guards	<ul style="list-style-type: none"> • Watch over the school demonstration garden

Section E: School Garden Size

The size of the school demonstration garden depends on the number of demonstration crops to be grown. For schools with limited land such as those in urban areas, sack gardening can be applied (see annex 1).

For purposes of ensuring uniformity, a standard demonstration garden should measure at least half an acre or 2000 square meters. This land can be utilized as follows;

1. Choose the type of crops to plant in your demonstration garden, for example; iron rich beans, Orange Fleshed sweet potatoes, vegetables (indigenous and exotic), fruit trees and woodlot.
2. Divide the garden into equal portions based on the number of crop varieties you want to plant.
3. Choose the crop varieties to demonstrate e.g. NAROBAN 1, 2, 3, 4C etc.
4. Each demonstration plot e.g. of NAROBAN 1, 2, 3 etc. should measure a minimum of 5x5 meters.
5. The distance between plots of two different crops should be 2 meters while the distance between varieties of the same crop should be 1.5 meter as illustrated below;

NB: For each crop, consider to demonstrate more than ONE crop variety for performance comparison.

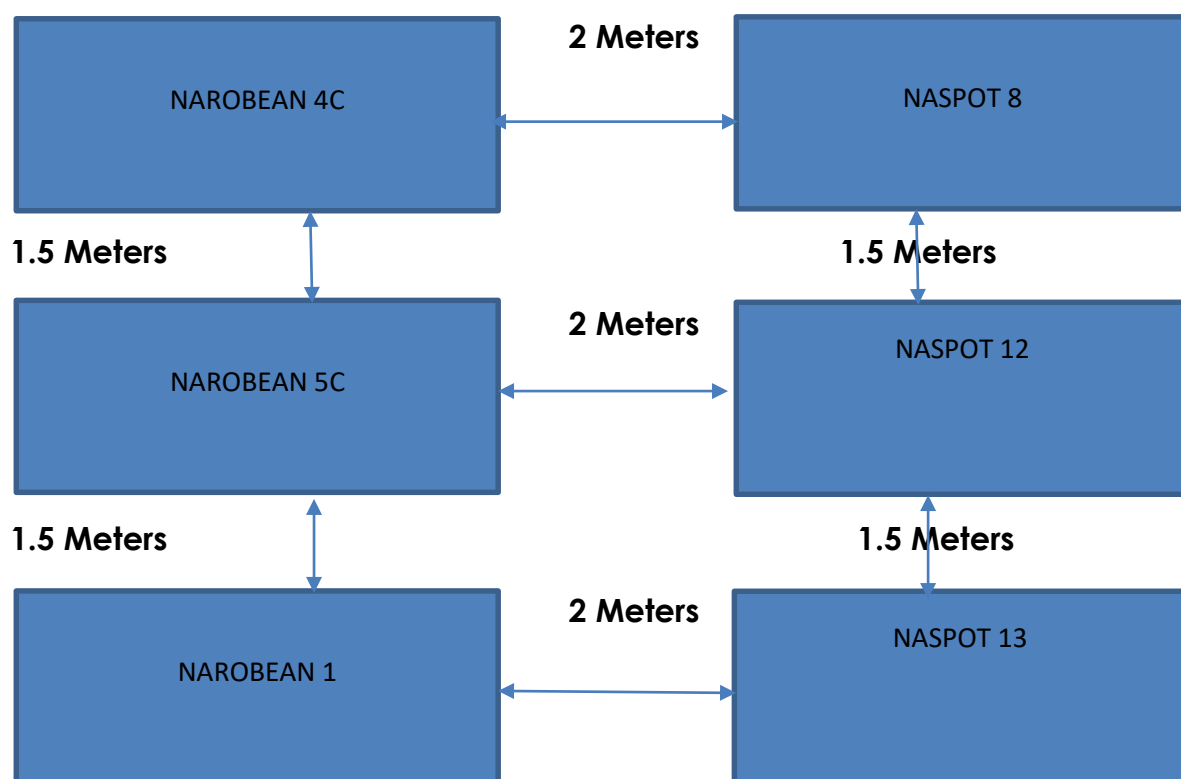


Figure 1: Demonstration Garden layout

Section F: Site Selection and Location

When choosing a site for the school demonstration garden, consider the following;

1. A relatively flat (not prone to soil erosion etc.)
2. Proximity to a water source. In case irrigation will be required, a plan for irrigation should be developed (water harvesting, valley dams, procuring water tanks, etc.)
3. A site with heavy green vegetation e.g. elephant grass (a sign of soil fertility)
4. Free from stones and rocks and freely draining soils
5. Proximity and accessible to learners and the community; the location should allow school going children to easily access the garden
6. Visibility to school going children and the community; Choose a site that allows school going children opportunity to observe and work in the garden
7. Security from animals and thieves

Section G: Seed Selection, Storage and Planting

The following should be considered when selecting crops and seed to plant;

1. Improved high yielding and nutritious crop varieties should be selected
2. Quality and certified seed should be obtained from recommended seed companies, agro dealers and local seed businesses. This is the ideal and recommended source of seed.
3. Always check for expiry date on the seed package.
4. For the case of home saved seed, viable seed, free from pests and diseases should be selected. However, guidance should be sought from the extension worker to avoid spread of disease.
5. Choose the most preferred crop varieties for specific regions
6. Include local crop varieties including indigenous vegetables for comparison with improved varieties in terms of; yield, adaptability, etc.
7. Before planting, seeds should be stored in their original packages in a dry place to maintain viability and avoid pest infestation. While Seedlings should be kept in a safe place with adequate sunlight

Section H: Land Preparation

The main goal of land preparation is to ensure a fine seed bed, the following need to be done;

1. Bush clearing (avoid bush burning), the trash can be put on the side to dry for use as mulch.

2. First ploughing to open up the land
3. After two weeks from first ploughing, carry out Second ploughing
4. Carry out Harrowing if need be to ensure a fine seed bed

Section I: Planting

1. Planting should follow Good Agronomic Practices (GAPs) for each specific crop including; spacing, seed rate, varieties and fertilizer application where necessary. Contact the Agriculture Extension worker for guidance on this.
2. Always apply Climate Smart Agricultural technologies
3. Plant early soon after onset of the rains and when you are assured of sustainable rains/source of water.
- 4 **Lay out:** in case of a steep slope, planting should be done across/horizontally instead of along the slope/vertically down slope to avoid run off
5. Control of erosion: consideration should be taken in the control of soil erosion, extension officers should provide guidance on appropriate methods to be used eg strip cropping, *fanya juu*, *fanya chini*, contour bands, mulching.

Section J: Fruit Trees

1. Each fruit tree should be labeled following the recommended labelling guidelines above. However, in case the same variety of fruit trees is grown together, one label should be used
2. Fruit trees should be planted within and around the school compound following the right GAPs as recommended by the agricultural officer. Fruit trees with a small canopy such as tree tomato can be grown on the boundary of the school demonstration garden.
3. Plant fruit varieties which are resilient to the environment and appropriate to the agro-climatic zone such as mangoes, tomato trees, paw paws, jack fruit, guavas and avocados.
4. The fruits should be consumed by the learners

Section K: Fencing

Having a fence around a school demonstration garden is essential to offer additional protection, minimize and or control damage to the crops by domestic poultry, animals, and even school going children. The following should be considered;

- The total demonstration garden should be fenced preferably using locally available fencing materials e.g. barbed wire, wire mesh, wooden poles, rods, live fence (ficus, hedges) etc. There should be a gate to allow access.

Section L: Labeling Requirements

Each School Demonstration garden should be labelled, and the following included in the labeling;

Demonstration Garden label: The Demonstration Garden label should measure at least 75 cm x 120 cm and located at/close to the entrance of the garden and to contain the following information:

- Project name / funding institution
- Identity of the school demonstration garden eg. Makoba Primary school demonstration garden
- Key technology being demonstrated eg. production of nutrition dense foods

Plot Labels: Each plot should be clearly labeled, with each label measuring at least 15 cm x 30 cm with white background (15cm x 30 cm is an estimate of A4 size paper to be used for labelling plots, laminated and inserted in each demonstration plot).

- Name of crop planted including;
- Variety name
- Local name
- Botanical/ scientific name
- Planting date.
- Yield potential
- spacing
- Nutrient information (Key one(s) supplied by the crop for human nutrition)
- Fertilizers applied, if any.

Section M: Safe Use, Handling and Proper Disposal of Agrochemicals (Pesticides, herbicides and fertilizers)

The purpose is to reduce human (the users and non-users) exposure to toxic effects of agrochemicals and minimize degrading effects of agrochemicals in the environment.

1). Pesticide users are required by law to comply with all the instructions and directions for use indicated on a pesticide label. The pesticide label for example tells the user the period you should take before harvesting a crop when you have applied a pesticide on it (Pre harvest interval). This prevents harvesting crops with pesticide residues.

- 2). Buy pesticides from registered dealers not hawkers.
- 3) Never buy pesticides; not packaged in its original container, without a label) and expired pesticides.
- 4). Never transport pesticides with feed, food, clothing, and passengers. This will help to avoid contamination.

Storage

5). Keep pesticides in a separate store not in the vicinity of human and animals. The store should have smooth concrete floor, walls and ceiling to protect the pesticides from heat. It should have a minimum size of 3m by 3m. This will also store the fertilizers, the full set of protective wear, the spraying machine (Knapsack sprayer). It should have pallets and shelves for storage of fertilizers and pesticides respectively. The door should be metallic and the store should have ventilators. Always under key and lock.

However, as a transition phase and given the relatively high cost of establishing a standard separate store in some institutions, a tailor made wooden box can be fabricated for agrochemical storage. Strictly, this should be taken as a temporary measure and inbuilt strategies must be in place to ensure a standard store is put in place as soon as possible. The box should be made of wood and should have a minimum size of 1.5m long, 1m wide and 1m high. It should have well fitted locks and handles and should be kept locked at all times when not in use. It should be kept in a cool dry place, out of the reach of children. It should not be kept in the food storage, cooking or eating premises. The box should have inbuilt compartments to ensure the necessary separation of chemicals as recommended. Chemical spillage should be strictly avoided and the box should be thoroughly cleaned using detergent in case of chemical spillage.

- 6). Never leave pesticides within the reach of children.
- 7). Put up clearly visible signs forbidding entry to the outside store that contains the pesticides.
- 8). Always keep pesticides in their original containers with the original label attached.
- 9). Keep pesticides away from fire.
- 10). The liquid pesticides should be kept separate from the dry (powder, granules) ones.
- 11). Securely close containers when not in use. Dry pesticides tend to cake when wet or subjected to high humidity. Opened bags of dry pesticides can be placed into sealable plastic bags or other suitable containers. This reduces moisture absorption by the material and prevents spills should a tear or break occur.

12). Never attempt to store pesticide left overs in the sprayer.

Mixing and Application

13) School going children. The teacher in charge of the school garden is the one responsible for mixing and application of agrochemicals.

14. Children, pregnant women and allergic persons should not handle pesticides and fertilizers.

15. Wear protective gear (water proof overalls, gloves, boots, hats, face shield.) when handling pesticide treated seed bags, pesticides and fertilizers.

16. Mix pesticides in a well-ventilated location to avoid pesticide fumes that can concentrate in a closed area.

17. Follow instructions on the pesticide label.

18. Never eat, drink, breast feed or smoke during pesticide treatment.

19. Do not try to blow out a clogged nozzle with your mouth.

20. Keep to windward in order to avoid drift and contamination of non-target objects.

21. Have plenty of water and soap available at the application site.

22. Do not work alone. In case of an accident, you have someone to assist.

23. Warn people in the area that you are going to treat the school garden with pesticides by putting a signpost.

24. Wind, temperature and rain are crucial before beginning a pesticide application. Strong wind will cause pesticide drift to the applicator; rain will dilute the pesticide concentration and high temperature may cause convection currents that will carry away the pesticide.

25. Apply pesticide leftovers in the spray tank on the borders of the target area and not on the already sprayed crops, as this will result in over application.

26. Neither spray leftovers near open waters nor pour them down the drainage systems.

27. Do not feed left over pesticide treated seed to livestock and human beings.

Clean up of protective gear and Knap sack sprayer

28. Wash all protective gear separate from other clothes with gloves.
29. Wash the knapsack sprayer with soap and water every after use. Flush water through the nozzle at least 3 times. Dry it thoroughly in a windy place and then keep in the agrochemical store.
30. Clean properly the nozzles after use by soaking in soapy water, clean with a soft brush and rinse. Do not open blocked nozzles with a sharp object. You will increase the size of the nozzle hole.
31. Wash the gloves before removing them with soap and water then wash the body.

Clean up of spills

32. Spread sand, saw dust or charcoal ash over the spilled area and let it soak for at least an hour.
33. Put the mixture into appropriate containers and label them. Store the contaminated materials safely until disposed by the responsible authority.
34. Do not use water to clean up pesticide spills

Disposal of expired agrochemicals, treated seeds, & empty packaging

35. Do not leave empty pesticide containers at the application site. Triple rinse the empty pesticide containers with water then puncture and keep separately in the agrochemical store.
36. The expired agrochemicals, treated seeds and empty packaging will be collected by the Regulatory Authority for disposal by the Hazardous Waste Management Company.
37. Do not burn empty pesticide containers and seed treated bags.

Section N: Harvesting

1. Crops should be harvested at full maturity, delayed harvesting leads to post harvest losses
2. Use recommended harvesting practices to minimize spoilage/damage
3. Vegetables should be harvested preferably in the evening to avoid wilting while beans should be harvested not later than midday to avoid shattering (postharvest losses)

4. For grains, thresh and dry to 13% moisture content

Section O: Post-harvest handling of produce

Drying

- Crops should be fully dry before storage to avoid aflatoxin contamination especially for grains
- Use recommended drying practices; Dry produce on tarpaulins, raised racks, concrete courtyards NOT on bare ground

Storage of produce

- A garden shade should be constructed within or close to the garden to enable emergency storage of produce especially fruits and vegetables
- Every school should have a designated place for storing harvested crops (free from pests/rodents and well ventilated)
- Produce such as beans can be replanted for at most two seasons, after that, the ability to germinate is reduced
- For longer storage to over a year, use hermetic bags, air tight containers, and silos for grains
- Be mindful of maximum storage period of produce depending on type and intended use (replanting or consumption)
- Avoid contamination with other varieties to preserve the genetic purity of the crop
- Store produce on a raised wooden platform-do not use stones or bricks but use pallets and should be kept away from the walls. Ensure you leave space in between stacks and from the wall to allow activities such as pesticides application and cleaning.
- The produce to be stored in a well labelled container indicating date of storage.

Section P: Utilization of Produce

1. Once the produce is harvested, schools are encouraged to conduct cooking demonstration and involve the nearby community
2. Health and Nutrition education should be conducted with support from health workers from nearby health facilities during cooking demonstration

3. During nutrition education, school going children should be made aware about the key nutrients in different foods and their role in the body
4. Community members should be encouraged to replicate at their homes what they learn during cooking demonstration. Thus, the school should share the planting materials such as beans, sweet potato vines amongst Parent Group members and other community members for replication in their homes to enhance adoption and link school demonstration garden to the community.

Section Q: Record Keeping

- Every school should have well managed records for the school demonstration garden which clearly detail
 - Inputs used (type and quantities)
 - What was purchased and when
 - What was planted and planting date
 - What was harvested and when
 - How much was harvested
 - How was the harvested produced utilized/distributed etc
 - The school garden map/layout
 - What and number of agronomic practices
 - List of visiting community members
 - Rainfall patterns (start, duration (days))
 - Performance of different crop varieties/yield plan
 - Key lessons and challenges
 - Pests and diseases occurrence (type, when, management if any)
 - Management practices utilized

Section R: Sustainability

1. Every school should have a school nutrition action plan with clear goals and interventions to improve general pupil's nutrition status. The school garden plan should feed into the school nutrition action plan
2. The school management is encouraged to utilize internal resources to set up and manage school demonstration gardens
3. The school teacher responsible for the school garden should take lead in the management of the school demonstration garden

4. The teacher responsible for the school garden should work hand in hand with parents from the nearby community in the management of the demonstration garden
5. The School garden activities should be incorporated into curricula of relevant subjects e.g. Science, Agriculture, Home economics, social studies Mathematics, Entrepreneurship etc.
6. There must be active involvement of the head teacher in the planning and overall management of the garden
7. The school should appropriate some resources to support school garden activities

Section S: Demonstration Garden Tools Required

These include; Hand hoe, panga, slasher, garden rake, gumboots, water proof overall, hand gloves, face masks, spade, hand pruner, watering can, Knapsack sprayer, wheel barrow, knives, tarpaulins, mesh, hermetic bags, strings, measuring tape, harvesting containers, garden trowels among others

Annex 1: Peri-Urban and Urban Vegetable Production Technologies

Unavailability of land represents the highest limiting factor to food production in and around urban and peri-urban areas. Adoption of technologies that are friendly to urban and peri-urban areas makes it feasible to grow food in small spaces thereby allowing individuals and families save money for other purchases and assist resource poor families have access to a diversified nutritious, vegetable rich diet. Among the technologies that can be utilised for vegetable production in such space constrained areas include:

1. Sack Gardening

Procedure:

- put a shallow layer of soil (Compost/ loam) in the bottom of the sack
- Create a Column in the centre of the Sack using either a wire mesh (chicken wire shaped into cylinder) or (maybe) a wide PVC pipe (or some other material that makes a cylinder)
- Fill the column with gravel/stones
- Shovel the soil around the stone-filled column
- Fill out the sack/bag to the edges.
- Pull the pipe/column support up gently after filling the sack to the top, leaving the rocks in a column in the center.
- If the pipe is short or you have used a column support that is short such as a detergent bucket, repeat the above steps until the bag/sack is full of soil with a column of gravel at the centre. If the column support used is a wire mess, you could leave the it inside when you have finished
- The column is for drainage and water distribution throughout the sack.
- Cut a small hole in the sack for planting along the sides, like an upside down "T,"
- Scoop out soil from below the cut to make a little shelf for the plant.
- Plant root crops on top and leafy vegetables and herbs in the sides.
- Continuously water the sack garden and place it in a sunny spot
- Continuously cross your fingers through the soil to loosen it up



L: Starting to create a gravel Column; **R:** Small holes Pierced in a filled-up sack



L: seedling being assembled for transplanting in filled up sack; **R:** planted sack

2. Plastic bags



3. Use of buckets



Procedure

1. get two buckets
2. Drill Holes at the bottom of one bucket; one medium hole to accommodate a PVC pipe
3. Insert the bucket with holes into the second one without holes
4. Place PVC in its hole
5. Fill the bucket duo with soil
6. Pour water through the PVC to the bottom of bucket
7. Plant your crop, water will rise by capillarity



4. Use of old Car Tyres



Procedure

1. Cut the tyre into two halves using a saw
2. Put a drainage holes at the bottom of each half
3. Fill the tyre with loam or compost soil
4. Plant at both ends including the centre for each tyre half
5. Compress the soil to avoid soil being carried away by water.
6. Whole tyres can be used for growing root crops



**Uganda Multi-sectoral Food Security
and Nutrition Project (UMFSNP)**



MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES

P.O Box, 102 ENTEBBE

UGANDA

www.agriculture.go.ug