D.O. No. 1-8/2019-Desk (MDM)

Dated 15th October, 2019

Dear Sir/Madam

As you are aware that setting up of School Nutrition (Kitchen) Gardens may achieve the goal of learning a lifelong skill which is of critical importance in the arena of rapid urbanization and environmental issues which shapes the behavioural pattern of the students. It is just one step in right direction for school students to engage and participate meaningfully in the activities so as to inculcate the habit of growing own vegetables and fruits in the schools and in their homes.

2. We have already issued guidelines related to School Nutrition (Kitchen) Gardens in month of May-June, 2019 when PAB-MDM meetings were held and copies were distributed to all Secretaries during PAB-MDM meetings for further circulation in their respective States/UTs.

3. These guidelines are further elaborated to aid and guide the States/UTs and the same are being issued now (copy enclosed).

4. It is therefore, requested to kindly issue necessary instructions as per the Guidelines on School Nutrition (Kitchen) Gardens to your State/UT for setting up of Kitchen Gardens in all schools.

With regards,

Yours sincerely,

(R.C. MEENA)

The Special Chief Secretaries/Addl. Chief Secretaries/Principal Secretaries/ Secretaries (Education) of all States/UTs.
School Nutrition (Kitchen) GARDENS GUIDELINES
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Executive Summary

School Nutrition (Kitchen) Garden

“I saw a hungry man…”
“I taught him how to fish”

Most people will be familiar with these lines which highlight the critical importance of learning a lifelong skill. Setting up a School Nutrition Garden (also called Kitchen Garden) seeks to achieve a similar goal as it is both a place and an activity where children learn the skill of growing their own food.

The concept of a School Nutrition (Kitchen) Garden is not new, however, the unique features of the current initiative being promoted by the MHRD are refreshingly novel, namely.

1. Teaching students that a Nutrition (Kitchen) Garden can actually be set up anywhere, even in a School in a crowded urban area. This learning is critical because most people feel that a Nutrition Garden requires a large plot of vacant land. However, the fact is that healthy vegetables, fruits etc. can be grown in pots and containers on terraces, roofs or even in the entrance area of the School. Climbing varieties such as the snake gourd can be cultivated as they will creep up the walls and need no land at all.
2. **Teaching students that, with a few exceptions, every part of the vegetable or fruit can be eaten.**

   In many parts of the country, different parts of vegetables such as the flowers, the leaves, and the stems, are all eaten. For example while banana flowers are considered a delicacy in some cuisines, papaya leaves are in the limelight for their medicinal properties. Thus, instead of throwing all leaves and stems away children should be encouraged that most parts of the vegetable and fruit can be eaten, and to include these in their diets.

   Cooking competitions should accordingly be organized to support cooks in the Mid Day Meal programme to come up with innovative recipes using all parts of vegetables.

3. **Teaching students to think out of the box and find a way.** No land available in the school? Not enough rainfall? Let these not be reasons not to start Nutrition Gardens.

   Children should be encouraged to work actively in their School Eco-Clubs to identify local species which are best suited to local conditions of topography, land and climate and also identify different ways to provide water such as simple methods of drip irrigation. Schools can invite local experts and farmers to share their expertise with the children. The focus should be on finding innovative solutions.
4. **Teaching students to follow the same learning and start a School Nutrition (Kitchen) Garden in their own homes.** The purpose of setting up such a Kitchen Garden in Schools is to give students a lifelong skill and to encourage them to go home and start their own garden, in whatever space is available using their knowledge learnt in School.

5. The MHRD has asked all schools both in rural and urban areas to develop and maintain a School Nutrition (Kitchen) Garden with teachers, students, parents and even local residents being involved. Technical assistance, training, provision of seeds, sapling, organic manure etc can be obtained in **convergence** with various line departments/agencies like Krishi Vigyan Kendras, Department of Agriculture/Horticulture, Food & Nutrition Board, State Agriculture Universities, Forest Department etc. Moreover, activities like construction of boundary wall, levelling of land etc can be taken up under MGNREGA.

6. **Working in the open and cultivating their own food is one of the finest examples of experiential learning for school children and the benefits of setting up these gardens in schools are manifold.** The joy of watching something they have planted is untold and students learn about responsibilities, about learning to care for living organisms, teamwork, social skills and about healthy food alternatives. These activities can also be used for numeracy skills including measurement, areas and volumes, data gathering and presentation.

7. **Plantation in the School Nutrition (Kitchen) Garden may be carried out under the activities of Eco-Clubs, which is being set up in every school.** An Eco-Club is a group of children and teachers in schools who work to contribute towards improving environmental conditions. Eco-Clubs in schools shall empower students to participate and take up meaningful environmental conservation activities and projects.

_Each child should be encouraged to plant a tree on his/her birthday. If land is not available for plantation, they can grow plants in small containers, dibbas, broken sink etc._
Chapter 1: Objectives of School Nutrition (Kitchen) Garden

The main objectives of School Nutrition (Kitchen) Garden are as follows:

a) To help in addressing malnutrition & micro nutrient deficiencies by consumption of freshly grown vegetables.

b) To give children first-hand experience with nature and gardening.

c) To enhance the knowledge of children regarding nutritional aspects of vegetables and harmful effects of junk food.

Need and benefits of School Nutrition (Kitchen) Gardens:

School Nutrition (Kitchen) Gardens have many advantages; some of them are as under:

i. **Good for learning:** School Nutritional (Kitchen) Gardens are good for learning: they are highly practical and a direct form of education, where children can learn how to grow good food, which not only improves health, but also provides opportunities for livelihood and increased self-sufficiency. Apart from practical skills in agriculture and horticulture, gardens are a living laboratory for the study of environmental issues and life sciences.

ii. **Essential for children’s health:** These Gardens are good for children’s health and education: A good diet is essential for cognitive abilities which help in learning. Children who eat well are likely to learn well. School Nutrition (Kitchen) Gardens are not just for food, but for better eating and they can make a direct and immediate improvement in children’s diet. They can provide fruit and vegetables, rich in vitamins and minerals, add nutritional value to Mid-Day Meals, increase the variety that is so important for health and growth, and help children to appreciate and enjoy this variety.
iii. **Improve environment:** School Nutrition (Kitchen) Gardens improve the environment: Respect for the immediate environment begins at home - and also at School. The school grounds have elements of the natural environment, the built environment and the social environment: earth, plants and trees, insects and wildlife, sun and shade; water supply and sanitation facilities, paths and fences, buildings and shelters; places for recreation and study, social life and contacts with the outside world. Children’s awareness of these, and the way they learn to treat them, will help them to grow into responsible adults.

iv. **School Nutrition (Kitchen) Gardens are good for the earth:** Organic gardening conserves the soil, protects the environment and works with nature rather than against it. It is a method of growing food that relies on the earth’s natural resources, such as land, sun, air, rainfall, plants, animals and people. It uses natural methods to keep the soil fertile and healthy and to control insects, pests and diseases. Organic methods can help keep our water sources clean and free of chemicals. It is also safer for children because there are no dangerous chemicals.

v. **Good for child’s well being**

Children who are close to nature relate to it as a source of wonder, joy, and awe. Wonder, rather than books, words, or learning all the facts, provides the direction and impetus for environmental education in early childhood. Environmental education during the early years should be based on this sense of wonder and the joy of discovery.

vi. **Increases confidence in students**

It is a forum through which students can reach out to influence, engage their parents and neighbourhood communities to promote sound environmental behavior. It will empower
students to explore environmental concepts and actions beyond the confines of a syllabus or curriculum. While everyone, everywhere, asserts the importance of ‘learning to live sustainably,’ environment largely remains a peripheral issue in the formal schooling system. Students of all the Schools need to be encouraged to participate in the Eco-Club as an active member.

Impact of Climate Change and how School Nutrition (Kitchen) Gardens will be helpful:

There is overwhelming evidence that human activities are affecting the climate and this has implications for human health.

Role of School Nutrition (Kitchen) Gardens in reducing the negative impact of climate change:

Plants, trees, vegetable and fruits play an important role in reducing the harmful effects of climate change. Deforestation is one of the major reasons why the quality of air has degraded to an all-time low. The loss of trees and other vegetation can cause climate change, desertification, soil erosion, fewer crops, flooding, increased greenhouse gases in the atmosphere etc.

According to scientists, planting of trees, vegetable and fruits is the biggest and cheapest way to tackle the climate crisis. As trees grow, they absorb and store the carbon dioxide emissions that are driving global heating. Planting of new trees can help mitigate against climate change by removing CO2 from the atmosphere. Combined with the sun's energy, the captured carbon is converted into trunks, branches, roots and leaves via the process of photosynthesis. It is stored in this "biomass" until being returned back into the atmosphere, whether through natural processes or human interference, thus completing the carbon cycle.

The School Nutrition (Kitchen) Garden is therefore not only good for the School but it is also good for the environment because it reduces the carbon footprint of food by decreasing the number of miles it takes to get vegetables, fruits, legumes and pulses from the farm to Mid Day Meal kitchen. If plants, trees, vegetable and fruits are planted in the School Nutrition (Kitchen) Garden and at home, it will help store carbon from the atmosphere into the soil.
Organic local vegetable and fruits that are in season may be planted in the School Nutrition (Kitchen) Garden rather than transporting food from far away, whether by truck or jeep which uses fossil fuels for fuel and for cooling to keep foods in transit from spoiling thereby increasing the carbon footprints.

Planting trees in the School Nutrition (Kitchen) Gardens shall be an initiative towards reducing the harmful effects of climate change. There are approximately 11.75 lakh Government and Government aided schools in India and these School Nutrition (Kitchen) Gardens can have a very substantial impact on the climate.
**Chapter 2 : Setting up of School Nutrition (Kitchen) Garden: Planning and Monitoring**

**Set up Eco-Clubs in all Schools**

The Eco Clubs established in the School shall be headed by the Principal/Headmaster/Head Teacher. Preferably, two teachers per School and one class in charge will assist in carrying out activities. All the Students, teachers, and parents of the children may be members of Eco Clubs. The Students Coordinator, in each class may encourage the participation of students. The head of the Eco –Club shall be responsible for execution of the activities of the Club with the help of another Teacher. Plantation activities may be carried out under Eco-Club activities.

The Principal / Head teacher may be the team leader for establishment and maintenance of the School Nutrition (Kitchen) Gardens at School level with the help of students, SMC members, and interested persons from community etc. It is also a good idea to establish an executive team of senior students who will be able to carry on the activities without much supervision after training.

A committee may be formed at district level under the chairpersonship of District Collector / CEO of Zilla Parishad with the following members:

i. District Collector / CEO of Zilla Parishad - Chairperson

ii. KVK in-charge from the district

iii. Representative from Forest Department

iv. Representative from Rural Development,

v. Representative from Agriculture/Horticulture department

vi. Child Development Project Officers.

vii. District Education Officer - Convenor
The District Magistrate may tie up with all schools for the setting up of School Nutrition (Kitchen) Gardens in every School by converging with concerned local departments, agencies and experts.

The place outside the School boundary may also be used for the School Nutrition (Kitchen) Garden. As the involvement of children is the foremost purpose, it does not matter even if the school has little space. Three or four small beds (Kyaries) can make up a model School Nutrition (Kitchen) Garden. In general, it is advised to choose crops, plants and trees that are adapted to local conditions, easy to cultivate and fit into the School term and are culturally accepted in the area. The produce should fit in with local food habits. Most important of all is to have a supportive Head teacher who fosters the interest of the whole school i.e., teachers, students, members of School Management Committee, Parent-Teacher Association etc.

Under the ‘flexi fund component for innovative interventions’ in Mid Day Meal Scheme, an amount of Rs 5000/- per School Nutrition (Kitchen) Garden may be utilized for purchase of seeds, equipment, compost etc. on sharing basis between Centre and States & UTs. Moreover, as the power for implementing the scheme with minor modifications from the existing guidelines has been delegated to District Level Committee chaired by the District Magistrate, the committee may rationalize and allot funds on the basis of School specific requirement, within the overall average of Rs 5000/- per School Nutrition (Kitchen) Garden.

i. Planning and Monitoring of School Nutrition (Kitchen) Gardens

Schools may consider each class putting in one to two hours a week, with children taking on occasional extra responsibility for an extra half hour to an hour a week on a voluntary basis or in rotation. Each class can work separately from the others, with some coordination to avoid overlap. The class can be divided into teams or groups which can work on their own beds and also contribute to assigned tasks. This arrangement can foster class pride. Individual students or small teams can specialize in particular technical responsibilities, with impressive titles such as “Pump Engineer”, “Tool Manager”, “Security Team” and “Compost King”.

Children should be able to call on these “specialists” for information and advice. It is very important to decide on a calendar of activities. It is vital to incorporate the activities of School Nutrition (Kitchen) Garden – e.g. when does the garden season begin and end, timings for different activities, planting of vegetables etc. Children should inspect their crops every day - on the way to class, during breaks, or going home. Establishing this habit early in the year by leading the whole class out for five minutes every morning will be very beneficial. Younger children can observe and report orally; older students can collect measurements and data to produce weekly reports to be kept in a portfolio or in their group’s Garden File.
involved as much as possible. They can participate by mapping and studying the site, discussing and researching supplies and equipment needed, observing and recording garden works, guiding visitors round the site and keeping families informed, studying garden layout and garden beds.

Discussions may be carried out with SMC members and community to decide on what measures to be taken to save School Nutrition (Kitchen) Garden from chicken, birds, goats, wild pigs, buffalo, monkeys etc

ii. Preparing the site and layout:

Plain Terrain is most convenient. Steep slopes need terracing. Stones and pebbles can be used for making walls. Tools may also be provided by KVKs. Some schools manage without any tools or equipment of their own at all.

The main elements are beds, paths, plant nurseries, compost heaps and a garden shed. Activities like construction of boundary wall, levelling of land etc can be take up under MGNREGA. Good water supply provides an opportunity to decide when to plant and when to harvest. If water is scarce or expensive, measures like water conservation, drip irrigation may be taken to optimise water use. Remember that plants need plenty of sunlight (at least eight hours a day).

iii. Composting

Compost is rich in nutrients. It is used, in gardens and organic farming. The compost itself is beneficial for the land in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, and as a natural pesticide for soil. Compost is useful for erosion control, land and stream reclamation, wetland construction, and as landfill cover.
At the simplest level, the process of composting requires making a heap of wet organic matter (also called green waste), such as leaves, grass, and food scraps, and waiting for the materials to break down into humus after a period of months.

Composting is an aerobic method (meaning that it requires the presence of air) of decomposing organic solid wastes. It can therefore be used to recycle organic material. Composting requires the following three components: human management, aerobic conditions, development of internal biological heat.

Composting organisms require four equally important ingredients to work effectively:

i. Carbon — for energy; the microbial oxidation of carbon produces the heat, if included at suggested levels. High carbon materials tend to be brown and dry.

ii. Nitrogen — to grow and reproduce more organisms to oxidize the carbon. High nitrogen materials tend to be green (or colorful, such as fruits and vegetables) and wet.

iii. Oxygen — for oxidizing the carbon, the decomposition process.

iv. Water — in the right amounts to maintain activity without causing anaerobic conditions.

**Let the children prepare their vermicomposting pits:**

**Vermicomposting** is a type of composting in which worms are used to convert organic materials (usually wastes) into a humus-like material known as vermin-compost. Vermicompost enhances plant growth, suppresses disease in plants, increases porosity and microbial activity in soil, and improves water retention and aeration. Vermicompost also benefits the environment by reducing the need for chemical fertilizers and decreasing the amount of waste going to landfills.

**Rules for Vermicomposting are as under:**

i. The school children may be encouraged to carry out the activity.

ii. A bin made from untreated, non-aromatic wood may be used in the School Nutrition (Kitchen) Gardens for vermicomposting.

iii. Children may be encouraged to prepare the pit with some form of bedding, such as shredded paper, residues of cereals, pulses and peels of vegetable and fruits from Mid day Meal kitchen
and decaying leaves may be used to fills the bin and mixes with a few handfuls of soil and the worms.

iv. The vermicomposting process takes three to six months. The quality of the compost depends on many factors. Let the school students explore what they may be.

v. Earthworms are helpful in a vermicompost. There are two types of earthworms namely burrowing and non-burrowing types. Red earthworm species, like Eisenia fetida, are most efficient in compost making. The non-burrowing earthworms eat 10 percent soil and 90 percent organic waste materials; these convert the organic waste into vermicompost faster than the burrowing earthworms. They can tolerate temperatures ranging from 0 to 40°C. The burrowing types of earthworms come onto the soil surface only at night.

vi. Technical support regarding vermicomposting may also be obtained from KVKs, State Agriculture/Horticulture departments.

**Organic solid waste: green waste**

Composting is a process for converting decomposable organic materials into useful stable products. Therefore, landfill space can be used for other wastes by composting these materials rather than dumping them on landfills. The green waste from the kitchen of Mid Day Meal may be sued to fill the land fill for composting.

iv. **Water Harvesting**

Water harvesting means capturing rain where it falls or capturing the run off in the School or home and taking measures to keep that water clean by not allowing polluting activities to take place in the catchment. Water harvesting can be undertaken through a variety of ways.

In general, water harvesting is the activity of direct collection of rainwater. The rainwater
collected can be stored for direct use or can be recharged into the groundwater. Rain is the first form of water that we know in the hydrological cycle, hence is a primary source of water for us. Rivers, lakes and groundwater are all secondary sources of water. In present times, we depend entirely on such secondary sources of water. Water harvesting means to appreciate the value of rain, and to make optimum use of the rainwater at the place where it falls.

The rain water may be stored in school and used to water the plants in the School Nutrition (Kitchen) Gardens. MHRD has issued guidelines for school children on how to save one liter of water per day. Various methods and activities have been suggested to be carried out by school children to use water judiciously.

**Importance of Reuse and Recycling of Water:**

If school/home water is recycled for use in one area, this means that the school/home does not have to take water from other areas. When the water is recycled, it makes it easy for places like the wetlands to keep their water supplies. Reusing and recycling alternative water supplies is a key part of reducing the pressure on water resources and the environment.

Helping the children to learn about the importance of reusing and recycling water is of utmost importance and it may be one of the activities to be carried out under the Eco-Clubs in schools.

Letting children learn to Reuse and Recycle Water in School and at home: Some of the suggested activities are listed below, which may be carried out in school as well as in homes.

i. The water that is being used to wash fruits or vegetables is suitable for reuse. This water can be used in School Nutrition (Kitchen) Gardens.

ii. Water used in boiling vegetables etc. shouldn’t be discarded. Instead, once this water has cooled down, it may be used to water the garden or for other purposes at school and home.

iii. Children should be encouraged that while doing laundry or washing hands, the water that usually goes down the drain should be redirected for other purposes at home and school. For example, water draining from the laundry can be diverted to flush the toilet.

iv. If a water bottle has been in the fridge for too long or water in kitchen at home is kept for too long, and you do not wish to drink it, then go to the School Nutrition (Kitchen) Garden and feed a thirsty plant with it.
v. **Drip Irrigation for School Nutrition (Kitchen) Gardens:**

Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. The goal is to place water directly into the root zone and minimize evaporation. Drip irrigation systems distribute water through a network of valves, pipes, tubing, and emitters.

Water and nutrients are delivered across the garden in pipes called ‘dripperlines’ featuring smaller units known as ‘dippers’. Each dripper emits drops containing water and fertilizers, resulting in the uniform application of water and nutrients direct to each plant’s root zone, across an entire field.

Depending on how well designed, installed, maintained, and operated it is, a drip irrigation system can be more efficient than other types of irrigation systems, such as surface irrigation or sprinkler irrigation.

**With the technical support from KVKs and the local Horticulture/Agriculture Department a drip irrigation system may be put in place in Schools.**

Drip Irrigation is an efficient and simple way to grow plants and the major benefits are as under:

- Higher consistent quality yields
- Huge water savings: no evaporation, no run off, no waste
- 100% land utilization - drip irrigates uniformly in any topography and soil type
- Energy savings: drip irrigation works on low pressure
- Efficient use of fertilizer and crop protection.
- Less dependency on weather, greater stability and lower risks
Involvement of children in drip irrigation

Children should be involved in the drip irrigation process as far as possible.

- Under the activities of Eco-Club children can calculate the water used to irrigate the plants in the School Nutrition (Kitchen) Garden through traditional methods and the amount of water used via drip irrigation.

- This activity will enable the Students to learn the actual requirement of water in cultivating plants, and therefore how to save water.

vi. Using the water from the MDM kitchen in the School Nutrition (Kitchen) Garden:

The water used in the Mid- day Meal kitchen for washing the cereals and pulses may be utilized to water the plants in the School Nutrition (Kitchen) Garden. Students should be encouraged to start this practise in their own homes also.

Methods may also be developed to store the water used in MDM kitchen for future use in the School Nutrition (Kitchen) Garden if required.

vii. Support from Experts of the Krishi Vigyan Kendras

Krishi Vigyan Kendras work under the Indian Council of Agriculture Research. Presently, 706 KVKs are functional under the jurisdiction of 11 Agricultural Technology Application Research Institutes (ATARIs) across the country.

KVKs are an integral part of the National Agricultural Research System (NARS), which aims to identity location specific technology modules in agriculture and allied enterprises, through technology assessment, refinement and demonstrations.

KVKs have been functioning as Knowledge and Resource Centers in agricultural technology supporting initiatives in the public, private and voluntary sectors.

KVKs can play a crucial role in the establishment of School Nutrition (Kitchen) Gardens through provision of technical support, free seeds/seedlings, sapling, organic manure, and training of all the stakeholders at all levels as well as continuous capacity building.

viii. Support from Experts of the Forest Department

The Forest Department in every State/UT is a rich source of expertise and plant saplings. All schools should work actively with the local Dept.
Child safety in the garden

It is essential that the garden is safe for children and to ensure this please do the following:

- Select the correct-sized tool.
- Keep sprays and fertilizers out of reach.
- Do not use chemicals. Garden organically whenever possible.
- Provide safe storage for equipment and tools.
- Secure fences and gates.
- Limit the exposure to high sunlight and warm temperature.
- Make sure that where it’s appropriate, children wear suitable clothes.
- Do not leave buckets of water unattended around very young children.

Getting children interested in gardening

Children can be involved and motivated to create a garden by letting them carry out the following activities:

- Simple activities under Eco-Clubs for gardening.
- Give them their own garden space, this does not have to be big and you can start with a large container or a few pots.
- Involve older children in the planning and design of the garden.
- Use lightweight, easy-to-handle, correct-sized tools and garden equipment.
- Encourage children to dig in the soil. (younger children love making mud structures)
- Grow interesting plants such as sunflowers, corn, pumpkins, tomatoes and potatoes.
- Plant flowers that attract butterflies, ladybirds and other interesting insects or birds.
- Install a water feature (a birdbath).
- Set up a vermicomposting pit.
- Visit community gardens, children’s farms or botanic gardens for ideas.
Chapter 3: Setting up a School Nutrition (Kitchen) Garden in schools which don’t have land

i. **Benefits:**

Today with the rapid rate of urbanization, many Schools do not have free space to grow vegetables etc. For them there is an effective alternative that is simple and practical way i.e. gardening in “Containers”. **Such a garden has many benefits for Schools in urban areas as they help to "green" the school and reduce air pollution.** Other major benefits are:

a. Students learn to grow vegetables and fruits in containers, understanding that a large piece of land is not essentially required for this.

b. Utilizes and reuses discarded containers

c. Organic garbage such as kitchen scraps and anything that decays, can be processed into compost in such containers

d. Through a careful selection of the plants, the temperature of the immediate area of the School can be lowered. This is very useful in the hotter parts of the country.
e. Students will learn to think creatively and out of the box, understanding that a garden can be effectively created everywhere.

f. The greenery will definitely beautify the School and make it a visually more appealing place.

g. It will enable school children to practice “intensive” gardening through maximum utilization of limited space.

h. It will provide an opportunity to practice “intercropping” (i.e. planting a variety of plants in one container) which ensures the health of plants due to diversity.

i. Such gardens “make use of unused School spaces” (vacant staircases, school entrance sites, etc.)

ii. **Selection of Plants**

   Climber vegetables may be grown because they need less space to grow and almost all the parts of the plant are edible. Climbers can also be moulded into different shapes of arches and railings.

   Though most climbers are grown against walls and pulled upto to the next floor, the container should be slightly away from the walls and after the plant is put in it, the roots may be covered with soil and pressed. If the climber has tendrils then some kind of net can be hung from the maximum height of the wall. The tendrils will hook themselves on to the net and keep pulling themselves up. Thin ropes and string can also be used. Tendrils or winding shoots will gradually climb up the wall.

   Best climbing vegetables are:
   
   a. Pumpkin (Kaddu)
   b. Bottle Gourds, (lauki) Ridge Gourds, Bitter Gourds
   c. Cucumbers
   d. Beans
   e. Tomato
   f. Tinda
iii. **Containers which can be used to grow plants**

- While most containers can be used, it is essential that no container which earlier held any material that could be considered poisonous (e.g. kerosene) is used. This kind of garden is an excellent way to reuse discarded items that would otherwise have reached the landfill sites only. Pots and containers viz., cement pots, damaged bowls / water tanks/ buckets, tin boxes, boxes, crates, bags, unused water cans, drums of different sizes, damaged sink / wash basin, etc. can be used for growing fruits and vegetables.

- Earthen pots made of burnt porous clay in various sizes can be used to hold enough quantity of soil for cultivation. They have straight sides and are wider at the top than at the bottom to hold the compost and also facilitate easy removal of soil. In India, pots of varying sizes viz., tube pots, ¼ size, ½ size and ¾ size are used commonly.
• Old plastic pots of round and square types can be used for raising plants.

• Old polythene bags with punched holes at the bottom for drainage and filled with a porous rooting medium can be used for propagation. Sometimes, young seedlings which are raised in the nursery are subsequently transplanted in these polythene bags (e.g., papaya, curry leaf etc.). The soil mixture is filled in polythene covers and used for the cultivation of vegetables like tomato, brinjal, chilli, turmeric, coriander, etc.
Chapter 4 : What shall we grow in the School Nutrition (Kitchen) Garden?

A huge range of vegetables and fruits including roots & tubers, pulses & legumes, medicinal plants and herbs can be grown in School Nutrition (Kitchen) Gardens.

a) Roots and tubers (e.g. sweet potato, potato) are very good sources of carbohydrates, energy and some vitamins, but have less protein than cereals. They can be eaten with many other foods and can be grown in the School Nutrition (Kitchen) Gardens as per the season.

b) Legumes (e.g. cowpeas, chickpeas, beans, soya beans) are a rich source of protein. Some also have fat, vitamin E, calcium, iron and zinc, which children need to grow for the development of their brains.

c) Vegetables and Fruits: are rich in many different vitamins and minerals and other substances which protect health, especially dark green leafy vegetables and yellow or orange fruits and vegetables (e.g. pumpkin, yellow/orange sweet potatoes, papaya, mango, carrots). Dark green leafy vegetables release all their nutritional value when combined with other foods. It is essential to select only those vegetables and fruits for the SNG which are local and best suited for the topography and weather conditions. Please consult your local KVK, and also ask experts including farmers for their advice before making the final selection. Some suggested vegetables and fruits which are appropriate for the SNG are:
### Vegetables
- Amaranth Leaves (Chaulai)
- Ash Gourd (Petha)
- Brinjal Eggplant (Baigan)
- Beetroot (Chukandar)
- Bitter gourd (Karela)
- White gourd (Lauki / ghia)
- Cabbage (Patta Gobi)
- Carrot (Gajar)
- Capsicum (Shimla mirch)
- Cauliflower (Phoolgobhi)
- Cluster Beans (Guar ki phalli)
- Cucumber (Kheera)
- Fenugreek leaves (Methi)
- Spinach (Palak)
- Mushroom (Khumb)
- Mustard leaves (Sarso ka Sagg)
- Okra, lady finger (Bhindi)
- Pumpkin (Kaddu)
- Potato (Aloo)
- Turnip (Shalgam)
- Tomato (Tamatar)
- Moringa (Drumstick) (Sehjan)
- Jack fruit (Katahal)

### Fruits
- Apple (Seb)
- Banana (Kela)
- Black currant (Falsa)
- Black berry (Jamun)
- Custard apple (Sharifa)
- Fig (Anjeer)
- Gooseberry (Amla)
- Grapes (Angur)
- Guava (Amrud)
- Mango (Aam)
- Orange (Santara)
- Papaya (Papita)
- Pear (Nashpati)
- Pineapple (Annanas)
- Pomegranate (Anar)
- Sweetlime (Mausmi)
- Water-melon (Tarabooj)
- Plum (Allobukhara)
- Peach (Aadoo)
- Mulberry (Shahatut)
- Grapes (Angoor)
- Muskmelon (Kharabooja)
d) Suggestive Plants (Medicinal):

Medicinal plants, also called medicinal herbs, are a good option which may also be grown in School Nutrition(Kitchen) Gardens in schools. These plants have been used in traditional medicine practices and many are helpful in the treatment of common diseases.

i. Papaya Leaves:

Papaya leaves have high levels of antioxidants, like saponins, flavonoids, tannins, and alkaloids. These antioxidants, along with vitamins C and A, improve blood circulation count. It is claimed that papaya leaves help the body to heal faster from dengue fever by increasing the platelet count drastically.

ii. Tulsi

For centuries, Tulsi (the queen of herbs), has been known for its remarkable healing properties. Tulsi is taken as a herbal tea and its juice gives relief in cold, fever, bronchitis and cough. It is very effective against indigestion and headaches.

iii. Aloe Vera

Sap from aloe vera is extremely useful to speed up healing and reduce the risk of infections for wounds, cuts, burns and for reducing inflammation. Apart from its external use on the skin, aloe vera is also taken internally in the treatment of digestive problems.

iv. Ginger:

Ginger is one of the most delicious and healthiest spices. It is full of nutrients and bioactive compounds that are beneficial for the brain and the body, helping to alleviate symptoms of motion sickness, chronic indigestion, etc.
v. **Garlic:**
This has a unique flavor, which makes it an indispensable element in many dishes. It has several health benefits which make it a very desirable part of any SNG.

vi. **Curry leaves:**
Curry leaves or curry patta is popular because of its aroma. The leaves are rich in Vitamin A,B, C and B2. They are also a good source of iron and calcium.

vii. **Moringa:**
Fresh Moringa leaves are incredibly nutrient dense and they are rich in Antioxidants.
Chapter 5 : What parts of plants can we eat?

Most plant foods are grouped into two categories i.e. vegetables and fruits. We usually eat the roots, leaves or fruits of the plant. But some parts of some plants, which we may not usually eat and discard, are very nutritious. For example, Beet greens have more than 8 times the nutritional content of beet roots.

Some parts of plants which have high nutritional content other than the Vegetable and fruit are:

i. Pumpkin leaves and flowers

Pumpkins are very versatile in their use for cooking. Most parts of the pumpkin are edible, including the fleshy shell, the seeds, the leaves, and even the flowers.

ii. Potato’s skin

The skin of the potato is rich in fiber and many recipes can be prepared with this.

iii. Carrots tops

Carrot tops are rich in vitamin A and minerals that can be added to vegetable curries.

iv. Cauliflower Leaves

Often cut off at source, these leaves are just like cabbage and can be used in preparing a meal as they are a good source of iron.

v. Pea-shoots

The young leaves and tendrils of pea plants taste like peas. These can be lightly cooked or eaten raw and are rich in proteins.

vi. Beet root leaves

Beetroot leaves can be used as spinach, in salads or can be added to pulses also.

vii. Sweet potato leaves

They have edible leaves and tendrils which make a nice spinach substitute and the greens are easier to grow than the tubers.
viii. **Banana stem and flower:**

Banana stem and flower are good sources of Iron and minerals which can be used in the preparation of vegetables.

ix. **Citrus peel:**

Peels of citrus fruits (such as lemons) can be used as flavouring agents in vegetables and pulses. They are rich in vitamin C.

It is recommended that these parts of such vegetables should be used in the Mid Day Meal prepared in the School. Competitions can be organized and the cooks who prepare the best meals may be appreciated.
Govt school kids to raise own kitchen garden

Times of India, Newspaper, Lucknow, 19th August, 2019

Dainik Jagran, Newspaper, Delhi, 05th October, 2018
Schools turn nutrition gardens in Mizoram district

Self-sufficiency in fruits, vegetables helps them nourish children when the villages remain cut off in monsoon

Rahul Karmakar

It takes a powerful SUV almost nine hours on non-rainy days to cover 296 km from Mizoram capital Aizawl southwest to Lawngtlai, headquarters of the State’s remotest district Lawngtlai bordering Bangladesh and Myanmar.

Loaded commercial vehicles take much longer, and those carrying perishables mainly from Assam’s Sricha, 186 km north of Aizawl, take ages. By the time the pick-up or mini-trucks reach Lawngtlai, the fruits and vegetables are usually not fit to be consumed and the best of the lot are too expensive for many to buy.

This was what Shashanka Ali noted when she was posted as the Deputy Commissioner of Lawngtlai, Mizoram’s most backward and disaster-prone district where a fourth of some 70 villages remain cut off during the monsoon. It didn’t take her long to realise the shortage of quality fruits and vegetables with the deficiencies in the district’s children belonging mostly to the Chakma and Lai elitist minorities.

New idea: The first phase of the programme to create edible gardens has been launched in 213 schools and anganwadis.

Lawngtlai has 35.3% stunted, 21.3% underweight and 5.9% severely wasted (low weight-for-height) children under 5 - highest on all counts in Mizoram. Ms. Ali and her team designed a remedy: Kan Sikal, Kan Haan. In the Mizo language, it means "My School, My Farm".

"Vegetables and fruits available in Lawngtlai town are costly. But the townpeople at least get them unlike the villages where transporting perishables is unaffordable. So we thought of involving school children, their parents and teachers to create a nutrition garden in each school," Ms. Ali told The Hindu.

The first phase of the programme covering 213 schools, Anganwadi centres and childcare institutes was launched a few days ago. Another 188 would be added in the second phase while the third phase focussing on livestock and poultry farming would cover all 776 schools and centres to benefit 15,042 children.

"The aim is to make every school, Anganwadi, child care institution and hostel in Lawngtlai self-sufficient in the local variety of fruits and vegetables by 2021. This is to reduce malnutrition among children," Ms. Ali added.

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The Hindu, July 17, 2019

Nai Dunia Newspaper, Chhattisgarh, 8th August, 2019
குழியில் அமைக்கவும்!

- கல்வியாளிகள் பாலும ஸ்கூல் ஏரியில் அரைப்பேராக பெரியறியும்
- சாக்காரங்கள் பெரும்பான்மையான கட்டாணங்களை அறிவிக்கும்

MAGNIFICENT BLOCK IN RAISING KITCHEN GARDEN

Vendai major cyclonic storm brought Chennai to a standstill and made landfall and uprooted as many as one lakh and above trees in Chennai alone. The Head Master along with the National Green Corps student’s teams planned and have made a giant leap in creating a green revolution in their higher secondary school located in MMDA colony MOR Street, Arumbakkam Chennai. This team along with the school watchman, who is basically a farmer executed this plan, planted juicy and various other vegetable producing plants and have successfully, produced different kind of vegetables. These are being utilized in the MDM and also gifted to the students. The Head Masters from other schools in Chennai have been insisted to visit this school by the Chief Educational Officer.

“GARDENING, DREAM BUGGIES, THAN EXPENDED”
योजना: छात्रों को पौधों भोजन देने का उद्देश्य
कोटीगांव संकुल में मिली किचन गार्डन किया जा रहा विकसित

स्वाद सुंदर, गर्मी : विशेष विवाद
इन स्कूलों में किचन गार्डन को बनाने के प्रयासों के लिए विद्यार्थियों के नेतृत्व में विभिन्न अंशों के प्रस्ताव समेत किए गए हैं। इन स्कूलों में किचन गार्डन में उगाई गई ताज़ी सिर्फ़ों की मदद से भोजन के साथ उपयोग होने लगा है। ऐसा ही एक युवा रामसार विद्यार्थी ने गर्मी विकसित के लागू स्कूल राजकीय जिला सरकार राजस्थान के स्कूलों में वृद्धि करने के लिए प्रयास किए हैं।

दिन दस्तकों में दी लागू माई है रिचर्ड गार्डन

दिन दस्तक वालों के आंदोलन के अंतर्गत कहा गया, विभिन्न दस्तकों में दिन दस्तक को डिमांड किचन गार्डन का अधिकार दिए जाएं। इससे यह निम्न निर्देशों के प्रारंभ में ताज़ी स्खलन का समय निर्देश आया है।

Nav Bharat, Newspaper, Delhi, 5th November, 2018