

A MANUAL FOR  
INITIATING & ESTABLISHING  
A SCHOOL GARDEN



nesfas

NORTH EAST SLOW FOOD AND AGROBIODIVERSITY SOCIETY

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**IISN:**

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School garden activity in Khliehumstem, Ri-Bhoi



Students of Khlieumstem Presbyterian School, Ri-Bhoi

## **I. Introduction:**

School garden is a concept and a practice that has had far reaching benefits to the students' learning. The school garden is the practical laboratory for which the students can relate their academic subjects such as science or environment science practically. The existing school curriculum has been very theoretical that it draws the child away from appreciating farming and nature. This attitude among students is very detrimental, as many students after graduating from high school or higher level of education do not see farming as a viable option for livelihood. Through a school garden, it is believed that the students will understand how food is grown in a clean manner, without the use of chemical fertilizers and pesticides. They will appreciate the farming system and also inculcate a positive attitude towards the indigenous food system.

As part of this initiative, it is important to enhance the intergenerational transfer of knowledge. The transfer of knowledge among indigenous communities is largely oral in nature. Thus, even the knowledge regarding the Indigenous Food System is oral in nature. School gardens can play a very important part in facilitating the transfer of traditional knowledge of preservation of seeds, soil health management, pest management etc. to the younger generation. In the context of a school garden, instead of school teachers, the custodian farmers in the respective villages can be the main facilitators.

Another component that the school garden can have is that it can be a demonstration plot for growing a diverse variety of crops. It has been seen that some villages have very few varieties of crops grown. In such villages, the school garden can be a platform to showcase this diversity. Seeds can be exchanged from other communities in the region. In this way, seed varieties, which the people have lost, can be retrieved through the school garden.

NESFAS has taken up the initiative since 2013 and is continuously supporting the improvement of gardens both as educational tools and for enhancing food diversity in mid day meals. This manual is a Guide for Field Workers to initiate and establish School Gardens in the villages. It is framed with

reference to the experiences that NESFAS has had in the past and also with references to other organizations such as Slow Food International.

## **II. Objectives:**

The objectives of initiating a school garden are as follows:

- a)** To create a platform for students to connect to farming activities such as preparation of soil, sowing, harvesting, maintenance of garden etc.
- b)** To enhance the intergenerational knowledge transfer and build students' confidence in Indigenous Food System
- c)** To provide a platform for school children, custodian farmers and interested individuals to be actively involved at all levels in revitalizing and sustaining indigenous food systems based on the principles of agroecology.
- d)** To link sustainable production (particularly underutilized crops) with consumption of healthy, nutritious and tasty meals
- e)** To make the school garden a demonstration plot for showcasing the possibility of a diverse variety of crops

## **III. Approach:**

The school gardens will be implemented and it will function within the framework of agroecology i.e. use of ecological principles in agriculture. Traditional seeds will be used and not high yielding variety seeds. Seed preservation will be encouraged as much as possible. The soil health will be maintained by use of compost. Pest if any, will be managed by traditional ecological methods with the help of other custodian farmers.

Though the school will primarily manage the garden, the participation of the community members such as parents and custodian farmers is imperative for the success of the school garden.

#### IV. Expected Outcomes:

Based on the objectives for the school gardens, the following outcomes are expected:

- a) Students' connection with mother earth is enhanced and positive attitude towards farming and environment is developed.
- b) A knowledge bank of children who are knowledgeable about traditional food, farming practices (seed saving, jhum cultivation, planting, irrigation systems, harvesting etc.) has been created
- c) A large number of well-functioning school gardens that entail a large agrobiodiversity of nutritious food, which is directly used for the preparation of the daily midday meal.

#### V. Steps for initiating a School Garden:

a) **Identification of motivated stakeholders:**

NESFAS believes in adopting a bottom up approach. Therefore, it is important to identify potential project areas based on the initiative of communities and their positive response to awareness programs on school gardens. Once the community and the school authorities have confirmed their commitment to setting up a garden it is important to define the key stakeholders of the particular community.

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##### **Example of Nongtraw village in East Khasi hills:**

The school garden was proposed by the Indigenous Partnership and immediately taken up by the teachers who were knowledgeable farmers. The land was given for free by the community. On the day of soil preparation and planting, community members, especially women came to witness the opening and helped in the process. The children were involved in planting the seeds and singing. Presently, one hour is allocated per day for the children to take care of the garden and to water it.

b) **Respecting cultural norms when approaching a community:**

Indigenous societies are complex in their governance and while implementing a project such as a school garden; an organisation should be informed about the social norms and procedures, as they are usually undertaken as per community specific cultural norms. NESFAS has

experienced with communities and learned the following norms from communities in Meghalaya:

- First, contact the village headman (*Rangbahshnong/Nokma*) and inform him about the purpose of your visit and whom you would like to meet.
- Generally the headman forwards the letter to the teachers and confirms his availability.
- It is advisable to take the initiative to propose a date for the meeting with the teachers and Headman so as to be efficient and not waste time.

c) **Creating Awareness about the Importance of a School Garden**

When the meeting with the potential school garden supporters is finally held, the facilitator has the role to make the overall purpose of a school garden clear to community members. It is always an asset to cite from existing and successful examples as experienced by NESFAS communities. Once the awareness is created, together with community members, potential benefits for the specific case should be elaborated in a participatory manner. As an outcome, the involved people should ideally be convinced that what they are about to start will benefit the school and eventually contribute to the well being of the entire community. Note that not all objectives as stated above may not be fulfilled immediately but may gradually evolve. It is however important, that the school garden follows the principles of agroecology and also good, clean and fair<sup>1</sup>.

(NB: Facilitator will require materials during an awareness programme like chart papers, video etc.)

The outcome of the meeting should be that the community and the school agree to initiate the school garden. In principle, they may approve the land to be used as the garden. The land may be of the school or the community permits to use community land or an individual member of the community permits the use of his/her land for a certain time period. In such cases, where the school garden is established in private land, a written agreement between the school and the owner can be made to avoid any misunderstanding in future.

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<sup>1</sup>Good meaning tasty and culturally appropriate, clean meaning free from chemicals and nutritious food and fair meaning fair conditions to the producers and in case of selling produce also fair prices for consumers.



#### **d) Implementation:**

During the planning process, the following aspects need to be taken into consideration:

##### **i. Site selection and confirmation:**

The land will usually be selected by the school authorities and in consultation with the headman and village authorities.

During selection of land, some points can be considered such as the safety of the place (it is not too steep that students may injure themselves), there is enough sunlight and ideally closer to the water access point.

Seldom is the case where the school wants to have a school garden but does not have land or there is no community land or private land, which can be used as a school garden. In such a case, gardening is initiated in boxes where they are usually kept in the verandah of the schools. This is limited as compared to a school garden with land but nevertheless few vegetables can be grown in this manner.

If the school garden is to be established on community or private land, it is necessary to prepare papers like lease agreements with the concerned parties to avoid any misunderstanding in future.

##### **ii. Seasonal Calendar:**

Collectively, a seasonal calendar needs to be prepared for ease of understanding of sowing & harvesting seasons. At this stage, it is important to orient the school teachers and students about the 10 Food Groups as propounded by the Food and Agriculture Organization. Here, the school should be encouraged to plant as much as possible, the 10 food groups. Therefore, during the preparation of the seasonal calendar for planting and sowing, the crops belonging to different food groups can be incorporated. A knowledge holder or custodian farmer can aid in preparing the seasonal calendar especially in terms of sowing and harvesting. This calendar can be prepared in the form of a chart and put up in the classrooms so that all students are aware.

The seasonal calendar can have the following format.

Season: Month to Month		
Name of Vegetable	Month/Date of Sowing	Month/Date of harvesting

### iii. Land Use

Tools: Students and teachers often bring the basic agricultural tools such as the spade, shovel, and watering cans from their homes during the period of preparing of soil beds.

Soil preparation: There needs to be an assessment of the type of soil and the techniques for improving soil health. The teachers if they are knowledgeable can assess the soil themselves or a custodian farmer from the village can give suggestions.

Bed preparation: Depending on the need, the bed preparation can be done in two parts: Nursery bed and Main field.

Nursery bed	Main field
<ul style="list-style-type: none"> <li>i. To raise saplings for planting in the school garden.</li> <li>ii. An overhead shelter for the nursery bed may be needed.</li> <li>iii. To be free from the injuries of the seeds.</li> </ul>	<ul style="list-style-type: none"> <li>i. Raise bed: Not less than 30-50 cm height.</li> <li>ii. Drainage: For ease of walking in and out of the garden and also to avoid trampling of the beds.</li> </ul>

Manure: For soil health, the Farm Yard Manure (FYM) including compost from bio matter, leaf mulch or animal dung (decomposed) can be used for plantation. The school can create a plan for creating compost by segregating waste and using biodegradable waste for compost apart from the leaf mulch and other bio matter. There can be some biodegradable waste from the mid

day meal kitchen that is generated apart from the leaf mulch (NB: Steps on how to make a good compost is attached in the document).

#### iv. **Seed sowing seed/transplantation:**

*Seed Selection for plantation:*

Here the role of parents and community at large especially custodian farmers is very important as the seeds can be contributed by them. During this process, the seasonal calendar, which has been prepared, can be shared with the parents and the need of the 10 food groups can be reiterated. A final selection of the seeds can be done and who will contribute the seeds can be discussed.

Spacing should be maintained while sowing. It differs from plant to plant and from row to row. For example: 2 ft for bigger plant e.g.,: Cauliflower.

Select the dates for sowing/ transplanting of saplings. Encourage students and the school to invite custodian farmers to engage in this activity.

Encourage multi-cropping and crop rotation within the school garden.

Wild Edible Plants: Wild edible plants especially green leafy wild edibles can be planted on the hedges around the school garden. These are fast growing especially during the rainy season and can provide the needed green leafy vegetables in the meals of children.

#### v. **Fencing**

Fencing of a school garden is imperative to ward off pests such as animals which may destroy the school gardens. There are a number of ways for fencing. NESFAS encourages live fencing i.e., planting live fencing plants. This is the most sustainable form of fencing.

Engagement of women farmers in a school garden in Mawhiang:

While sowing the seeds, the women farmers from the village in Mawhiang contributed seeds and participated in the final seed selection. They had also taught the students how to prepare the soil beds and techniques to sow the seeds or transplant the saplings. The students after seeing the demonstration from the farmers, also helped in the activity. This was done at the village in Mawhiang

Since bamboo is mostly available in villages, the use of bamboo for fencing is another viable option. But this form of fencing has to be replaced at least one a year. Another viable option for fencing is to raising a mud wall of fencing, which can be to a height of 3 feet. Live fencing plants can then be grown on it.

#### **vi. Maintenance of School Garden**

Maintenance of the school gardens is an important task. Initially, schools would not have the time to spare for this activity. However NESFAS had worked with them to understand the schedule of the schools. The school has the SUPW (Socially Useful Productive Work) period for which the teachers have to prepare useful activities for the students to be engaged. This period is now mostly used for maintenance of school gardens.

A *Routine* enlisted with the tasks to be undertaken can be made. This routine will include the tasks, the class of students to be involved and the duration. This routine is put up in the form of a chart in every class so the students know their duties. A team leader is assigned for each class who will participate, oversee and report to the teachers concerned.

The main tasks during the growing season is watering and weeding. Subsequently, during the harvest season, harvesting and seed selection and preservation are other important activities. As indicated, during the preparation of soil and sowing, students' parents can be involved. This engagement helps as the knowledge can be transferred but also reduces the load off the teachers.

#### **vii. Water**

Water is becoming an increasingly critical issue and should be a focused subject area within the school garden process. Students should be made to understand that Water is a precious resource, which should be judiciously used. Assessment needs to be done to understand, availability of water sources, use of water sources and rainwater harvesting methods that exist.

Based on this information, a school garden can become an example not only for biodiversity conservation but also conscious use of available resources, water being a pertinent issue because of its scarcity during the dry months in Meghalaya.

Some suggestions for water management could include:

- First of all it is necessary to favor hardier varieties, more suited to the climate and more resistant to a lack of water. Some hybrids are more productive than traditional varieties but require a lot of water.
- It is important to follow the seasons, without trying to produce for 12 months. Proper water management can extend the productive season, but without pushing it to extremes.
- Rainwater must be collected, creating reserves (e.g., various tanks, ponds, swales and containers), which can be used to store water for irrigating the garden.
- The preparation of the ground also has an important function. Trees should be planted in a hole, with a small ditch around the trunk, which can hold water in the root area. Beds in which vegetables are being grown (particularly leafy vegetables) should be slightly raised (by around 10 centimeters) so that water does not stagnate and cause the roots to rot.
- Finally it is necessary to be careful about water distribution. Ideally small amounts of water should be distributed regularly.
- If the garden is not large, simple watering cans can be used – the cans can also be obtained from recycled materials (e.g., plastic bottles), which must be cleaned well before being used for watering. Otherwise localized irrigation systems (drip irrigation) can be set up. One can use perforated plastic tubing (but this is expensive, not easy to find and deteriorates rapidly because of the sun), or cheaper recycled materials.
- An example of drip irrigation: plastic bottles hung from a wire with a small hole to release drops of water during the night. The water does not fall directly on the plants, but on the ground between the plants, where the roots are located or a buried terracotta pot, can or plastic bottle with small holes that let the water out little by little.
- It is important to avoid surface irrigation using small channels that distribute water around the garden: this can lead to the loss of up to 50 percent of the water because of evaporation or absorption by the earth in the channel.

- Evergreen borders of plants are very useful, as they provide shade and hold water with their roots.

### **viii. Weeding**

The removal of unwanted plants is compulsory and useful. Always perform weeding before the weed bloom. Weeding needs to be shown to smaller students to avoid weeding off young vegetables.

It is important that students understand the following in relation to plants:

- Weeds shadowing the crops.
- Weeds snatch away the space, water and nutrients from the plants
- Weed stunt the crops.

### **ix. Harvesting:**

During this stage, a custodian farmer may be consulted as to when and how to harvest. The custodian farmer can demonstrate the correct technique for harvesting particular crops. Subsequently, students can harvest the crops with the supervision of teachers and farmers.

The harvest can be given to the Cook of the Mid Day Meal so that she can incorporate it in the meals for the particular day. The harvesting dates can be told to the cook a few days prior to the event so that she can plan the menu appropriately.

### **x. Seed keeping for the next season:**

Since the school gardens are adopting an agroecological approach, seeds are an important component. Although, initially, the parents and custodian farmers of the village can contribute seeds after a harvest, it is also a good practice for the school to preserve seeds for the next season.

At this stage, it is important to make students aware of the importance of indigenous and traditional varieties of seeds over the high yielding varieties. Until and unless, students are aware, seed keeping would not make sense to them.

Methods for seed preservation:

The technique seed preservation could also be discussed with the custodian farmers. However, following are the general principles that the students can follow:

As soon as the crops become fully grown in the field:

- Mark the healthy crops that are disease free with a red ribbon or red thread tied around the plant.
- Observe this plant, as it grows. If the plant shows any sign of wilting, remove the red thread otherwise if the plant(s) is healthy; let the thread remain around it.
- When it is the harvest period, do not harvest these identified plants for seed keeping.
- Before harvesting these identified plants, crops should be fully ripened. This can be ensured with the help of a custodian farmer.
- After seeds are extracted, they should be dried in the sun
- Seeds storing should be in a sunny and warm places and not in a moist place.
- Store in air-tight bottles
- Using a humidicator paper can do checking the moisture of seeds.

## **VI. Educational activities:**

NESFAS attempts to make a difference with its school gardens by making them an interactive initiative. During 2017, three schools from Nongtraw, Dewlieh and Laitsohpliah have incorporated educational activities like Agrobiodiversity walks, seed fairs and cooking competitions. Recently these three schools have influenced other neighbouring schools by developing an Indigenous Food System curriculum as attached in Annexure 2.

## **VII Monitoring and Evaluation of School Gardens:**

It is important to regularly follow up with the school gardens that have been set up under the facilitation of NESFAS. This includes a regular check if at all; the school gardens are in coherence with principles of agroecology and good, clean and fair practices and whether school gardens are achieving the objectives. Regular visits, discussions and phone calls are helpful to monitor

progress and overcome challenges. At the end of the first season, the school garden checklist (attached as an Annex to this manual-3) provides an overview of the current status. It also gives way to opportunities for adding on to the existing structure.

## **VIII Capacity building:**

Based on the need of the school, the participating schools/communities can arrange such necessary actions with the support of other agencies. For example: An exchange program among the school gardens will encourage horizontal learning. This can encourage other villages to be proactive and learn from one another. Technical inputs on seeds, water, and soil management can be arranged during such visits.





School Garden activity in Khapmaw Presbyterian LP/UP school

## Annexure 1: NESFAS's Experience on Composting: Step by step

Steps
1. Site selection: A flat ground, preferably cemented floor.
2. Collection of biomass and ingredients: -Biomass includes hay, twigs, greens, kitchen waste etc. - Ingredients include: Cowdung, cow urine, rice brand, jiggery.
3. Grade the Biomass.
4. Sprinkle water on the biomass.
5. Mix cow dung in a bucket of water.
6. Spread the biomass on the ground and arrange in layers.
7. Sprinkle cow dung mixture after each layer and compact.
8. Repeat till the stack reach around minimum 6 feet (preferred).
9. At the topmost layer, cover the stack with soil and biomass to disallow penetration of water and prevent loss of heat.
10. Leave for two weeks for decomposition process.
11. 1st turning: After 2 weeks, remove the stack in layers and keep separately--- a total of three layers. The 1 <sup>st</sup> layer will be the outermost layer, 2 <sup>nd</sup> will be the one in the middle and 3 <sup>rd</sup> will be the innermost.
12. Rearrange the different layers; put the 1st layer in the middle, the 2nd layer on the innermost and 3rd layer on the outermost and compact each layer.
13. Cover the stack with soil and biomass and leave for 10 days. <i>What to expect after 1st turning?</i> On removing the 1st layer, Insects will be very prominent along with a lot of moisture content. This layer produces a foul smell, which indicates active decomposition. The second layer will produce a sweet smell and presence of earthworms and a white patches formed (actinomyces) on certain parts of the compost. This compost will be almost black in colour. The innermost layer will produce a lot of heat.
14. 2nd turning- After 10 days, open the stack in layers and keep separately as previous turning
15. Rearrange the stack in layers following the previous method and cover the outer most layers. Leave for another 10 days. <i>What to expect after 2nd turning?</i> On opening the outermost layer, the foul smell will not be as strong as during the 1st turning. There will be more insects present, earthworms mostly. The second layer will give a very sweet smell and earthworms will be seen in abundant. The white patches on the compost will be very prominent which indicates active decomposition. This layer will be black in colour and can be broken easily by hand. The innermost layer will generate a lot of heat.

3rd turning: After ten days, follow the same process above. At this stage the compost is assumed to be ready for use. It can be taken to the fields and used as organic manure. If not, rearrange the stack as previous method and leave for a week for decomposition.

*What to expect?*

The whole stack will be black in colour and can be easily broken by hand. Earthworms will be seen in abundant and a sweet smell will be produced. This compost is highly rich in nutrients and is ready for use.

## Annexure 2- Indigenous Food Systems Education curriculum

The Indigenous Food Systems Education Curriculum takes into consideration seven components related to the environment for practical learning by students. The aim of this curriculum is how students can contextualized their school education especially in the subjects of environment science. Through this curriculum it is hoped that students will enhance their knowledge and have a close relationship with their local environment.

**1. SOIL:** Soil is a complex, living, changing and dynamic component of the agro-ecosystem. The word soil, in its broadest sense, refers to that portion of the earth crust where plants are growing. Soil includes material derived from rocks, organic and inorganic substances derived from living organisms, and the air and water occupying the spaces between soil particles.

Competencies: (a) To be able to identify the types of soil found in the village where the students come from.

Methodology (Activity): Ask parents and meet with at least two custodian farmers and collect soil samples.

### Steps –

1. Help the students in identifying the custodian farmers.
2. Fix the day that is convenient with the farmer to show soil types and importance.
3. Meet the custodian farmers and ask about village soil.
4. Students will collect and label different types of soil using plastic bottle
5. Labeling the collected soil in the following orders:
  - Name of the student:
  - Class:
  - Name of village:
  - Name of custodian farmer:
  - Type of soil:
  - Location where the soil sample is collected:
  - Name of teacher supervisor:

Materials required: - Plastic bottles, Pen/Marker, Paper, Hoe.

Project work: Display of soil in plastic bottles.

NB: The school needs to beautifully arrange the bottles of soil samples.

Time line: 2 days

(b) Basic knowledge on soil management:

Methodology (Activity): Demonstration of local best practices like terracing, mulching, tree plantation etc.

Steps-

1. Identify the land where demonstration will take place. This could be in the school garden.
2. Help the students in identifying the custodian farmer
3. Demonstration or visit the fields where best practices can be seen.

Materials required: This will be based on the suggestions given by custodian farmers.

Project work: Ask the students to prepare with a good model on soil management.

Time line: 5 days

(c) How to feed the soil?

Methodology (Activity): Demonstration of local best practices like composting.

1. Ask the students to find out from the custodian farmers regarding the existing practices on how to feed the soil.
2. Fix the date to demonstrate in the school garden.
3. Demonstration.

Materials required: This will be based on the suggestions given by custodian farmers. For composting: Raw materials (Dried leaves, food, food waste), shovel, cow dung, urine, and jiggery or preferably local materials available in the village.

Project work: Involve the students in making a composting within the school garden. Also encourage them to make within their own kitchen gardens.

Timeline: Depends on the local practices.

2. **FOREST:** Forest is a complex ecosystem consisting mainly of trees that buffer the earth and support a myriad of life forms. The trees help create a special environment which, in turn, affects the kinds of animals and plants that can exist in the forest. Trees are an important component of the environment. They clean the air, cool it on hot days, conserve heat at night, and act as excellent sound absorbers.

Competencies: To be able to know the type of forest found in the village and to be able to identify wild edibles and trees that are climate resilient and drought resistant in the forest.

Methodology (Activity): Agro-biodiversity walks for school students (Identify, preservation techniques).

#### Steps –

1. Help the students in identifying the custodian farmers.
2. Invite the identified custodian farmers to come and talk about the types of forest found in the village.
3. Identify the forest with custodian farmers for Agro-biodiversity walks.
4. Develop a simple format to document the identified plants.

Materials required: List of plants they identified in the ABD walk.

Project work: ABD walks by students

Timeline: 3 days

**3. FOOD AND NUTRITION:** The effective management of food intake and nutrition are both keys to good health. Smart nutrition and food choices can help prevent disease. Eating the right foods can help your body cope more successfully with an ongoing illness. Understanding good nutrition and paying attention to what you eat can help you maintain or improve your health

Competencies:

To be able to grow the local vegetables including wild edible plants within the school garden.

To be able to cook delicious local edibles that is available in the village.

To be able identify food that helps in the building of the body e.g Yam, pudina, potato, sweet potato, turnip, radish etc.

Methodology (Activity): Gather information from local knowledge holders of the village and from parents.

Steps –

1. Identify vegetables grown in school garden or kitchen garden or agricultural fields.
2. Identify wild edibles in these places.
3. Categorize the vegetables into different food groups such as Carbohydrates, Vitamins and Minerals, Proteins.
4. Make a seasonality calendar for availability of these vegetables.
5. Invite the local cooks to demonstrate on how to cook delicious food by taking Dietary Diversity into consideration.
6. Link to the Midday meal programme.
7. Documentation.
8. Categorization of food plants into different food groups ( Local Food Groups Categorization, how community categorize their own food system)

Materials required: Materials for planting like hoe.

Project work: -Listing of vegetables and categorization into food groups,

- Seasonal calendar.
- Cooking competition.
- Drawing and labeling competition.

Timeline: Continuous process.

**4. SEEDS:** The seed in a plant is the part that develops from the ovules after fertilization. They are enclosed in the fruit which develops from the fertilized ovary. The seeds are formed as a result of sexual reproduction and contain the young embryo which can develop into a new plant.

The seeds perform the following functions:

- They help in germination of the new plant.
- The seeds contain food reservoirs in the form of cotyledons and endosperm.
- The seed coat is protective in nature, which protects the embryo inside.

Competencies: To be able to identify the source of seeds, ways to preserve, and produce local seeds, types of seeds and their seasons of sowing and harvest.

Methodology (Activity): Teaching on local seeds by Custodian farmers and local knowledge holders:

Steps –

1. Identify Custodian farmer.
2. List the seeds available with the farmers.
3. Learn how to store seeds.
4. School documentation like seasonality calendar, stories on local seeds.

NB: The school can construct a storage room near the school garden. The storage room can be used for various purposes like keeping seeds etc.

Materials required: Place to display local seeds

Project work: Local seed display, Drawing competition

**5. WATER:** Life is believed to have originated in the aqueous solutions of the world's oceans, and living organisms depend on aqueous solutions. Water occurs as a liquid on the surface of Earth under normal conditions, which makes it invaluable for transportation, for recreation, and as a habitat for a myriad of plants and animals. The fact that water is readily changed to a vapor (gas) allows it to be transported through the atmosphere from the oceans to inland areas where it condenses and, as rain, nourishes plant and animal life.

Competencies:

To identify the water source and ways to preserve it.

To know the Do's and Don'ts near water source.

To know how to purify the water before drinking it

Methodology (Activity): Demonstration: Combination of modern to traditional way on how to harvest, preserve and purify water.

1. Identify the local experts.
2. Make a visit to the water source.
3. Water testing (If possible).
4. Demonstrations on how to harvest preserve and purify water with the help of



external experts.

Project work: Model with local resources on methods of rainwater harvesting.

**6. POLLINATION:** Pollination is very important because it leads to the creation of new seeds that grow into new plants. But how does pollination work? It all begins in the flower. Flowering plants have several different parts that are important in pollination. Flowers have male parts called stamens that produce a sticky powder called pollen. Flowers also have a female part called the pistil. The top of the pistil is called the stigma, and is often sticky. Seeds are made at the base of the pistil, in the ovule. To be pollinated, pollen must be moved from a stamen to the stigma. When pollen from a plant's stamen is transferred to that same plant's stigma, it is called self-pollination. When pollen from a plant's stamen is transferred to a different plant's stigma, it is called cross-pollination. Cross-pollination produces stronger plants. The plants must be of the same species. For example, only pollen from a daisy can pollinate another daisy. Pollen from a rose or an apple tree would not work.

Competencies: To be able to identify various agents' pollination and the role they play.

Methodology (Activity): Practical demonstration sessions by taking students to forests, land of cultivation..

Steps –

1. Identify local knowledge holders.
2. Have a session on how to map or identifying the various agents of pollination and the role they play.
3. Visit the neighboring farms to map the pollinators.

Materials required: Planting local trees within the school garden or within the village to attract pollinators.

**7. MARKETS:** A market is a physical retail marketplace intended to sell foods directly by farmers to consumers. Farmers' markets may be indoors or outdoors and typically consist of booths, tables or stands where farmers sell fruits, vegetables, meats, cheeses, and sometimes prepared foods and beverages.

Competencies: To know the type of crops including wild edible plants sold in the market and how they are priced

Methodology (Activity): Approach known sellers from the village:

**Steps –**

**1. Help the students in identifying local sellers.**

**2. Make a visit to the house of the identified sellers or make a visit to the nearest local markets.**

**3. Have a session in the school (if required).**

Materials required: This will be based on the suggestions given by local sellers.

Project work: Drawing crops and wild edible plants sold in the market.

### **Annexure 3: Checklist for school gardens**

1. Name of community:
2. Number of people involved:
3. Occupation of involved people: (e.g., teachers, farmers, cooks, children, parents etc.):
4. Crops grown:
5. Main cultivation method (open land/boxes/both):
6. Seeds used:
  - Traditional seeds (derived from within the community).
  - Non-traditional seeds.
7. Are non-traditional seeds open pollinating varieties?
8. No. of pollinators' crops:
9. Does the garden have compost?
10. What are the irrigation systems in place?
11. No. of seasons and months in which vegetables are harvested:
12. Amount of harvest (approx.).
13. Does the yield exceed, meet or lack the needs of the school children?
14. What are the Issues faced:
15. Current way of coping with issues:
16. Educational activities in place (cooking workshop, environmental lessons, taste workshops, quiz...).
17. Any other regular activities related to the school gardens (children's day, food festival, competition).