

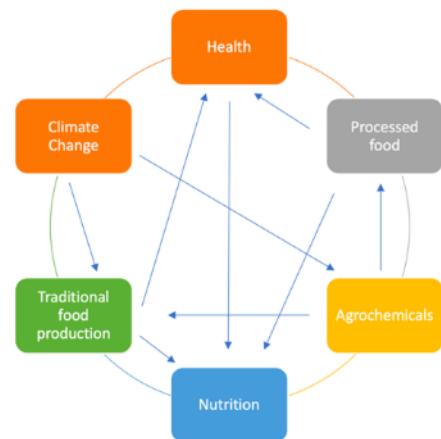
Exemplar: Food and Nutrition

How do we ensure health and nutritious food for all?

Recent studies have shown that nearly 2 billion people in the world have no access to safe, nutritious and sufficient food. In addition to this, 135 million people will suffer from hunger and starvation in 2019. The recent COVID-19 pandemic could put an additional 130 million people at risk of acute hunger. There are many interrelated issues including poverty, lack of empowerment, climate change, economic downturns, man-made conflicts in achieving health and nutritious food for all. Right to healthy and nutritious food is an important part of the human rights system. While SDGs and many countries have made the right to adequate food as an integral part of their global and national strategies, achieving sustainable food production and meeting the demands of growing population is still a huge challenge. In the midst of all these crises, how do we ensure nutritious food for all? Through this exemplar, we will understand how food has evolved over the years across the globe and how individual and community action can lead the way to healthy and nutritious food for all.

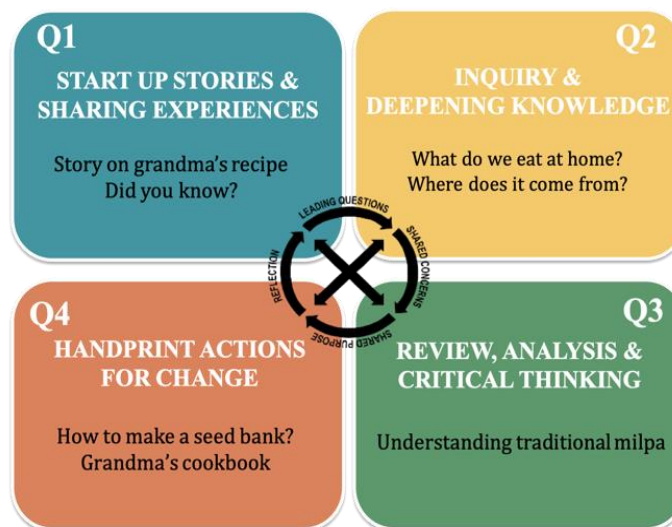
Linkages to SDGs

Many SDGs are connected to food and nutrition. Nutrition is the key point of **SDG 2 Zero Hunger**, which focuses on ending hunger, providing food security and improving nutrition and promoting sustainable agriculture. **SDG 3 Good Health and Well-being** is also directly connected to food and nutrition. Other SDGs that are connected to Food and nutrition include SDG 5 Gender equality, SDG 13 action Climate, SDG14 Life below water and SDG 15 Life on Land.



Handprint CARE Pedagogy

Teachers using the Handprint CARE pedagogy could facilitate learning among students by taking them through experience sharing to inquire about the issues to critically think about what can be done and then taking actions.



Quadrant 1

Start up Stories & Sharing Experiences

Story 1: Grandma's recipe

The other day when my mother was preparing the food, and while I was helping her, I observed that while she was putting the oil in the pan, some tears were coming out of her eyes. I asked her if she was sad and she said no. That the smell of the oil and the tomatoes and the onion being fried in the pan made him remember something. I asked her what it was that she had remembered with that aroma and she replied that she remembered that when she was little, her mother prepared a very rich and nutritious food for her with some plants that her mother collected on the way and that were born wild in the field. Her mother made them with onion and tomato fried in oil and she had not tasted them since she was a child. I asked her why she did not prepare that food if she liked it so much but she told me that it was not possible because the plants that her mother gathered in the field were no longer easily found or in some cases they could no longer be found. So I wondered why some foods stopped cooking and why some ingredients stopped being used. I am worried that this will happen because neither I nor my brothers, and perhaps many children my age will no longer be able to eat those plants that my mother used to eat and that besides being rich and nutritious were free.

- What other foods or ingredients are disappearing or not being used?
- Why did they disappear?
- How can we recover those plants and foods that my mother ate and that I no longer know?

Story 2: Midday Meal in Schools

Providing nutritious food to students for their overall development is of primary concern worldwide. This is also closely linked to completion of schooling years of children. To enhance enrolment, attendance, retention and simultaneously to improve the nutritional status of children, a government scheme to support nutrition of primary school children was launched in India in 1995. It is now popularly known as Mid-Day Meal (MDM) Scheme which covers all school children studying in I - VIII classes where free, freshly cooked hot meals are served in schools. The aim of this scheme is to provide nutritious, well-balanced food to all children.

The meal plan predominantly contained wheat or rice (carbohydrates), pulses (proteins), vegetables, fat & oil, salt to help children meet the per day calories for growing children. Meals are usually cooked and served at school campuses, in some cases supplied either by local village leader NGO or an agency decided by the education department. The MDM scheme helps in achieving the objectives of Education for Sustainable Development (ESD) as it provides several opportunities to improve health, hygiene and social interaction and simultaneously also acts as an effective tool to enrich learning in different curricular areas. Many schools with their own kitchen garden harvest vegetables

for the MDM. Kitchen gardens are promoted as part of the curriculum to help children learn about the nutritional value of green vegetables. Water, sanitation and hygiene practices are promoted along with the programme focusing on hand washing, personal hygiene, use of water, cleanliness of cooking space and ingredients etc. Use of energy efficient ways of cooking meals is also an important learning area.

Recent studies have shown that literacy rates are higher where the mid-day meal scheme is performing well. The scheme is very helpful in achieving several SDGs where school, community, government and non-government sectors work together in ensuring a sustainable future for the young generation.

Source: *Towards a Green School, Teachers Manual, NCERT*

Did You Know?

Healthy local food

We are increasingly sure of the importance of identifying and promoting local models of healthy eating, in which the different foods that exist in the local context can be combined in specific ways. This is possible because each culture has managed to generate culturally inherited food systems that have had and can have a positive impact on health.

The relationship between culture and food defines an identity and the possibility that it can be transmitted to new generations so that they can take advantage of all the accumulated knowledge in a better integral human development in which food plays an extremely relevant role.

One of the best-known local models that has enjoyed recognition in its positive impact with regard to health and human relationships, is the Mediterranean diet. It is known as such the definition of a general eating pattern in Mediterranean countries such as Spain, Portugal, France, Italy and Greece. Due to the influence and expansion of these ideas to the rest of the world, this local diet managed to establish itself as a common diet in many parts of the world or at least the better known “local” diet.

The main characteristics of the Mediterranean diet are a high consumption of vegetables, bread and other cereals (wheat being the base food), olive oil as the main fat, vinegar and regular consumption of wine in moderate quantities.

The healthy properties attributed to this diet are based on the finding that, although more fat is consumed in Mediterranean countries than in the United States, the incidence of cardiovascular diseases is much lower^[1]. This seems to be related to the consumption of products rich in monounsaturated fatty acids such as olive oil. It is also attributed to the consumption of fish, especially blue fish, rich in ω -3 fatty acids and, finally, to the moderate consumption of red wine, to which cardioprotective properties are attributed^[2].

The Mediterranean diet is an example of how healthy and sustainable practices that have a cultural base can be enriched with food in other parts of the world, promoting intercultural dialogue and taking advantage of local cultural and biological diversity.

Although the Mediterranean diet is one of the most widespread and well-known in the world, it is important to identify and promote local diets in order to be sure that the decisions our ancestors made regarding food preparation can benefit us today regarding improving eating habits, taking advantage of the natural resources that we have and with the ancestral wisdom that we have inherited from our ancestors. Also, identify foods that were important in the diet and that for some reasons have disappeared or stopped being used.

Source

^[1] Mackenbach JP. 2007. The Mediterranean diet story illustrates that “why” questions are as important as “how” questions in disease explanation. *Journal of Clinical Epidemiology* 60(2): 105-109.

^[2] Logeril M, Salen P, Paillard F, Laporte F, Boucher F y de Leiris J. 2002. Mediterranean diet and the French paradox: Two distinct biogeographic concepts for one consolidated scientific theory on the role of nutrition in coronary heart disease. *Cardiovascular Research* 54(3): 503–515.

Quadrant 2

Inquiry & Deepening Knowledge

Did you know?

The nixtamalization and food

Almost all the peoples of the world have a grain of basic food that provides them with the basic nutrients. This grain has been complemented with regional foods, creating healthy diets.

In the case of Mexico, this grain is maize. If a population feeds on maize in its original state, it would eventually suffer from malnutrition and serious diseases such as pellagra. However, the ancient Mexicans found an extraordinary way to avoid these problems: they invented the nixtamalization process. Without this process, the importance of maize would have been less and would not have been the basis of our diet and possibly the cultures would not have developed as they did. Maize belongs to the group of cereals, a group of foods that provide us with carbohydrates, protein, fiber, vitamins and minerals.



The nixtamalization process, by means of lime, water and heat, makes the corn nutrients can be harnessed by the body. Our body needs 18 minerals. Each one fulfils a different and complementary function in our organism. Calcium is the most abundant mineral found in the human body: teeth and bones are the ones that contain the most. Body tissues, neurons, blood and other body fluids contain the rest of the calcium.



The nixtamalized tortilla gives us calcium. Maize contains calcium but also has phosphorus, which interferes with its absorption. However, when performing nixtamalization, the calcium provided by the nixtamalized tortilla is important. Each tortilla gives us about 55.2 mg of calcium. If we speak that in Mexico on average 8 to 10 tortillas are consumed daily, the tortilla contributes around 44% to 55% of the needs of this mineral.

As for vitamins, corn contains niacin, a very important vitamin for the body. However, niacin is not present in an available form to be assimilated by it. The cooking process carried out with nixtamalization, causes this vitamin to be released and therefore taken advantage of.



It has been reported that nixtamalized maize products provide between 39 and 56% of niacin, 32 to 62% of thiamine and 19 to 36% of riboflavin, vitamins important for the healthy development of humans.

Eco Puzzle activity 1: Exploring local knowledge and practices

What do we eat at home? Where does it come from?

Teachers can use questions given below as a lead to guide learners in conducting research (online/library/talk to an expert or family members) to find out about link between food, nutrition and traditional knowledge of their own region. Teachers can ask learners to carefully observe their house one whole day to find answers for the following questions

- How is food prepared in my house?

- How did my family prepare it in the past and how do they prepare it nowadays? If there is a difference in food preparation from the past to now, ask your parents/grandparents why it has changed? What are some of the reasons for this change?
- What ingredients and quantities are used?
- How many different types of foods are prepared in my house?
- What other ingredients / foods is it combined with?
- Where do these ingredients come from or are taken?

Once learners have completed the task, teachers can encourage learners to share their findings in the classroom.

Why traditional food?

There are thousands of crops and foods that have gradually been forgotten or through the centuries. This is very unfortunate, not only because of the spices and flavors that we are losing, but also because of the nutrients they provide and because of the knowledge that is lost around food and the way it is prepared. These crops and foods are often traditional crops that have developed in particular regions of the world. That is, they grow in small or specific geographic areas, have low economic returns, or are susceptible to pests, crops that perhaps never entered the world market and, therefore, many of us are unaware of their existence, sometimes even in our own own regions.

The United Nations Food and Agriculture Organization (FAO)* mentions five reasons why these types of traditional crops must be taken into account as they can revolutionize the future of our food:

- 1. They enrich our diets.** Traditional crops are usually very nutritious and can offer us a more balanced diet. Quinoa, for example, is the only cereal that contains all the amino acids that humans need.
- 2. They protect our agriculture.** Relying on so few crops to feed the majority of the world's population, we are vulnerable to a disease or pest that can destroy much of our food systems. Relying on a greater number of crops valued and appreciated on the world market means that farmers have more options in choosing their crops and how to intercrop them.
- 3. They help to fight against climate change.** Traditional crops are especially useful as many of them are resistant to the weather, being able, for example, to survive floods or droughts. They can also grow in some types of climates that other "standard" crops cannot.
- 4. They keep traditional knowledge alive.** Indigenous peoples have used numerous agricultural methods such as terrace cultivation that are naturally sustainable. That is, they make better use of water, do not require fertilizers or require a very small amount of these, or help to replenish the soil. Traditional methods of small-scale food production are valuable tools as a strategy for healthy nutrition.
- 5. They can enhance the livelihoods of small farmers and local producers.** Some traditional crops have good commercial potential and could be an excellent cash crop for small farmers or family farmers.

The next time you visit a local market, instead of heading towards the usual fruits and vegetables, look for those that are locally provided and that you didn't know about. You can diversify your diet if you identify nutritious local foods, which are also usually cheaper than those that come from outside. Let's begin to realize what we were missing and begin to value and spread them.

Quadrant 3

Review, Analysis & Critical Thinking

Discuss and Reflect - *Local knowledge and practices*

Teachers can enable a discussion in the classroom around the findings learners have made. Discussions can be around questions like:

- What foods or ingredients are disappearing or not being used which were used earlier?
- Why did some of the food items/ingredients disappear?
- How can we recover those plants and foods that our grandparents ate and that we no longer know?

Learners also reflect on

- Were they able to connect their findings with stories and information that they were introduced initially? If yes, what are some connections they identified? If no, what was different from what they have learned earlier in this exemplar.
- What are some things learners can do as an individual and as a collective to bring back some healthy and sustainable practices from the past?

Teachers can ask similar questions to learners in order to gauge how learners recognize issues around them, assess values around such issues and come up with solutions for them.

Did you know?

The traditional milpa

The milpa is a traditional agricultural system made up of several species that share the same space. Its main species is maize, accompanied by various species of beans, pumpkins, chili peppers, tomatoes, and many others depending on the region.

Naturally grown plants such as "quelites" are used in the cornfield (for example, verdolagas, quintoniles, huauzontle, turnips, romeritos, among others). At the same time the bushes and trees that inhabit there are used, providing fruits, fibres or seeds of local or regional interest. In this system, there are also species that can affect it, such as the cornworm, chapulines or the "huitlacoche" fungus, but which can also be used as food.



There is no single type of milpa. This depends on the characteristics of the soil, the climate, the available species, the local traditions and knowledge, as well as the culinary and food tastes and needs of the peasants. According to these characteristics, each milpa has its own peculiarities, so there is not a milpa but many types of milpa.

In the milpas we can find around 60 varieties of maize, each with different characteristics; more than five species of beans, four pumpkin species, wild and domesticated chili peppers with different forms and flavours, different varieties of tomatoes and peel tomatoes. We can also find some qualities that are temporarily used (romerito) and others that are present all year (purslane and quintoniles). The same goes for the Huitlacoche, which is already produced for commercial purposes.

The great diversity of native races of the cultivated species that inhabit the milpas are thanks to the peasants, who continue the process of domestication and diversification by keeping the seeds of the

cultivated species year after year, experimenting with new crops and variants, according to your interests. In addition, farmers continue free exchange of fruits and seeds in their immediate surroundings and out of their communities with local and regional fairs or exchanges. That is why it is very important to save seeds and then share them to have greater genetic diversity.

The milpas are the result of the sum of the knowledge, innovation and practices that peasants have developed to meet the basic needs of families. Since milpas represent an important part of the Mexican diet, it remains the basis of food sovereignty in many regions of Mexico. The milpas are a cultural and biological heritage of enormous value, since by conserving the milpas the diversity that exists in it (agrobiodiversity) is preserved and with it the availability of food; at the same time, it preserves the knowledge of many generations of peasants from different villages. If knowledge is lost, we lose food, flavors, colors, textures, genes and species, that is, our biocultural heritage.

Migration of bananas

India is the world's largest producer of bananas. Due to over-exploitation of forests for logging and encroachment, urbanization, slash and burn cultivation, wild bananas of India that have existed for thousands of years is disappearing. Because of this, many valuable species/ gene sources have been lost and the current varieties of bananas lack resistance to diseases and pests and have a very narrow gene pool. Widespread migration of fruits began during Alexander's invasion in India around 327 B.C. These bananas travelled from India to the Middle East and acquired its current name Arabic banana, or finger. Traders from Arab took it to Africa, where Portuguese transported it to Latin America and Caribbean.

India's lost variety of bananas had one species that was genetically resistant to black Sigatoka fungus disease that destroyed plantations in Amazon. Only one clone of the species (scientific name: *Musa Acuminata* spp *Burmannicoides*) remains at Indian Botanic gardens in Kolkata, West Bengal (India).

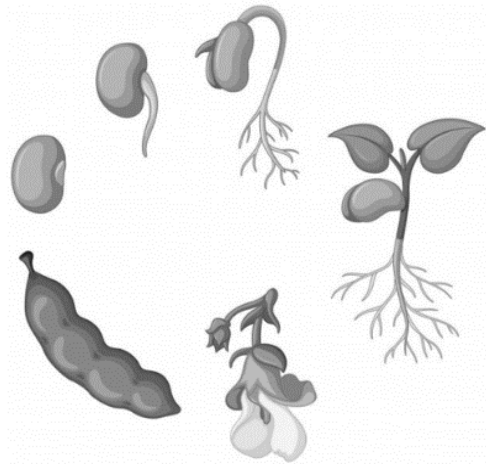
Source: Banana, spread from India by Alexander the Great, threatened on home turf. UN News

Quadrant 4 Handprint Actions for Change

Make a seed bank

Why do I do it?

- Because we know that on our planet, many species are disappearing or being replaced by other genetically modified seeds.
- Because it is we who must have control over what we want or not to consume.
- Because this way we contribute to ensure a healthy diet for the present and the future.
- Because we ensure the local production of healthy foods.



How to do it?

- Extract the seeds of products that we know for sure that are organic, that is to say that they have not been treated with insecticides, chemical fertilizers or genetically modified.
- Choose products that look good, large, with good color, that smell good and taste great.
- The seeds should be removed from their fruit and let them dry well so that they do not rot or germinate.
- Once we make sure they are dry, we must store them in a paper or cloth envelope and label them (put their name, date of packaging and if we know, their origin).
- We will bring them to school and keep them in a dry place with low light.

How to prepare seed banks in schools?

- As a class or as groups, determine a few plants from your garden or fruits/vegetables in your house that you could save seeds from.
- Read up a little bit on what season it is when you are doing this work and see what kind of seeds are best suited for that season.
- You could choose heirloom seeds or open pollinated seeds. (Heirloom seeds are old, historical varieties, which are pollinated with the same variety to keep the seed true to type. Saving seed from your own garden will be open pollinated and likely to have crossed with other similar plants growing in your neighbourhood. Your seeds will adapt to your local climate over time and may perform much better in the garden)
- If you are saving seeds from your garden, carefully remove the seeds and allow them to dry. Once dry, place them in a paper seed envelope and write down what they are and when and from where you collected them.
- Keep your seeds in a dark, cool and dry place.
- Seeds can be placed in paper envelopes, resealable bags or foil pouches in an old biscuit metal tin.
- Grow your seeds each year to be able to save more seed and ensure there are enough seeds, which will still germinate. Ensure to use the oldest seeds you have stored.
- You can also donate seeds from your seed bank with organizations looking to store seeds, share them with friends, family and other gardeners.

Grandmother's cookbook

Interviewing our grandmothers about the foods they used to consume and are no longer consumed now is a very important activity. In the first place, because it brings us closer to a past that we could not know to foresee our future.

Interview your grandmother to share recipes she used to make or eat when she was a child. Ask ways to prepare and ingredients used and create a book with the recipes that she shares with you.

Why do I do it?

- Because we can know the food that our grandmothers prepared and the ingredients they used
- Because we can compare the diet our grandparents ate with the one we consume today
- Because we can identify ingredients that are not used, that are underused or that are no longer available

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