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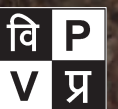
Aahaar Kranti

UTTAM AAHAAR, UTTAM VICHAAR

Permaculture Working with Nature



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EDITORIAL

Making Meals More Interesting

Nakul Parashar



The wrath of the COVID-19 is not yet over. Variants and mutations of the virus are surfacing one after another. Now it's B.1.1.529, popularly known as Omicron. At the same time, these are early days to talk about this variant, WHO has already put it in the category of Concern. Thus, time to be safe and alert. No complacency tolerated while maintaining safety and precaution. All protocols need to be followed. When would this end?

While the scientists and doctors wage their battle against the COVID-19, we need to do our bit. Needless to say, as always, our diet plays a vital role. At Aahaar Kranti, we continue to stress this need and are geared up to ensure that this message reaches every nook and corner. For this, Aahaar Kranti would showcase several associated products and content at the IISF 2021 in Goa (10-13 December 2021). Aahaar Kranti believes that our Indian cuisine has so much variety to offer that while we emphasise wholesome food, the combination makes it interesting.

It is often ignored that our health is based in our kitchens. Meal Planning has many benefits, including but not limited to ensuring healthy food choices, balanced nutrition, reducing stress, saving on precious resources, and preventing food wastage.

It is an excellent opportunity for everyone to incorporate variety in their daily meals, have tasty meals according to their family's preferences, and ensure balanced and optimal nutrition. In short, Meal Planning enables a healthy and mindful way of life.

The fact is that the entire premise of ensuring a balanced diet and nutrition for the family rests squarely and solely on the lady of the house (in most cases). This person is multitasking and taking care of a lot of related/unrelated responsibilities as well. So, when it comes to food/daily cooking, she operates mainly from her top of mind recall. The decisions are based on convenience, likes and dislikes of family members, availability of resources, etc. to name a few considerations. In order to do so, a number of ideas and start-ups have swung into action. I bumped into one such start-up called Mobile App - AMIYAA: What's Cooking, a unique Meal Planner especially designed for Indian homes. It is available on both the Play Store and App Store and is FREE for download and use. AMIYAA's focus is on "Daily Home Cooking or Daily meals", which are taken for granted by most people. (<https://www.amiyaa.com/>)

We are drawing towards the end of yet another year in the COVID-19 times. With winters being felt strongly in the northern part of the country, it's time for us to step forward and build a firm resolution to abide by following a health-centric food regimen that has variety, taste, and yet is wholesome and nutritious. Lessons learnt to be analysed, and thus, it has to be ensured that we do not repeat them in the coming year. Seasons' Greetings. ■

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Permaculture Working with Nature

G.S. Unnikrishnan Nair

In India alternative farming practices are gaining momentum nowadays, important among them are organic farming, permaculture, and natural farming. Interestingly, more and more youngsters are taking up these alternative farming practices as a serious enterprise. Australian Scientist Bill Mollison and his student and environmental designer David Holmgren formulated the term 'permaculture' in 1978. Permaculture combines traditional and unconventional management methods to enhance ecosystem delivery, using crop diversification. Originating in Australia, permaculture was initially considered a design system but

it has become a global social movement and it is practiced in different countries in various forms and at multiple scales. The philosophy of permaculture can also be traced back to traditional Indian lifestyle in which farming was part and parcel of daily life.

Basics of Permaculture

In 1978 with the publication of his book 'The One Straw Revolution' the Japanese natural farmer

Permaculture combines traditional and unconventional management methods to enhance ecosystem delivery.

Fukuoka linked the idea of 'do nothing' or 'natural farming' to permanency in agriculture. Later that year Mollison and Holmgren formulated the term 'permaculture'. After analysing traditional farming in different parts of the world where farmers have practiced permanent agriculture, Mollison and Holmgren argued that for a permanent agriculture to be achieved in the contemporary context we need to focus on small-scale production, self-sufficiency, and minimum usage of resources.

Unlike Fukuoka who believed doing nothing will lead us to a permanency in agriculture, Mollison and Holmgren put forward the idea that we need to consciously design our

SOME COMMON PERMACULTURE PRACTICES

Some common permaculture practices include 'Agro-forestry' in which trees and shrubs are grown along with crops and animals; 'Hill culture', in which 'large amounts of logs, branches and other woody material are buried to improve the water holding abilities of the soil; 'storage of rainwater' for later use and 'utilization of grey water'(water that results from activities in the home or around the farm like taking a bath, kitchen waste water etc.); 'rotational grazing' to reduce negative impact of overgrazing; 'Sheet mulching' using alternating layers of 'green' (manure, grass clippings, worm casings, vegetable scraps, hay, cocoa pods, and compost) and 'brown' materials (fallen leaves, shredded paper and cardboard, wood chips, and straw); 'natural buildings'; 'zero or minimum tillage'; 'intercropping and companion plants'; and 'market gardening' in which cash crops are grown on small land and sold directly.

environment by mimicking the patterns observed in nature to be able to achieve permanent systems that maintain themselves. The word 'permaculture' comes from 'permanent agriculture' and 'permanent culture' - it is about living lightly on the planet, and making sure that we can sustain human activities for many generations to come, in harmony with nature. According to Bill Mollison; 'Permanence is not about everything staying the same. It's about stability, about deepening soils and cleaner water, thriving communities in self-reliant regions, biodiverse agriculture and social justice, peace and abundance.'

Permaculture combines three essential aspects. They are: an ethical framework, perception about the working mechanism of nature, and a design approach. This distinctive combination is used to enable the establishment of a sustainable, agriculturally productive, non-polluting, and healthy establishment. In some places this means just adapting the existing system and in some other, it can mean starting from little or nothing.

So, permaculture is the system of designing a close farming system using the principles of nature and ecosystem services, without any negative impact on nature. It can be

a small homestead farm to a big farm spread over acres of land. The design is flexible and will vary according to the location, landscape, and need of the producer, but the basic concept remain the same. For a permaculturist it is essential to understand mechanism of the nature so that what is designed falls within the capacity of the Earth and is in harmony with the nature.

Principles of Permaculture

As far as ethical principles are concerned, Permaculture is based on three principles of Earth care, people care, and fair share. 'Earth care' stresses the significance of a healthy Earth as the basis of our human wellbeing and healthy human environments. 'People care' highlights that people need to have access to the resources necessary for their wellbeing and basic needs. 'Fair share' is about recognizing that limited resources should be fairly distributed among human beings, animals, and plants as well as between the current and future generations. It suggests this will be achieved by setting limits to our consumption and population growth.

Permaculture principles offer a set of guidelines that can be used in designing sustainable systems across the world. These principles are inbuilt in any permaculture design, in any climate, and at any scale. They have been derived from the keen observation of nature and from previous work by ecologists, landscape designers and environmental scientists. According to Bill Mollison There are 12 design principles in permaculture.





1 Observe and interact in traditional societies: Children learned to become capable adults by observing and interacting in environments shaped by their ancestors and culture. But now, modern humans have lost the ability and interest to observe his surroundings. For a good permaculture design one should closely and deeply observe and understand the nature, microclimate of the place, plants, animals, landscape, humans and their needs and natural resources in the area.

2 Catch and store energy: It highlights the need and opportunity to take advantage of leftover energy such as sun and wind energy, runoff water, resources from agricultural, industrial and commercial activities which are wasted, knowledge and skills of older people, and food and other resources. When they are available

Renewable services are those we gain from plants, animals and living soil and water, without them being consumed.

for investing in systems, it will sustain us and our descendants through times of scarceness.

3 Obtain a yield without instant and useful yields: Whatever we design and develop will tend to fade, while elements that produce immediate yields will multiply. Systems that most effectively obtain a yield, which is used most effectively to meet the needs of survival, tend to sustain.

4 Apply self-regulation and accept feedback: Self-maintaining and regulating systems are important goals of permaculture. A system

composed of self-reliant elements is stronger to interruptions. Use of sturdy, semi-wild, and self-reproducing crop varieties and native livestock breeds, instead of highly bred and dependent ones, is a standard permaculture strategy. Designing sustainable systems with zero hazards from negative feedback is like trying to raise a child without exposure to immunological and accident dangers; it leads to more serious dangers in the future. A permaculturist should be ready to accept a negative feedback that will lead to corrective action.

5 Use and value renewable resources and services:

Make the best use of nature's wealth to decrease our consumptive behaviour and reliance on non-renewable resources and services. Renewable resources are those that are renewed and replaced by natural processes over reasonable periods without the need for major inputs of fossil fuels and mined minerals. These services are those we gain from plants, animals and living soil and water, without them being consumed, for example shade given by a tree.

6 Produce no waste: Bill Mollison explains, "By valuing and making use of all the resources that are available to us, nothing is ever wasted. Recycling is the most overemphasized of the strategies for preventing waste. With recycling, an input of energy is needed to actively degrade a material to its more basic constituents. For example, recycling a glass bottle requires energy to melt and remould the glass into a new bottle. Reusing the existing bottle or not buying the bottle in the first place, is a superior option."

7 Design from patterns to details: By stepping back, we can observe patterns in nature and society. The closer we get, the less we are able to figure out the larger picture. These can form the backbone of permaculture designs, with the details filled in as we go. This big-picture perspective may leave the details a bit unclear but helps us see the harmony of patterns observable in nature and society. This allows us to better understand and value what is already working and how we might sensitively get involved as designers.

8 Integrate rather than segregate: By putting the right things in the right place, relationships build up between those things and they work together to support each other. Permaculture is part of a long tradition of concepts emphasizing mutuality and symbiotic relationships over competitive and predatory ones.

9 Use small and slow solutions: Small and slow systems are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes. For instance, the fast response of crops to chemical fertilizers is often short-lived; manures, compost, and natural rock minerals generally provide more sustained and balanced plant nutrition. So also a good result from a small amount of fertilizer does not mean better results from more.

10 Use and value diversity: Diversity reduces susceptibility to a variety of threats and takes benefit of the unique nature of the environment in which it resides. It is now widely



Polyculture is one of the most important and widely recognized applications of this principle, reducing vulnerability to pests, adverse seasons and price fluctuations.

recognized that monoculture farming is a major cause of vulnerability to pests and diseases, which results in widespread use of toxic chemicals and energy to control them. Polyculture is one of the most important applications of this principle, reducing vulnerability to pests, adverse seasons and price fluctuations.

11 Use edges and value the marginal: The interface between things is where the most interesting events take place. These are often the most valuable, diverse, and productive elements in the system. This principle works from the idea that the value and contribution of edges, as well as the marginal and invisible aspects of any system, should not only be recognised and conserved, but developed to increase productivity and permanence.

12 Creatively use and respond to change: We can have a positive impact on unavoidable change by carefully observing and then intervening at the right time. We need to accept that current larger-scale systems around us are unsustainable, and must rapidly design and develop new systems in the shadow of failing ones, rather than seek to patch up or destroy existing ones.

There are numerous benefits derived out of permaculture. These include: Protecting the planet's resources, promoting biodiversity and safeguarding wildlife, organic produce, enhancing health and saving space. The major transformative prospective of permaculture in India lies in its capacity to make small-scale farmers self-sufficient. It offers viable solutions to them where more than 80% of agricultural holdings are under 2 ha. As Bill Mollison points out, "Sitting at our back doorsteps, all we need to live a good life lies about us. Sun, wind, people, buildings, stones, sea, birds and plants surround us. Cooperation with all these things brings harmony; opposition to them brings disaster and chaos."

SOME IMPORTANT THINGS TO CONSIDER WHILE DESIGNING A PERMACULTURE GARDEN

Allelopathy: It is one of the possible causes for crop yield reduction. Sometimes a plant can have a dismal effect on its neighbours. It is therefore more common that a neighboring plant will interact in a negative manner, where the emergence or growth of one or both is inhibited.

Buffering capacity of soil: Organic matter stores and supplies basic nutrients and micronutrients that are needed for the growth of not only the plants but also soil microorganisms. Organic matter in soil also provides both cation-exchange and anion-exchange capacities resulting in the establishment of soil pH to optimum levels to facilitate nutrient absorption.

Soil and water relationship: Soil organic matter increases the rate of water infiltration, reduces runoff, and facilitates the penetration of plant roots. The rainfall that infiltrates the soil is held by the soil organic matter for plant uptake during dry spell.

Care for the Topsoil: Topsoil is that fertile rich surface layer of soil with all the nutrients, microbial life, and humus needed to sustain a healthy habitat of plants and living organisms. Topsoil is very thin compared to the other layers of Earth. It is also relatively fragile and needs

to be treated carefully because once it is gone, it is almost impossible to replace. Topsoil dies when it is over-farmed using modern farming practices that involve chemicals and synthetic fertilizers that change the soil pH killing the tiny creatures living in it, making 'dirt' that is depleted of nutrients and barren.

Care for life in the soil: The value of any soil used for farming is greatly enhanced by a healthy and active microbial population. Adopting beneficial practices or using products that promote soil health can help maintain this environment and help crops perform their best.

Understand the value of trees: Trees are important components of any permaculture system. From holding water and providing shade to reduction of soil temperature are some of the benefits they provide.

Maintain the population of natural predators: Maintain the population of natural predators by providing them with habitats as well as their food so that they will take care of the pests. ■

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Food Forest of Krishna McKenzie

G.S. Unnikrishnan Nair

In 1996, Krishna McKenzie, a 19-year-old British youngster, happened to meet and talk to Masanobu Fukuoka, the renowned Japanese farmer well-respected for his work on natural farming and revegetation of desertified land.

A quarter of a century later, Krishna McKenzie became a world-renowned figure in permaculture and natural farming. Educated at Krishnamurti School, UK Krishna got attracted towards Indian culture and way of life. He wanted to live closely with nature and produce food from a natural farming system.

Since 1996 Krishna is maintaining a permaculture food forest at Auroville, Pondicherry. He married Deepa, a Tamil woman from Thiruvannamalai.





The food forest spread over 6-acre land is named 'Solitude Garden'.

After joining Auroville he keenly observed and studied the prevailing ecosystem and designed a food forest accordingly. It is designed in such a way that over 150 types of edibles including fruit plants, green leafy plants, vegetables, tubers, oil seeds, millets and medicinal plants grow in harmony with each other and with the environment. Trees, shrubs, herbs and vines of perennial and annual nature are there forming different layers of vegetation. He has good knowledge on physiological difference and time duration between the plants, crop rotations, intercropping, mulching and uses of many native plants.

A major portion of the crops in Solitude Farm are native plants that have grown on their own. Tillage is done only during planting, if required. Otherwise, seeds are just thrown on the soil. Planting materials like tapioca stem are just immersed in the

soil without digging. According to Krishna, keeping soil in its natural stage is very important. He applies all crop residues in the soil, thus enhancing soil microbial growth and water retention capacity. They also act as natural

LAYERS OF A FOOD FOREST

A 'food forest' is a diverse system of edible plants that attempts to mimic the ecosystems and patterns found in nature. Food forests are three dimensional designs, with life extending in all directions – up, down, and out. Generally, seven layers are recognized in a food forest; the overstory, the understory, the shrub layer, the herbaceous layer, the root layer, the ground cover layer, and the vine layer. Some also recognize an 8th mycelial layer of fungi and mushrooms. Using these layers, one can fit more plants in an area without causing failure due to competition.

mulch. The rich biodiversity and non-use of chemical inputs have helped in multiplication of natural enemies of pests thus minimising crop damage.

Krishna also runs a 'Farm to Plate' restaurant in the farm. Apart from vegetables, fruits, and other food crops he utilizes 8 types of leaves and many flowers to make the local bio-region's delicacies. Food baskets containing various products are sold based on advance booking.

Krishna propagates the idea of 'circle permaculture garden' among the locals and conducts trainings on it. According to him this garden is easy to replicate in schools, public spaces, offices, hospitals etc. He says that it has a huge social and economic value by reconnecting us to essential values such as nutrition, medicinal plants, community and our relationship with Mother Nature. To honour the local community he organizes 'Lively up Your Earth', a festival of farming, traditional art, craft, dance, and song every year. ■

Covered Cultivation Techniques to Boost Crop Productivity Under Urban Farming

**K.V. Ramana Rao,
Yogesh Rajwade and
Ravindra Randhe**

The Indian urban population is around 500 million and annually it is increasing about 2.3 per cent. On the other hand, about 60 per cent of Indian population is still dependent on agriculture or allied activities and the cultivated area in urban pockets are being converted into residential or industrial purposes. The demand for quality vegetables, fruits, and flowers in urban areas is increasing at a faster rate because of increase in population. It is therefore, in the year 2011, the Government of India has launched a scheme called “Vegetable Initiative for Urban Clusters” with an outlay of ₹300 crores to arrest the rapid urbanization by encouraging farmers of peri-urban areas to cultivate quality vegetables by adopting modern cultivation techniques.



Cropping techniques wherein the microclimate surrounding the plant body is modified partially or fully as per the requirements of crops for their healthy growth is known as covered cultivation technique of crop cultivation. These techniques include mulching on raised beds, low tunnels, walk in tunnels, net houses, and greenhouses. These techniques can be used in isolation or in combination to achieve the goal of providing favourable environment to the plants for their healthy growth. Covered cultivation techniques protect the plants against natural enemies such as externalities of ambient temperatures, untimely water, competition from weeds, insect and pest attack etc. The

indiscriminate use of harmful chemicals thus be minimized in the food chain. Some of these techniques will help the urban farmers in year-round production of vegetables and flowers with higher productivity over conventional cultivation practices. Combined efforts of the national initiatives under Mission for Integrated Development of Horticulture and Pradhan Mantri Krishi Sinchai Yojana along with state line departments have created awareness and are providing financial and technical assistance to the farmers to adopt modern farming methods in crops cultivation.

Covered Cultivation Techniques Suggested in Urban Farming

Mulching

In mulching, the soil around the plants is covered with an organic or synthetic material to make



conditions more favourable for plant growth and quality crop production. The change in soil environment could be favourably controlled by selection of an appropriate mulching material. Natural mulches such as leaves, straw, saw dust, peat moss, compost and gravel have been used for centuries. With the advent of plastic films, plastic mulches have been widely accepted by the farmers due to ease of installation and other advantages such as higher crop production.

These plastics film mulches are reflective films, which reflect the direct solar radiation back to the atmosphere because of which the harmful vectors do not come close to the fields where these films are installed. By proper selection of plastic mulch colour and thickness, it is possible to get the advantage of off-season cultivation of vegetables in urban areas. Biodegradable plastic mulches are under infancy stage to find a solution to waste plastics disposal. In one acre area of vegetables cultivated under drip irrigation, if plastic mulching techniques are adopted, approximately ₹10,000 needs to be invested to get over 30 to 50 per cent higher yield with reduced chemical use over earlier practice.

Low Tunnels

In this, low hoops up to a height of 1 m to protect the plants against untimely rains, frost, pests, winds etc. are made. The structures are made of GI pipes, flexible HDPE files or bamboo



The change in soil environment could be favourably controlled by selection of an appropriate mulching material.

strips or cane. Depending upon the season and the target to protect the plant against natural enemies, the cladding material (covering) is to be decided. In order to cultivate leafy vegetables during rainy season, which fetches higher market value in urban areas, 50-micron polyethylene films with ventilating holes (4% surface area) are used to cover the hoops. To protect the plants against harsh

summers or winters, shade nets manufactured with non-woven/spun bonded fabric materials are used. To protect the plants against the insect and pest attach 40/50 mesh UV stabilized insect proof nets are used.

Walk-in Tunnels

Walk-in tunnels are similar to low tunnels except their height is above 2 m to facilitate the farmers to walk inside. A 6-m GI or flexible HDPE pipes are bent into semi-circular shape and are spaced 4 m apart to make such tunnels. Similar to low tunnels, the cladding material on the walk-in-tunnel is also dependent on the season and the type of crop which has high market demand. These structures are also suitable and effective to raise off-season nursery and off-season vegetable cultivation due to their low initial cost. Insect proof net houses can be used for virus-free cultivation of tomato, chilli, sweet pepper and other leafy vegetables with about 50 per cent enhanced yield over conventional cultivation in open fields.



Shade Net Houses

Generally, these structures are used to minimize the solar intensity on the crop canopy by using wooden logs, stone pillars, bamboo poles or GI pipes. Treatment with turpentine and tar at one side before being used for erection is essential when wood or bamboo materials are used for constructing the structure. The shade nets of different intensities (35, 50, 75 and 90%) are used as a cladding material on the top and sides of the structure depending upon the season and location where the structures are planned. Since these nets do not prevent entry of small insects/pests, the farmers often use insect-proof nets at the sides and shade net at the top to get the double benefits of minimizing solar intensities and insect/pest attack. The shade nets are available in different colours with different percentages of shade factor. Colour and shade factor are chosen depending on the crop, location, and season. High commercial value crops such as bell pepper (coloured capsicum) are grown under such shade nets.



Greenhouses

A greenhouse is a framed or inflated structure, covered by a translucent material to maintain optimum light levels for partially controlling microclimate inside the structure. The structural components of the greenhouses are mostly made up of GI or Aluminium to protect the structure against rust/corrosion for longer life. The cladding material is generally UV-stabilized diffused 200 micron polyfilms having anti-dust, anti-drip and anti-sulphur (for rose cultivation) properties. Generally, naturally ventilated greenhouses in India are constructed up to a height of 6 m to protect the crop inside the structure against hot temperatures. Inside the structure shadenets are laid at about 4 m height parallel to the

crop canopy to prevent the high solar intensities. Foggers are also installed for managing the humidity inside the structure depending upon the crop requirement. The sides of the structure are provided with insect-proof net or shadenet depending upon the crops to be cultivated. Specific varieties of Tomato, Capsicum, and Cucumber and flowers such as Dutch roses, gerbera, anthurium, orchids etc. are recommended for early payback of investment. It is believed that from one acre greenhouse/polyhouse, one can produce five times more production of vegetables over open field cultivation. In urban areas when land for farming is shrinking such techniques would prove to be beneficial not only for cultivators

but also consumers as the quality produce is possible.

Some of the techniques of covered cultivation in combination with soil-less media such as cocopeat, vermiculite, perlite mixture or cocopeat with vermi compost mixture as a rooftop gardening has become common amongst the urban households for quality produce.

To conclude adoption of covered cultivation techniques would not only provide quality produce to the consumers but also can be meet the demand of ever increasing urban population from a smaller area when compared with conventional cultivation practices. ■

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Pumpkin Seeds

Rich Source of Amino Acid and Protein

India Science Wire

We know that plants are a great source of proteins. However, despite containing this necessary nutrient, plants often do not have some of the important amino acids. For example, pulses, which are considered a great source of protein, constitute a major part of Indian vegetarian food. But according to the scientists pulses do not contain all important amino acids. Absence of these nutrients affects the development of children and causes various diseases in adults.

According to a recent study, pumpkin seeds are said to be rich source of protein and necessary amino acids. After analysing biochemical, nutritional, and functional properties of the components of protein segregated from pumpkin seeds, researchers have concluded this. They are of the opinion that if we include pumpkin seeds in our diet properly, we can get all important amino acids which are necessary for our health.

Researchers from Central Food Technological Research Institute (CFTRI) of Council of Scientific & Industrial Research (CSIR), situated in Mysore, have explained this in the research paper titled 'Food Chemistry'. This study is accomplished jointly by the chief scientist and associate professors Prasanna Basu and S. Vinayshri.

Generally, there are a lot of varieties of pumpkin, but in recent decades, *Kashi Harit* or cucurbits variety of pumpkin has got a huge popularity in various parts of India. Although people love to consume this variety seeds, the nutritional properties of it were never properly studied. Now the researchers have analysed the nutritional properties of these seeds, and found that they are a rich source of proteins.

They are of the opinion that the proteins which are present in it seeds are easy to digest. Apart from this, seeds of these variety of pumpkin have almost all the important amino acids in appropriate amount which are recommended by World Health Organization (WHO), save only one.

Sometimes a few anti-nutritional agents restrict the body to consume the nutrients found in the seeds. Taking this in view when the researchers studied further, found that pumpkin seeds do not have any such agents which bar

The proteins found in these seeds are said to have emulsifying activity which keeps the protein stable during food processing.

the protein to be absorbed. However, some anti-nutrients like tannins and phytic acid are found in a very little amount in pumpkin seeds.

According to the researchers, anti-nutrient agents can be reduced by heating or fermenting them. The proteins found in these seeds are said to have emulsifying activity which keeps the protein stable during food processing. Hence, seeds of *Kashi Harit* pumpkin are great vegetarian source of protein. Necessary amino acids can be consumed including these seeds in our daily diet in different forms.

The scientific name of pumpkin is *Cucurbita Moschata* which is a member of the family Cucurbitaceae. The plants of this family include cucumber, gherkin, musk melon, pumpkin, and water melon. These varieties are chiefly found in tropical parts of the world. ■



Grow Local & Eat Local

Santal Food Habit in Purulia, West Bengal

Nirmalya Mukherjee

Just like any other tribal communities, Santal people's food habit is simple. Nominal use of oil and spices are the major characteristics of their food. They have been eating a variety of rice, lentils, and edible green leafy vegetables (many of which are being used only by the Santal community of the area). They are liberal in their food habits as one would find various types of rats (12 types) on a limited basis, almost 20 types of birds, and various types of aquatic weeds and plants in their food. The forests nearby are the places from where they have been collecting several types of mushrooms, honey, green leafy vegetables, legumes, and fruits. They prefer using jaggery/molasses as sweeteners to sugar.

The reason behind this wide variety of food consumption by the Santal community lies in their history. Santals were hunters and gatherers, and they adopted agriculture relatively late. However, at present, approximately 95% of them are

engaged in agrarian livelihood. Paddy cultivation is the major agricultural activity among them.

They have adopted both high yielding variety of rice and traditional variety of paddy. However, they love to eat a traditional variety of rice produced in relatively small areas. They use mustard oil in cooking. In many a village till now, mustard seeds are being produced after paddy cultivation. In addition to mustard oil, they also use locally available *Mohua* (*Madhuca Indica*) oil and oil extracted from 'Kochra', a vegetable. They have their own oil extraction mechanisms. In few villages, *Kusum* oil (extracted from *Kusum* flower seeds) is still being used. This *Kusum* oil is regarded as

Santals still cultivate onions and garlic while the chillies are cultivated in the adjacent areas of their house or in the Kitchen-garden.

good as Olive oil. In their cooking, essential ingredients are only turmeric, salt, lemon, green and red chillies, onions, and garlic. In few villages, Santals still cultivate onions and garlic while the chillies are cultivated in the adjacent areas of their house or in the Kitchen-garden.

In their kitchen garden, land near to the rivers, rivulets or any water body, they produce locally available vegetables like brinjals, pumpkins, bottle gourd and the like with various leafy vegetables like *Note* (*Amaranthus Viridis*) Shaak (a type of spinach). They also eat pumpkin and bottle gourd leaves and many Shaaks which are unknown to the outer world like *Adda*, *Ohoch*, *Kana*, *Mooch*, *Dhurpu*, *Pushi Kata*, *Shir Giti* and many more, which sprout during the rainy season in the wild. These green leafy vegetables they eat after frying a little, followed by boiling them with salt. Easy availability and abundance of these shaaks in the villages and forests make them an essential part of the breakfast and lunch of the locals.



They eat both Mar-Bhat (popularly known as *Da Madi* - rice soaked in water and not separated from the remnant of the water in which it is boiled) and boiled rice separated from water (*daka*). *Da Madi* with green chilli, onion and a pinch of salt is extremely popular. Some like to have it with mashed potatoes. The rice water is considered very nutritious. Santal women usually cook rice in the early morning for all the three meals of the day. *Da Madi* and shaak are consumed during the day while meat or fish are eaten at night.

Santals eat various types of locally available fishes, be it in ponds, rivers, or in paddy fields like *Puthi*, *Chang*, and *Lyata*. Often, these fishes are roasted by wrapping them in shal or bottle gourd or turmeric leaves. This is popularly known as '*Paatpora*' or '*laad*' (in Santali). They use this method to cook meat, egg and mushroom also. Big frogs and crabs are also eaten by frying or roasting. This method of cooking is known as '*rapah*'.

At night many a tribal household prefers to eat meat. And for that, they have plenty of choices like lamb, chicken, duck, goat, pig, '*Runda*' (locally available animal) and '*Neul*' (ichneumon). The 'pitha' or cake made up of meat and powdered rice is very popular among the Santal community. These Pithas are the part of their festivals like *Saharai*. They have various types of Pithas like *Dumbu Pitha* and *Khapra Pitha*. *Sakam pitha* is prepared with rice flowers and palm jaggery. Both the ingredients are generally mixed by hand, and



Lopong Adda



Patra Pitha

Santals eat various types of locally available fishes, be it in ponds, rivers, or in paddy fields like *Puthi*, *Chang*, and *Lyata*.

then a small quantity of the same is placed in the leaf of *Tagar* (*Tabernaemontana Pandacaqui*), folded half and boiled properly. However, in the seasons when the palm jaggery is not available, they fry these pithas. In addition, they also have *Uli Pitha* (Rice flower and Mug Pulses), *Chakli Pitha* (Rice Flower and bottle gourd), *Udhi Pitha* (Rice Flower and Sesame), *Haku Pitha* (Rice Flower and Small Fishes) and the like.

Different types of Khichdi like the shaak khichdi, meat khichdi, or khichdi with pulses are also quite popular among the locals. Sometimes they use snail meat in the khichdi, which is full of nutrition and health benefits.

However, depletion of natural resources due to degradation of forests and water bodies is wreaking havoc on the traditional eating habits of the tribal. Migration, both seasonal and for economic reasons

for sustenance and extra income, has further complicated the situation. As a result, their diverse food eating system is gradually disappearing, and the traditional knowledge of cooking is also losing its popularity. Now being weaned away from their traditional food habits, the tribal people might suffer from bad health and would become more vulnerable to diseases. The economic loss due to that would also be huge and would further complicate the situation in the days to come. An urgent intervention in this regard is the need of the hour. ■

Acknowledgement

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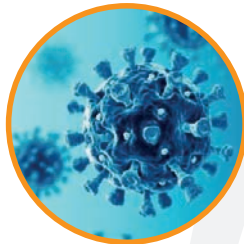
Photographs courtesy: Buddheswar Murmu, Assistant Community Media Producer, MANT

Train the Trainers Teachers Module 1

Positive Nutrition is the Right Answer



1 Leads to an overall healthy growth



3 Supports a strong immune system



5 Leads to stronger systems & organs



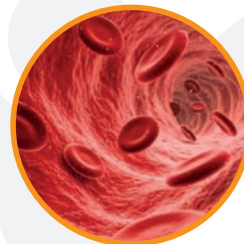
7 Maintains a healthy gut (microbiome)



2 Develops sharper brain & memory



4 Improves gross & fine motor skills



6 Reduces risk of lifestyle diseases

We are What We Eat

Our appearance & mood are dependent on what we eat.



Balanced diet leads to better physical health & mental wellbeing.

