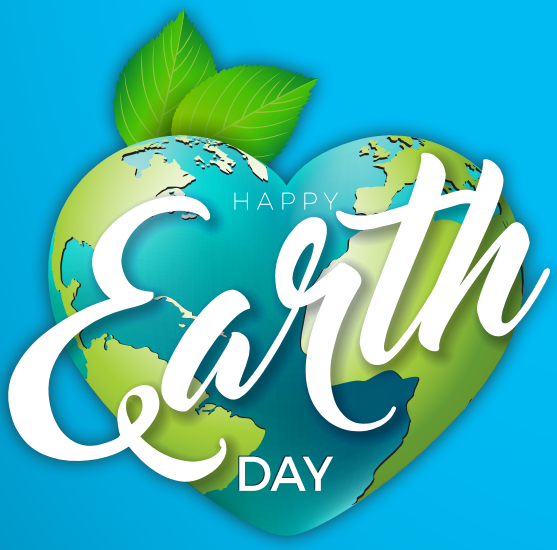
JK Policy Institute

Here's to Mother Earth... lots of love.

Our picks

JKPI's best on "Environment and Ecology"



22 APRIL

While a lot has been written in praise of Kashmir's breathtaking scenery, not much emphasis is accorded to the features responsible for its natural magnificence – its climate, the geography, and its interactions with the people, and vice versa. This is perhaps why this place has not attracted the kind of scholarship it should ideally have given its geological past – of being a place desiccated from water – of an ancient lake called Sati-Sara, or having been part of the Tethy's Ocean.

Even in global concerns vis-à-vis climate change, Kashmir rarely finds a mention. This is despite this region being situated within the world's highest mountain range – the Himalayas, which are vital to the global climate, and dictate and determine the human geography and political economy of billions not only in the Indian subcontinent but entire South Asia.

It is with this in mind that JKPI is trying to increase the knowledge and awareness of climate and environment issues and create a momentum for action.

Biopesticides for Environmental Safety and Sustainable Agriculture

Pesticides are used in agriculture, globally, to reduce yield losses and maintain pre/postharvest quality by eradicating unwanted insects and controlling disease and extending their shelf-life in order to keep pace with the growing demand for food. This extensive use of chemical pesticides has certainly provided protection to the crops. However, the practice has also raised concerns about pesticide residues in the food and environment.

In Kashmir valley, chemical pesticide use has reached a high. Human well-being and loss of productivity have, although, remained stagnant. Ignorance among less knowledgeable farmers has resulted in the indiscriminate application of pesticides. Studies have found that about 1/3rd of the pesticides used are spurious in nature. Chemical pesticides adversely affect beneficial organisms, leave harmful residues in food, feed, and fodder, and cause environmental pollution.

Food Crisis, Intensive Agriculture, and Environmental Issues

The Food and Agricultural Organization (FAO) of the United Nations forecasted the need to increase world food production by 70% in order to keep pace with the increasing demand for food. Maximizing food production is the primary objective of all nations, as the global population is expected to reach approximately 10 billion by 2050.

Thus, arose a need to produce more food from less per capita arable land and available water. But providing ample food was only the first part of the challenge. The second and more important challenge was to produce and protect them in a safe and sustainable manner. This is where intensive agriculture was deployed, using green revolution technology, characterized by the use of high-yielding varieties, chemical fertilizers, and pesticides.

There are an estimated 67,000 agricultural pest species that damage crops. However, due to the issue of pest resistance and withdrawal of some products on either regulatory or commercial grounds, only a few chemical pesticides are available in the market. Out of the 215 pesticides registered for use in India, 39 have been banned for use or withdrawn from the market. Thus, the requirement for the manufacture of even more pesticides has built up.

While the progress in agricultural production has been very impressive, intensive agriculture has resulted in several undesirable effects on the environment, and the overall sustainability of farming systems.

There are rising concerns about the loss of biodiversity and endangered species, set against the requirement to increase agricultural production without excessive reliance on chemical pesticides. Hence, the need of the day is to produce maximum from the decreasing availability of natural resources, without adversely affecting the environment.

Need for Biopesticides

Environmental safety and agricultural sustainability are equally important for survival on Earth. This is where biopesticides come into the picture.

Biopesticides or biological pesticides

refer to the use of living biological organisms or their metabolites for pests, pathogens, weeds, nematodes, rodents, etc. In accordance with the United Nations Food and Agriculture Organization standards, biopesticides are generally natural compounds or genetic modification agents, including biochemical pesticides (pheromones, hormones, plant regulators, insect growth regulators) and microbial pesticides (fungi, bacteria, or genetically modified microorganisms), which do not include antibiotic agricultural preparations. However, in the practical application of agricultural production, biopesticides generally refer to the large-scale industrial production of microbial pesticides.

Biopesticides are made from naturally occurring substances that control pests by non-toxic mechanisms and in an eco-friendly manner. Hence, biopesticides pose less threat to the environment and human health. They are generally less toxic than chemical pesticides, often target specific, have little or no residual effects, and have acceptability for use in organic farming.

Biopesticide Use and Management

Increasing demand for pesticide residue-free crop produce is one of the key drivers of the biopesticide market. Growing organic food market and easier registration than synthetic chemical pesticides are other important driving factors.

The development of biopesticides has largely followed a chemical pesticide model that does not fully exploit favorable biological properties of the biological agents. While there is commercial pressure from the manufacturing side to develop products, the environmentalists prefer narrow-spectrum products based on the strains from the area of use.

To reconcile these divergent demands, biopesticides in the market have been maintained at minimal negative impact, if any, on the environment. Increased public concerns about potential adverse environmental effects associated with the use of synthetic pesticides prompted the search for products based on natural resources.

One such innovation is the Integrated Crop Management (ICM) program. It is a pragmatic approach to maintaining an intricate balance between environmental safety and agricultural productivity with sustainability being an important factor.

Objectives of ICM are:

- Reducing external inputs, such as inorganic fertilizers, pesticides, and fuel by means of farm-produced substitutes.
- As complete replacement of these inputs is not possible without significant loss of yields, partial substitution of the inputs can be achieved by the use of natural resources.

In recent decades, the focus on crop production has shifted from yield to quality and safety. Evidence suggests that biopesticide is an important component for promoting sustainable agriculture, hence it has gained a lot of interest, particularly in view of the growing demand for organic foods.

On this note, let's also know some downsides of biopesticides:

- Slower rate of control, often a lower efficacy, and shorter persistence compared to conventional pesticides
- Greater susceptibility to adverse environmental conditions
- Greater level of knowledge required by the grower to use them effectively

Recommendations

Globally, there are 175 registered

biopesticide active ingredients and more than 700 products available in the market. The global biopesticide market has been valued at US $2.3 billion. It was expected to reach US $5.2 billion by 2020.

But there is still a lot to achieve in this regard, now of all times, when people are consciously leaning towards safety rather than yield.

- Identifying the ill effects of synthetic pesticides, most countries have amended their policies to ensure minimal use of chemical pesticides and promote the usage of biopesticides. However, biopesticides are still under the regulatory system originally developed for chemical pesticides. This creates a market entry barrier by imposing burdensome costs on the biopesticide industry.
- Biopesticides represent only 1% of the global market for agrochemicals. So, policy measures need to be strengthened in order to minimize the use of chemical pesticides and promote the use of biopesticides.
- There are certain technical difficulties in making biopesticides more effective and applicable. Generally, biopesticide application is not complicated, however, it may require training and knowledge about pests/pathogens against which they can be applied successfully.
- The other challenging task is to develop a balance between the broadly defined costs and benefits of biopesticides compared with synthetic pesticides.
- The new-found biopesticides may bring with them new regulatory and economic challenges that must be addressed jointly by the social and natural scientists, policymakers, and the industry.
- One other major obstacle in promoting biopesticides is the lack of profile which again reflects the weakness of the policy network. The relative immaturity of the policy network, lack of trust between regulators and producers, and limited resources and capabilities are some of the serious issues that need to be addressed.
- A better understanding of the mode of action of biopesticides, their effects, and regulatory issues that arise during their adoption may help to raise their profile among the public and policy-makers.

Future Prospects

As environmental safety is a global issue, there is a need to create awareness among the common people to switch over to biopesticides for their pest management requirements. Biopesticides are expected to provide predictable performance. Deployed properly, biopesticides have tremendous potential in bringing sustainability to agriculture and ensure environmental safety.

Wildfires: Are We Still Debating Whether Climate Change is Real?

Good intentions on paper mean nothing if not followed up with real and effective actions on the ground. These actions need to focus on forests, where the fire crisis is at its worst - Fran Price, Global leader for forests at WWF

The biggest challenge in protecting pristine forest ecosystems, apart from deforestation, is combating wildfires. It has been reported that the number of wildfire outbreaks around the globe increased by 13% in April 2019 as compared to previous years with 2020 hit even worse. Wildfires have been raging with ferocity, from the bustling Amazon to the lonely Arctic. Incidents of massive wildfires have been reported in Kashmir valley as well, unfortunately, that have increased in frequency since the past few years signaling the need for for an immediate and drastic response.

Australia was struck by an atrocious forest fire, and the propelled smoke reached upper parts of the atmosphere. Devastation could be seen from space. A multi-diverse domain consisting of temperate broadleaf and mixed forest biome was lost, and millions of hectares of land were rendered barren – devoid of cover.

Far west in California, firefighters battled some of the largest wildfires in recorded history. These fires were devastating, incessantly burning ecosystems and livelihoods of communities. In the winter of 2019-20, California only received half its normal levels of precipitation, suggesting the role of climate anomalies in increased incidences of wildfires.

With loss of forest cover in the first half of 2020 totalled at 307,000 hectares, which is 26% more than the same period in 2019, Brazil headed towards ruin. Deforestation is increasing rapidly and is likely to result in intense fires in this Amazon biome. Brazilian Amazon hit a 13-year high in June 2020. The Amazons were detected to receive 6,803 outbreaks of fires in July 2020, about 28% more than the same period in 2019.

With Himachal Pradesh, Kashmir and Assam bearing the brunt, India is faced with fire calamities on top of water shortages apparent from the past few decades. Baghjan, Assam is an example of human-driven accidental blowout of natural gas in an oil well causing massive fires. With devastating impact on environment in and around the nearby Dibru-Saikhowa National Park, mass evacuation of locals, deterioration in human health, and continuing fires in September 2020 – months after the fire began – Baghjan area has reduced to a desolate crater as opposed to the pristine ecosystem it once represented.

Kashmir valley also witnessed raging fires in 2021-22, particularly around the Dachigam National Park. Even though rescue teams and firefighters were sent to contain the blaze, a wealth of its ecosystem had been burnt to ground when the fire finally fizzed out. This is quite alarming, given the National Park is home to unique and diverse habitats, many of which are endangered.

Factors Responsible for Massive Wildfires

As per reports from World Wide Fund

for Nature (WWF) and the Boston Consulting Group (BCG), factors responsible for increased incidence of wildfires are persistent hotter and drier weather conditions induced due to climate change, land conversion for agriculture, and pathetic forest management.

Climate change reinforces wildfires.

This is proved by the fact that fires seen today in different regions of the world are larger, more intense, and last longer than they previously used to. Unprecedented is a frequently used word nowadays when it comes to fire severity, with climate change making outliers, i.e. abnormally long fire seasons, alarmingly unpredictable. Releasing millions of tons of carbon, destroying vital ecosystems, decimating biodiversity, threatening property and livelihoods, impacting economies and people, and causing severe long-term health problems for millions around the world are drastic outcomes of unprecedented wildfires.

Devastation is imminent. People, climate, and our planet will suffer if such wildfires continue. To cite an example, there are an estimated 340,000 premature deaths – every year – from respiratory and cardiovascular issues associated with wildfire smoke.

Estimates from Previous Decades

Based on global records from 2000 – 2015, 85% of the surface area burned each year is located in tropical savannas, making up 19% of the total land cover. Although forests constitute just about 10% of the total area burned, yet their higher carbon storage capacity holds responsibility for one-quarter of all fire-related carbon dioxide emissions. It has been observed that from 1979 to 2013, the global fire season length increased on an average by 19%. East Africa and Brazil usually undergo severe damages, with their forests and savannas experiencing an average of over one month increase in the fire season.

Forests and Negligent Human Pursuits

Human activity, intentional or otherwise, is estimated to be responsible for 75% of all wildfires in recent years. In the Northern Hemisphere, most fires are due to negligence, such as industrial accidents, burning rubbish and debris, and agricultural overspill. Arson is also to blame at times. In Europe, negligence causes 95% of fires, while in the US, 84% of fires are caused by the same.

Use of slash and burn techniques, especially in South-east Asia and Africa, controlled fires for clearing ground for palm oil plantations in Indonesia, and increased encroachment into public and Indigenous Peoples' lands in Brazil are some human interference that lead to huge uncontrollable wildfires. And unbearably in the end, wildland-urban interfaces suffer the most in the face of forest fires.

Kashmir, too, has been traumatized by unnecessary human interference. Hauling illegal timber, charcoal, as well as use of slash and burn, has been observed in the mixed forest ecosystem of our Valley, particularly in the upper reaches, where fire and rescue is even more difficult.

What Has To Be Done

Forests are treasures of nature. It may not be the first time you've read about protecting forests or sustainable cultivation but today the need to revise this information is more than ever.

1. With a young world population of nearly 2 billion, the requirement for preservation of biodiversity, both fauna and

flora, has exceeded prior commitments. It has given rise to a now or never situation. So, we need to raise climate change ambition worldwide, and improve the Paris Agreement accounting for emissions from non-anthropogenic (non human-driven) fires.

2. Halting deforestation, reinvesting in prevention, clarifying governance, coordinating policies, and using a science-based approach to risk assessment and intervention are some important ideas to consider while planning.

3. Bringing businesses on board while advertising the importance of forest ecosystems and the need for fire prevention is another important initiative that needs sufficient screen-time.

4. Wildfires are a global problem and need to be prioritized in public and health policy.

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Environmental Management is needed to address Environmental Impacts of Industries

Due to rapid growth in emerging economies like China and India, global GDP grew by 3.8% in the last couple years. This economic growth led to a rise in global energy demand of 2.1%, more than twice the rate as that in 2016. Fossil fuels being the main energy producers, global emissions rose again, by 1.1%, having been continuously increasing for the past 3 years.

The first instalment of the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report confirmed that impacts of climate change are increasing, largely driven by anthropogenic greenhouse gas (GHG) emissions. These emissions accumulate from developing new businesses, industries, hydroelectric plants, automobile factories, chemical manufacturers, and the lot. Every year that the global economy is unsuccessful in decarbonising at the required rate, the 2°C goal of the global carbon budget becomes even more difficult to achieve. Given the present scenario, the world is, unfortunately, on track to exceed the prescribed budget in only 30 years. To make matters worse, exposure of communities to severe weather, precarious forest fires, droughts, and other climate impacts is likely if emissions continue relentlessly.

Besides, improper management of chemical industries, which produce more than just CO2, has the potential to cause hazardous exposure to the local population and the environment. The Bhopal gas tragedy (1984) and Vizag gas leak (2020) are just some examples in this context. Malfunction of the cooling system, which regulated toxic chemicals present in the plants, was held responsible for these disasters. But the gases had been inhaled and it was too late to repent.

Business Advantages of Undertaking Environmental Management

To decelerate exploitation of the 'source and sink' structure, i.e. environment, management is the only way forward. In addition to bringing about a positive change in the surroundings, environmental management has a number of business advantages as well.

- Cost Savings: Though it may seem protecting the environment may cost a company more, the opposite actually stands true. By increasing process efficiency, modifying product design, regulating proper sourcing of raw materials and waste disposal, altering infrastructure layouts, and taking appropriate measures during packaging and transport, a company can save large sums of money.
- Reduction in Environmental Risk: By making sure assessment of environmental risks is, by and large, accurate, investors, banks and insurance agencies are more likely to commit to a company. Thus, standardized environmental assessment will go a long way to help a company in being decently insured.
- Meeting Supply Chain Requirements: With the world heading towards accountability in all sectors, suppliers are often required to provide evidence of their environmental policies. Therefore to gain a strong supplier foothold, a company is mandated to meet its set policies.

- Improved Public Image and Relations: Both for gaining a positive reputation among consumer base and regulatory authorities, environmental management is the way to go. It showcases a company's good faith in protecting and developing at the same time.
- Employee Benefits: Environmental protection is the new trend. A company preserving ecosystem rights administers enthusiasm in its employees. For they know, in some way or the other, they are doing their bit to save the planet.
- Ensuring Legislative Compliance: Avoiding public or media outrage by drafting sound environmental policies, while being aware of possible legislative changes, makes a company less susceptible to cash flow problems. Inculcating policies that cover all legal domains will cut down non-compliance fines for the company.

Guiding Principles for Environmental Management

Including social issues, related to human interaction with the environment, has always been a requirement in the management rules. However, application of the same has not been given much importance. Nevertheless, these rules can be rewritten to emphasize social issues related to environmental management. Some of these rules are:

1. Precautionary Principle: Here respect is given to peoples' way of life and integrity of their community. Mitigation measures are to be followed with certainty no matter the response from the community.

2. Uncertainty Principle: This principle pays attention to the fact that we don't fully know about social processes, and cannot comprehend these all the time, as these keep changing constantly from one place to another.

3. Intra-generational Equity: The interventions planned should not fall disproportionately on certain sections of the society like children and women, socially excluded and disabled or particular generations, more than the other.

4. Inter-generational Equity: The plans are to be made so that the needs of the present generation are met without compromising the ability of future generations to meet theirs.

5. Recognition and Preservation of Diversity: Every community has diverse societies, thriving in their own way. And they have been doing so for many generations. The plan needs to respect that and make sure diverse social setups are not compromised or diminished.

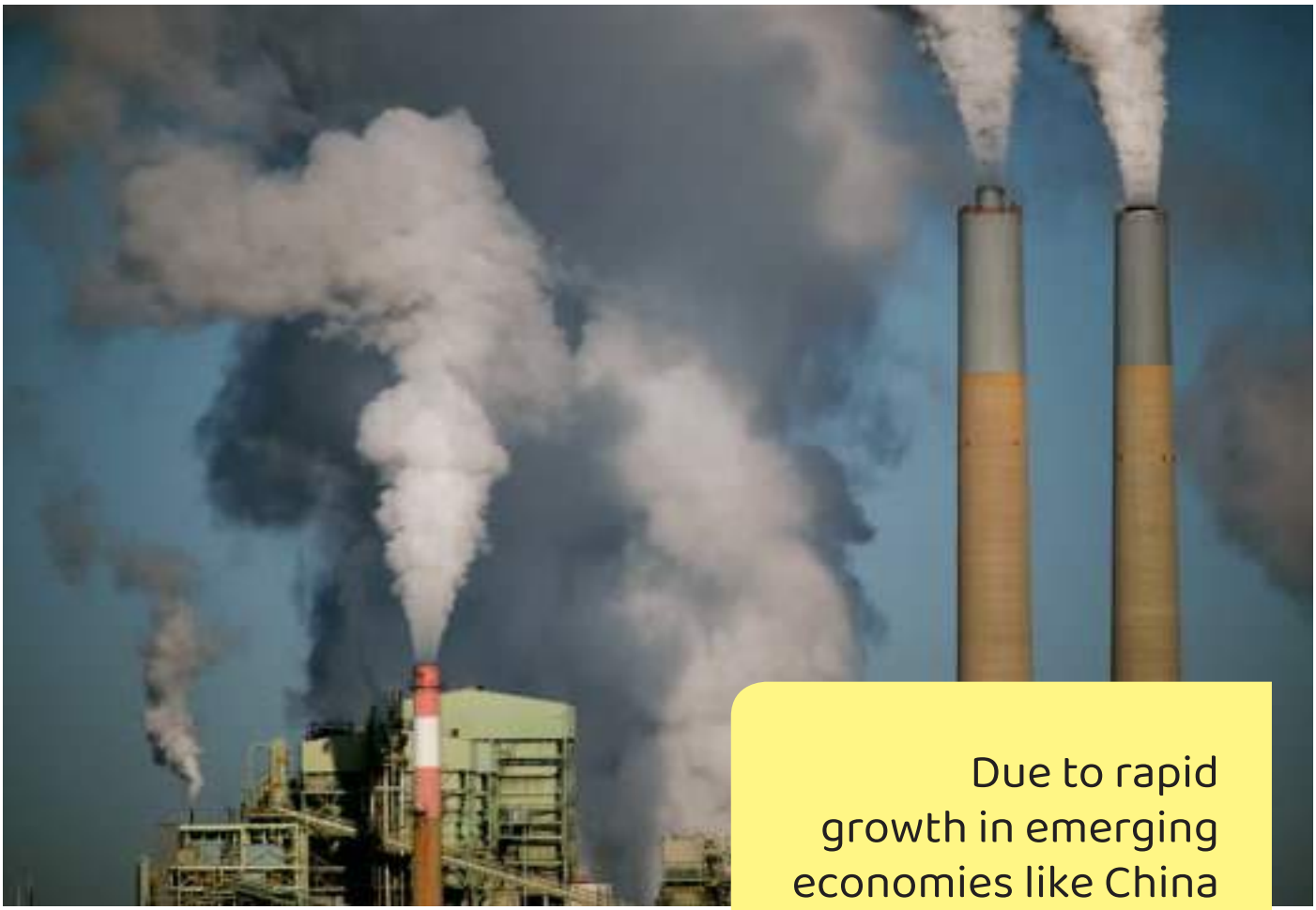
6. Internalization of Costs: All costs, ecological and social, must be included when drafting a policy. No plan should be approved until these costs are enclosed in the planning structure and deemed manageable.

7. The Prevention Principle: It is always preferable and cost-effective to plan properly beforehand than restore any social or ecological impact after the project is finished.

8. The Protection and Promotion of Health and Safety: The plans must necessarily take into consideration all health and safety protocols devised to prevent any untoward social or environmental impact on workers, locals, and future generations. This includes activities and impacts before, during and after completion of the project at hand.

9. The Principle of Multi-sectoral Integration: All policies, plans, and infrastructural programs should consider social needs and social development requirements.

10. The Principle of Subsidiarity: The whole planning and developing process should be decentralized, i.e. taking into



Due to rapid growth in emerging economies like China and India, global GDP grew by 3.8% in the last couple years. This economic growth led to a rise in global energy demand of 2.1%, more than twice the rate as that in 2016.

consideration the opinion of all stakeholders, especially people who are going to be most affected by the project.

11. The Polluter Pays Principle: It is a fundamental principle in US environmental law and a regional custom because of the support received by the majority of OECD (Organisation of Economic Co-operation and Development) and European Union countries. The principle demands that the whole cost of compensating for social impacts of a plan must be borne by the one who proposes the intervention. In simple terms, this principle states that as much as pollution is unavoidable, the industry or person responsible for it must pay some amount for restoration of the affected environment. It is mentioned in Principle 16 of the Rio Declaration on Environment and Development of 1992.

Environmental Management Tools and Techniques

Now that we have established that environmental management is important for any business to grow sustainably, another aspect to be appreciated is tools required for a business to effectively manage environmental and social affairs. The International Organisation for Standardization (ISO) in early 1990s recognized the need of introducing standardization in

the arena of environmental management. Thus, 1993 saw the birth of a committee that would write standards related to the following management tools:

1. Environmental Management System (EMS): It takes into consideration the company's techniques to manage environmental issues pertaining to its business. It also provides a way to methodically address all concerns on improvements related to environmental management. ISO 14001 and EMAS are required to be addressed in this EMS scheme.

2. Environmental Auditing: This tool focuses on the company's ability to deliver what it has legally accepted. Auditing makes sure the business is proceeding as per required standards.

3. Environmental Labeling: To make sure a product has the least environmental impact within the same product group, it is important to know about environmental labeling. Only 20-30% of products in a group fulfil the criteria set by a labeling scheme organiser. If a company wishes to obtain a label, it has to apply for it, and fulfil all criteria needed. If it does, then the product is certified as being one of the least harmful ones in a product category.

4. Life Cycle Assessment (LCA): This takes on the 'cradle to grave' approach. LCA determines the impact of a product from its inception to its expiration, assessing raw materials, energy used, and waste disposal in its wake. This tool is important for a company to boldly support claims about the environmental influence of its products. Also, it makes known when and where a firm should find cost-effective ways to reduce impact.

5. Environmental Indicators: These indicators are used to assess environmental performance and improvements that can be included to enhance operations in a company. It can also be used in firms without a developed EMS.

6. Environmental Policies: Drafting a policy is of utmost importance before undertaking any project. It signals commitment towards sound environmental management. It also makes sure that aims, objectives, and intentions of the company seamlessly converse with the environment.

7. Eco-balances: This tool is important to understand about a company's inputs, stocks, and outputs. It takes into consideration raw materials, energy, resources, products and wastes that enter and leave the company. This is to know about the business's overall impact so as to practise environmental management earnestly.

8. Environmental Reporting: To make known a company's methods and standards in reducing the environmental impact of its products, it may release the results for public viewing. Environmental reporting increases chances of a firm improving relations with various stakeholders and gaining a good image. All companies, large, medium or small, can find reporting a useful tool. An example in this context is CDPs (Carbon Disclosure Project) reporting for the world's principal publicly traded companies.

9. Environmental Charters: Subscribing to numerous charters or guidelines can enhance a company's image and showcase its commitment to responsible environmental management.

Environmental Management is essential to ensure effective strategies are implemented so that development, economic zenith, and environmental protection go hand in hand. Businesses must invest in constituting dependable environmental management systems for the benefit of both man and nature.

Kashmir's Karewas, Woedders, crumbling under urbanization

Kashmir is an oval-shaped basin with a plain area of nearly 5600 kms. The valley has large tracts of plateaus, the Karewas (one of the most valuable geomorphological assets of Kashmir); locally known as Woedders. These are similar to inter-mountain fills that comprise of unconsolidated gravel and mud. Geologists say that Karewas of Kashmir were formed during the Pleistocene period; a period that began about 2.6 million years ago and lasted until about 11,700 years ago. This was the time when the Valley was underwater, resembling a massive lake. When water drained out through Khadanyar (Baramulla), huge mud deposits were left during the process. These mud deposits solidified, and came to be known as Karewas; massive plateaus that are dry but highly fertile.

Quarrying the Fertile Karewas

The Karewas have a very old history and are known as geological and archaeological treasures of the Valley. These Woedders remain an unnoticed heritage of the region. They are so flat and massive that Srinagar International Airport is built on a similar plateau, in district Budgam, called the Karewa Damodar. However, now, due to massive urbanization, the Karewas are under severe threat. They are being razed to the ground, bulldozed.

Since the last 25 years, almost 20-30% of these geological formations have been plundered in Pulwama and Budgam. These pristine structures could have been developed as a tourist attraction, easily enticing enthusiastic archaeologists and geologists from the world over. But authorities did not grant the Karewas their rightful protection by declaring them as heritage sites. By allowing excavation of soil and clay from Karewas, the authorities paved a way for huge geological damage.

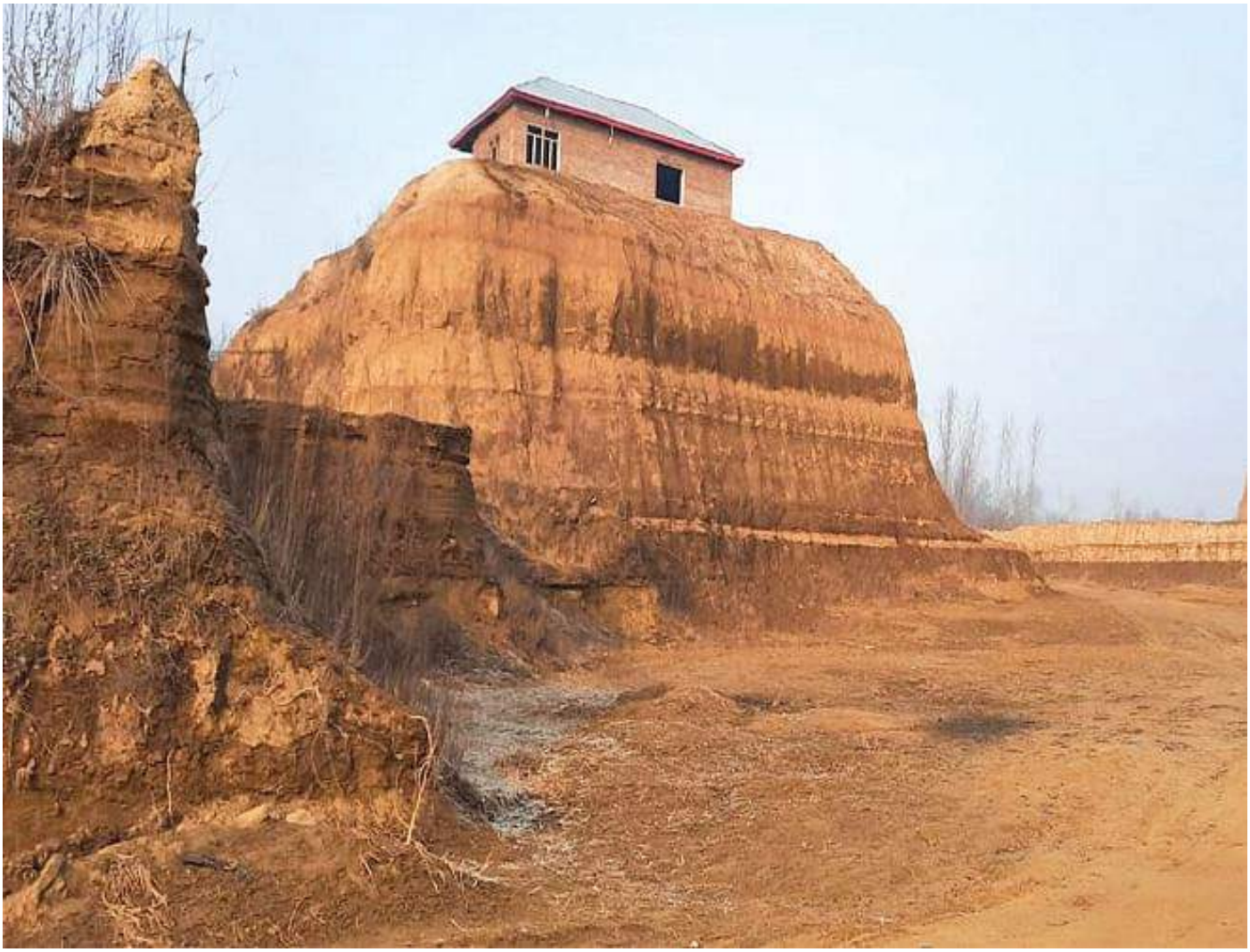
For the construction of Srinagar Ring Road, the government recently issued an order to excavate soil/clay from the Karewas of Pattan. Environmentally conscious residents of the Valley, including a local activist from Pattan, Hamid Rather held protests in Srinagar city against the move. Many suggested constructing this alternative highway around Srinagar city (Ring Road) from clay or soil displaced from the flood-spill channel, extending from Rambagh to Narbal. However, all efforts were in vain.

The Valley is bound to lose large tracts of Karewas in the next 2-3 years if alternative sites, like Wular embankments, or flood-spill channels, are not explored for clay excavation.

Fossils in the Karewas

Prof. Khurshid Ahmad Parray, in his research article, published in Current Science (Volume 100) explains that geological research has been carried out in various parts of Kashmir valley by several geologists since a very long time. The findings have revealed several fossils buried in the upper reaches of Budgam.

As per the studies undertaken by Godwin Austen (1864), it was reported that fish scales were found in Karewas of Gogjee Pathri, and upper mountain areas of Liddermud and Yusmarg. Reports by Patterson (1940) also revealed that a now-extinct elephant species, called Elephas hysudricus, was found in the Karewas of Pulwama and Budgam. The



article further states that fossils of Sivatherium giganteum (an extinct species of Giraffe) have been found in the Samboora Karewas near Pampore.

Noted geologist of Kashmir valley, Prof. Abdul Majid Bhat, has researched extensively on the Khonmoh fossil park, which is said to be a 252 million-year-old fossil site. He has also been raising concern on the destruction of Karewas, demanding that the government initiate the necessary legal framework to declare Karewas as heritage sites.

Flood Threats

Continuous soil excavation from the Karewas, and deforestation has led to extensive siltation of the Jhelum river, causing massive damage during floods. But no reported crackdowns have been attempted against soil excavators operating in broad daylight across several areas of Budgam, Pulwama and Pattan. Central Kashmir's Budgam district is mostly affected as excavation has been underway for more than two decades now. An estimated 30% of the Karewas in Khansahib, Budgam and Chadoora alone has been torn down by huge soil excavating machines and JCBs. Even in Gundchal Arwani of South Kashmir, demolition of the Karewas has been reported.

The Qazigund-Baramulla Railway Project

After the Qazigund-Baramulla railway project was started in Kashmir in the mid 90s, massive soil excavation work was taken up in Pattan, Pulwama and Budgam's Karewas. Hundreds of trucks, lorries, and carriers were pressed

into work by various construction firms which were given contracts to carry the clay/soil used for creating elevated railway tracks. The Karewas of Pulwama and Budgam became the direct target of plunder. It has been reported that the muck used for making elevated railway tracks from Qazigund to Baramulla contains 90% of the material obtained from the Karewas. A beautiful hillock at village Khanda in Chadoora Tehsil of Budgam was razed to the ground within a year or so during this process.

The Land of Saffron

Saffron cultivated on thousands of hectares of the Karewas, especially in Pampore, Samboora, Parigam, Wanpora, Kaisermulla, Sarai Khampora, Kuzweira, Kultreh and a number of other villages in Pulwama and Budgam, has been affected drastically. In Wadipora and Kultreh villages, the Karewas were vandalized by brick kilns as dozens of such kilns were set up in these areas. Clay from these Karewas was then used to make bricks. As a result, these beautiful plateaus are now defaced. In addition, Karewas around Ichgam, Ichkoot and Budibagh have been destroyed too. Many are apprehensive that Karewas of Budgam and Pulwama will further be destroyed now that work on Srinagar Semi Ring Road has already started.

Chadoora, Hyathpora and Nagam Karewas were once famous for quality almond orchards. But these, too, have been vandalized as demands for clay are increasing with each passing day. Farmers may be held responsible as well. Desiring to gain a good sum in exchange, many welcome construction firms to excavate their owned land.

The government is adamant in making the environmental impact assessment documents public. So, people are still unaware of the risk Karewas is under, or the kind of measures National Highway Authority of India (NHAI) will take to cause minimum environmental disaster.

Recommendations

The geomorphological local heritage of Kashmir, the Karewas, needs to be saved from destruction at all costs.

1. The government must immediately call upon the NHAI to ensure no soil excavation is done around Karewas during Srinagar Ring Road construction.

2. EIA and related documents explored before construction need to be made public.

3. It is imperative to explore soil excavation options from flood spill channels and Wular embankments. Places, such as these, need proper desiltation. This will, in turn, help save the rural/urban population during floods.

4. The muck or silt dredged from flood-spill channels and embankments might have moisture. However, the same may be dried and transported to various locations for use in construction.

5. The saffron lands need to be protected, with emphasis on disallowing construction of brick kilns on these fertile lands. Saffron is one of the backbones of the local economy. So, the authorities should place importance on its security.

6. With Kashmir's geologists endorsing protection of the Karewas, and these lands being home to quite a number of important fossils, the authorities must make a move to coronate the Woedders as heritage sites. Such a step would go a long way in supporting archaeological studies and tourism in the future.

7. All illegal dredging operations in and around these Karewas must be stopped if fertile lands need to be restored.

Here is why you should consider adopting a slow lifestyle.

Why on Earth are we trying to hurry? It is not good to be lazy or procrastinate, but what's required is slowing down. A slower lifestyle helps calm nerves, make deep personal connections, and, paradoxically, allows way more time than when we are frantically moving around.

One has to recognize that slowing down is a choice open to all. Even if you are busy, there are always ways to take it easy. You can start small and make your life fulfilling.

This slow-living phenomenon has roots in the Slow Food movement, started by Carlo Petrini in the 1980s, in Italy. Slow living rests on the simple idea of slowing down enough to enjoy life – from eating meals to the way of working to spending free time.

Reconsider commute

One way to embrace slowness and sustainability is by modifying or even doing away with a traditional commute. You could ride a bike or scooter – or even walk – to work instead of driving. Using public transportation instead of your own vehicle, or asking your supervisor about telecommuting a few days each week is a reasonable enough option.

Exploring other work opportunities – closer to home – if your current work situation requires a lengthy journey is another way to opt for a breather. Or if this isn't possible, you could always leave early to avoid traffic jams. Use your commute time to listen to a meditation recording, refreshing music, or audiobook for overcoming stress.

Spend free time on a hobby rather than on Google

Instead of checking email, continually updating social media, or even shopping online, spend your time on a hobby. These online activities can take up a lot of time if we let them! We're simply choosing to spend our free time online rather than doing something productive. It will help connect to yourself and increase productivity. Knit or play an instrument or write – devote one evening a week to what will help you slowly live through life.

A little boredom is okay

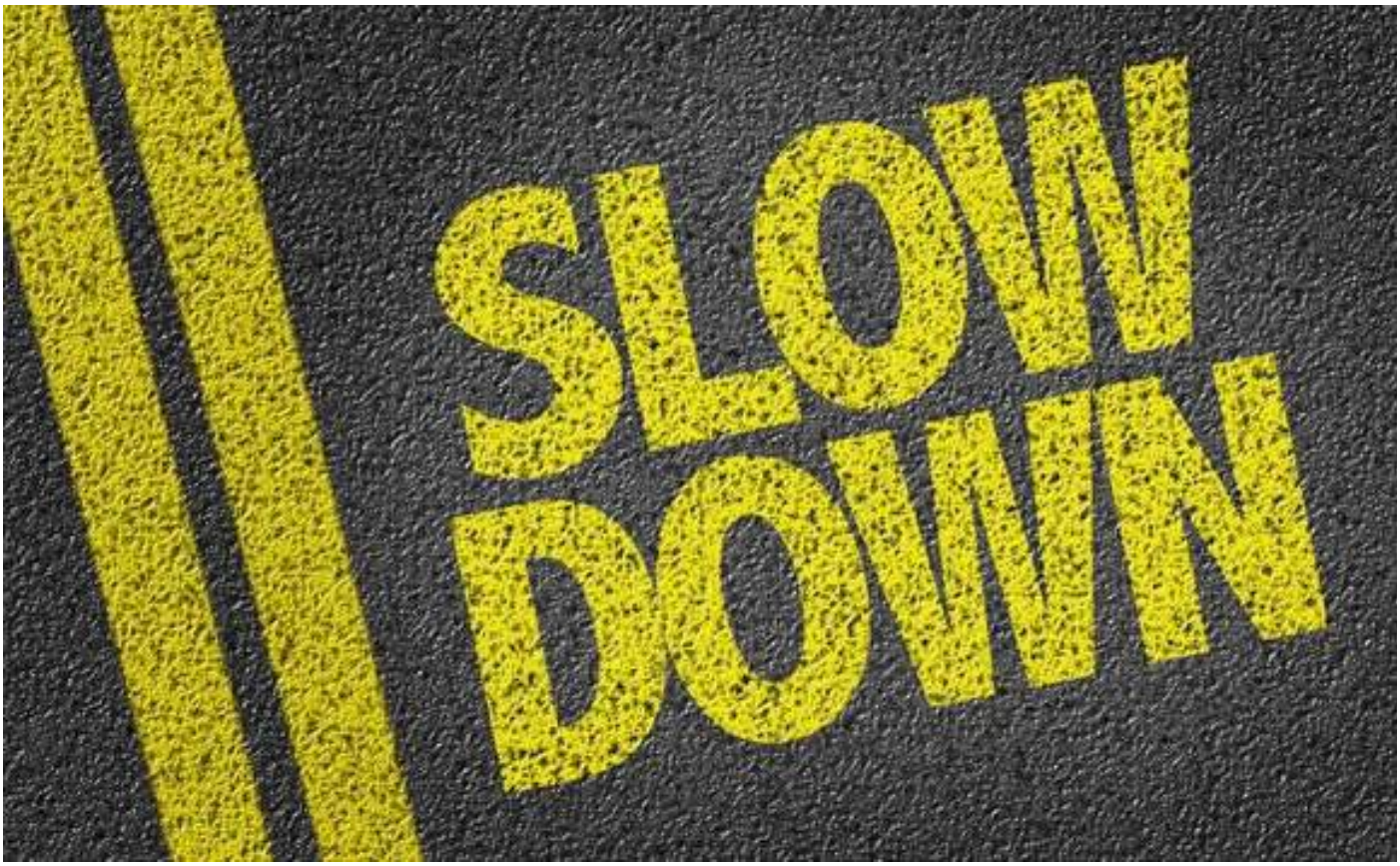
Thich Nhat Hanh – a spiritual leader and peace activist – writes in his book Planting Seeds, that it is actually quite difficult to be lazy.

"Not doing anything, just enjoying ourselves and whatever is around us, is a very deep practice. All of us have energy within that constantly pushes us to do this or that. We cannot sit or lie still and enjoy ourselves or the beautiful sky. If we aren't doing something, we can't stand it."

Choose to not always rush off into a new activity. Instead, pay close attention to the colour of the sky, your feelings, the people around you.

Slow parenting

Rushing from school to sports, to after-school activities, and then spending the remaining time on homework or looking at a screen, kids eventually get stressed out and run-down. The same is true for parents chauffeuring and catering



to them. Making room in the daily schedule for screen-free, unstructured time is very important to help everyone relax. Creative pursuits, such as using art supplies, woodblocks and building materials, and regular trips to the garden or exploring a nearby nature area will go a long way in helping you enjoy and relish life. At the same time, your kids might learn a thing or two about their environment.

Make from scratch

Making something you would normally buy brings satisfaction, costs very little, and can easily replace more typical and expensive forms of entertainment. It can be a collaborative activity, enough to include your family or friends, thus adding up to the memory drawer! Bake bread, brew coffee/tea, make jam, knit, try to create your own soap or scrub, or sew some cloth napkins.

Sharing reduces your ecological footprint

By spending with others, you share your footprint with theirs. At home with your family, being together in one room, cooking and eating together, or being entertained together, the amount of energy used is greatly reduced compared to when everyone is acting separately. This includes the energy consumed by cooling/heating, lighting, electronics, and cooking appliances. When people assemble, they merge their energy use.

Sustainability supports an individual's choice of slow living.

Voluntary simplicity – a practice where the focus is on having less but experiencing life more – is representative of sustainability.

The benefits of simple living are significant. Shedding the produce-and-consume way of life, you are able to focus more on aspects that support well-being like self-improvement, relationships, and pursuit of the meaning of life. You don't often get to experience such important parts of life in urban set-ups, given that

the hubbub of rushed life steals away most of your ‘me time’.

However, usually travelling to health resorts or countryside immediately has that soothing effect. You tend to appreciate simple living more. People from villages are mostly not aware of new technological advancements and continue living their lives in the lap of nature, taking their time, with no social media to overwhelm them. Thus, they invest energy in grooming their health and soul to the best of their capabilities. They are, in fact, way healthy than the city folk. Being with them and settling into their habits makes you more serene inside out!

Slow living promotes health and sustainability.

It encourages walking or cycling over automobiles. It promotes fresh local food over processed food. Sustainability assists in having warm, dry homes that ward off illness. It also supports the use of harmless natural products over synthetic ones.

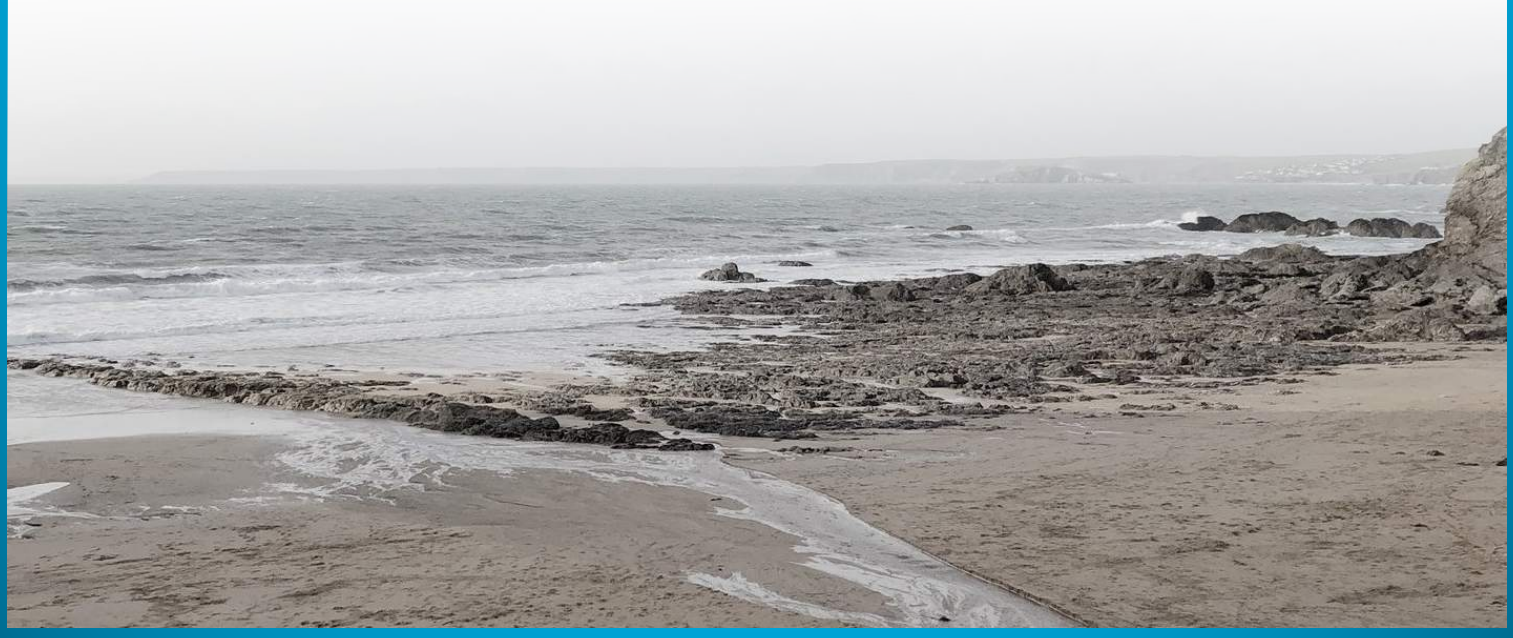
The whole society also benefits from slow living. If individuals are healthy, it will help make a robust society. Sustainable practices also include sharing, providing, and supporting each other – to achieve higher levels of social well-being in all communities.

Social consumption

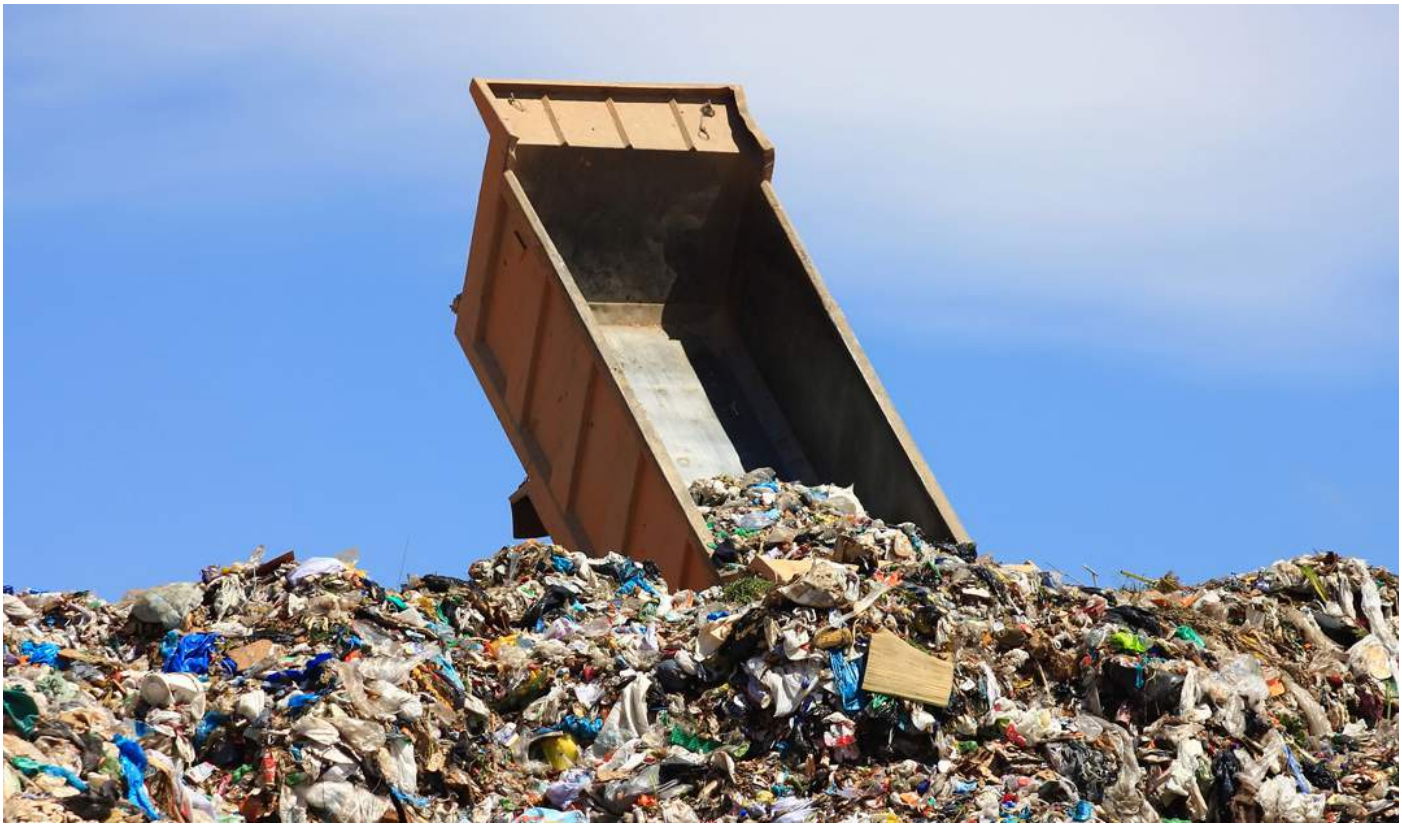
It not only helps you save energy but can increase your happiness too. Studies have shown that people are filled with positive energy when actively engaged in social, cultural, and creative experiences – more than if they are consuming mindless entertainment alone.

In-person interaction is not always easy. However, even just having a good conversation is more enjoyable than being alone. The major reason is that you’ve to put some effort into it.

With the pandemic switching our priorities, people have – even more so – realized the importance of social circles and human interactions that are not done over virtual networks. We must never forget the importance of human touch. Machines might replace the physical presence of human beings but they can never provide the same emotional closeness. Using these lessons as true mantras for a fulfilling life, we must act together, eat together, and spend time in each other’s company – to conserve energy, promote sustainability, and improve our living standards.



It's time to ask: when will Kashmir have proper waste disposal infrastructure



Waste generation has become a serious environmental and public health problem everywhere in the world, and disposal is as big a problem as is waste. India, alone, generates about 100,000 metric tonnes of solid waste per day. Likewise, waste generation in the Kashmir valley has increased tremendously in the past few decades. This is attributed to the rise in population. An exponential spike in population density has contributed to the over-utilization of resources – resulting in more residue. The population of Kashmir valley – as per the 2011 census – was 12,541,302, which represents 1.04% of the total population of India. The rapid population growth – though of value with respect to human resources – has led to over-consumption of the fixed ecological reservoir. And the footprint – carbon and otherwise – has escalated beyond what was considered to be normal.

Municipal Solid Waste (MSW)

As per Solid Waste Management Rules (2016), solid waste is categorized into municipal, industrial, agricultural and hazardous waste. Municipal Solid Waste (MSW) has the highest contribution towards total solid waste generated in India. This type of waste is produced on a daily basis within households, however, the majority of the houses have non-existent or inadequate disposal facilities. Kashmir is no exception with regards to improper MSW disposal practices.

Municipal solid waste generation per capita in India ranges from approximately 0.17 kg per person per day in small towns to nearly 0.62 kg per person per day in cities. The average composition of MSW produced by Indian cities is

approx. 40 wt.% inert, 41 wt.% organic, and with 19 wt.% potentially recyclable materials.

Segregation - Fundamental to Hygiene

Segregation forms the basic unit of waste disposal. We may even call it the standard unit or SI unit of waste disposal. It is through segregation that decomposable waste is separated from recyclable, and organic material is isolated from inorganic hazardous waste. Household waste consists of matter that can be used for compost. It also contains toxic hazardous waste, non-biodegradable waste, and at times construction and demolition waste. When standard procedures of segregation at source are followed, management of MSW becomes very easy. This is what is lacking in households.

People are not well aware of handling solid waste generated in homes and do not appreciate the importance of segregation of waste, and this ignorance has given rise to incorrect storage, transportation, and management of municipal waste in the Valley. Although the government has allocated dustbins for disposal of waste – both biodegradable and non-biodegradable – in almost all major townships of Kashmir, however, their proper use is still much of an enigma to most people. This leads to piling up of heaps of garbage – with foul odour – along roads or in fields, leading to an increase in the pest population, and the spread of diseases. Such sights are common in Kashmir nowadays.

What makes the problem – pertaining to waste separation – even worse is unorganized waste collection. The appointed waste collectors – using rickshaws, lorries and trucks – reportedly combine waste during the collection at the locality dump site rather than transport landfill-assigned waste and recyclable material separately. Separate vehicles are not provided nor compartmentalization of waste executed. And this leads to the bigger issue – the overflow of waste at landfills. Also, sanitary landfills in Kashmir are overflowing as they have far exceeded the maximum ecological and structural capacity.

As per estimates, the total waste generated in India is rich in organic matter – reusable and recoverable – than non-decomposable substances which are more suited for a landfill. Thus, the mixing of all kinds of waste material leads to the destruction of waste as a resource.

Waste as a resource

Waste-to-Energy (WTE) plants increase the probability of utilizing non-degradable, inorganic waste material as a form of energy. It is from this domain the concept of refuse derived fuels (RDF) originates. Some techniques to produce RDF include pelletization, incineration, and pyrolysis. For catering to biodegradable wastes, technologies like bio-methanation have been developed. Given the present rate of decline in resources and degradation of the environment, the development of a process for the successful utilization of waste as a resource has become a need of the hour.

Why sustainability?

Arcadis' Sustainable Cities Index ranks 100 cities around the world for their performance across three pillars. These are:

1. People (social): This pillar looks at the quality of life, assesses areas such as health, education and work-life balance.
2. Planet (environmental): This pillar looks at areas including energy consumption, renewable energy share, and green spaces.
3. Profit (economic): The economic

pillar examines the environment and economic health of the city. Sub-pillars in this category include ease of doing business, GDP per capita and connectivity.

Sustainable development is cleaner, has the potential to be efficient, and is the only way forward for a growing world economy. People misuse a lot of non-renewable resources. As the population increases, more resources will be required and faster will the reserves be depleted. Over time, sustainable development will no longer be an option for people. It will be the only available choice for everyone. It is simply a matter of time.

Recommendations

1. It is important to disseminate the necessary information among residents regarding waste segregation at source. A thorough understanding of waste disposal processes is needed to help people know waste and place it where it rightfully belongs.

2. Waste collectors, municipal officials and caretakers at landfills should be properly briefed about their duties.

3. As many as possible, separate vehicles for the transport of landfill-appropriate waste and biodegradable waste should be allotted.

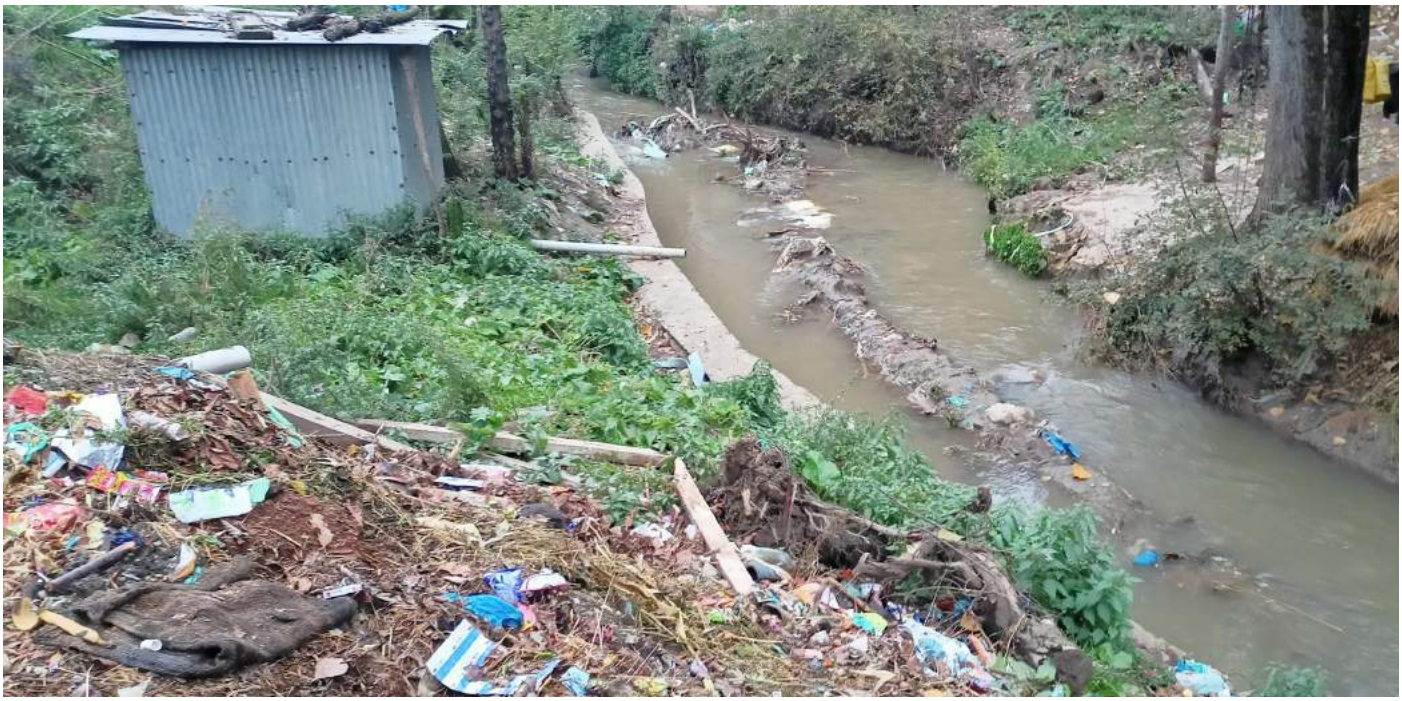
4. Need of the hour is the reduction in the generation of waste wherever possible – which gradually would prove advantageous in leading a healthy and sustainable life.

5. Sustainable resource utilization – even for waste – can be practised to decelerate irreversible changes in our biosphere.

Waste management forms one of the central pillars of the matrix of sustainable resource utilization. Resources we utilize are not something we inherited from our past but what we borrow from the future – remembering and following this piece of advice should be our ultimate goal. Kashmir, in general, and Srinagar, in particular as a smart city, is incomplete without proper waste disposal infrastructure.

The overwhelming crisis of waste management in Kashmir

"Thousands have lived without love, not one without water." - W.H. Auden



The overuse of local natural resources has, for the last two decades in rural village settings, contributed to environmental impacts like pollution, resource depletion, energy consumption, and waste. This has as much to do with changing lifestyles and population growth in villages as with failed policies and neglect at the state level.

The consumption of processed foods and packaged foods is also rising in villages, as a result, single-use plastic bags, plastics, polystyrene, polythene and other non-biodegradable materials find their way into the otherwise pristine streams and lakes.

During the past two decades, an unprecedented increase in the amount of solid waste and liquid waste was concomitant with the developing living patterns in villages. However, neither the government has announced any plans for waste management in villages nor are people ready to rise to the occasion. This negligence is unforgivable as it endangers the air, water, soil now and for future generations.

The streams, flowing through the agricultural landscapes of villages, which were once good and considered appropriate sources of drinking water, now are highly contaminated. The water of these streams nowadays is not even fit for irrigation, let alone for drinking as the solid waste generated by households is being dumped indiscriminately into water bodies.

Keeping in view these factors, the government is trying to make improvements in the tap water supply in rural areas of Kashmir to address drinking water needs at a larger scale and is also in the process of eliminating open defecation under the Swachh Bharat Mission. Nevertheless, these positive changes a) would bring disruptive shifts in the way

municipal waste is generated b) call for necessary steps to ensure the health of sensitive non-potable water sources is not compromised.

As of now, the wastewater management system -- a modern-day waste management practice -- is not present in the majority of rural areas in Kashmir as a result the untreated wastewater or liquid waste is directly discharged into local water bodies.

Waste management in rural areas

It is to be noted that the successive elected central governments have passed several laws to regulate the management of solid and liquid waste in India. These laws govern the management of solid and liquid waste generated by households and apartments, commercial establishments, industries, and institutions. For instance, under the Water Prevention and Control of Pollution act 1974, it is prohibited to pollute water bodies through wastewater or solid waste generated from households, industries or any other institution. Its motive is to prevent, control and abatement of water pollution and the maintenance of water.

With an objective to dispose of waste properly without any impact on the ecology of villages, the solid and liquid waste management (SLWM) program has been launched by the government. The program is supposed to set up a system for the scientific disposal of waste in such a way that it has a tangible impact on the population. The states have the duty to identify suitable technologies or methods to manage the liquid and solid waste generated from villages.

The funds allocated for the implementation of SLWM are provided on the basis of the total number of households, Rs 7 lakh for a gram panchayat having 150 households and Rs 20 lakh for more than 500 households. The rural development bodies in Kashmir have failed to achieve any progress vis-à-vis the Solid Liquid Waste Management (SLWM) programme as the government is yet to undertake the programme in the rural areas at the panchayat level.

According to a report, in the 4291 gram Panchayats of Jammu and Kashmir not a single scientific waste management practice has been implemented. Around 80% of the population of Jammu and Kashmir is living in rural areas but if compared with urban areas, only Rs 4 crore has been allocated for the waste management in rural areas, while Rs 464 crore was allocated to 91 urban local bodies in the 2019-20 budget.

Moreover, the funds allocated for waste management through Swachh Bharat Abhiyaan (G) remain unspent. As per SBM (G) guidelines, every state should have at least one SLWM consultant at the state level and one District Water and Sanitation Mission (DWSM) for every district to guide preparation for SLWM projects. However, the Department of Rural Development, which controls the Mission Directorate of SBM(G) failed to appoint consultants at the state and district level, the report said.

In the absence of waste management facilities, the villages are turning into dumping sites. Worst of all, the waste is being dumped on the banks of water bodies. Take an example of Ohangam village of central Kashmir Budgam district, where heaps of garbage is being dumped into a stream (Son-i-Muin Kul) beside hazardous household liquids are directly disposed into the stream. Two decades ago, people would use the water of the stream for drinking purposes. Now, it is just a trash site.

Similarly, in Ramhuma village of the same district heaps of garbage could be sighted on the bank of the Karshan

stream. The stream originates from the upper reaches of Tosamaidan areas where its water is pristine and clear. However, as it turns downwards it is being polluted with trash. It is pertinent to mention here that the Jal Shakti Department supplies drinking water from the same stream to different villages. In another village of Budgam called Brass where all waste including medical waste is being dumped in the famed Shukhnag stream.

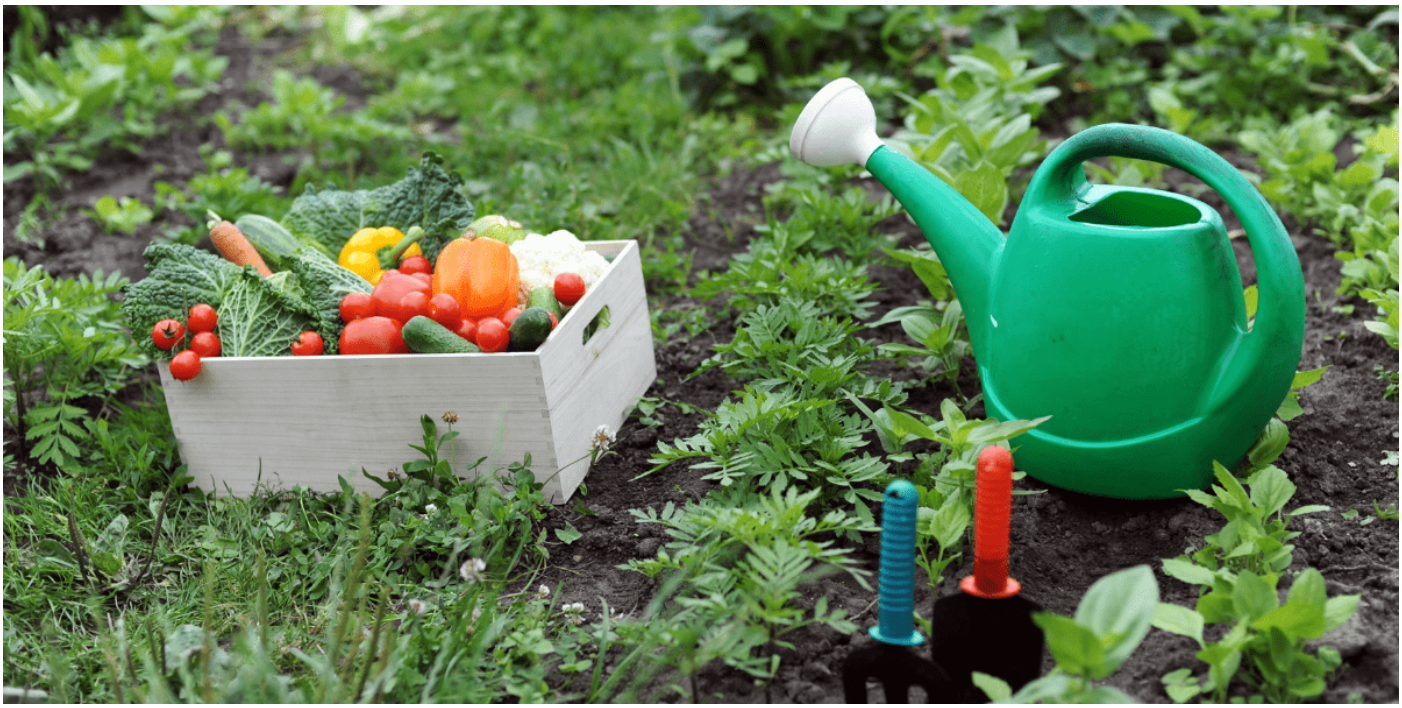
The Jal Shakti department is supplying water from a stream without any treatment to Sangrama village in district Budgam. The stream carries all the liquid and solid waste of the villages it passes through. The spot where the pipeline is connected is the same place where waste is being dumped.

The situation is much the same in most other villages where the major water quality impact affecting waterbodies is the discharge of untreated waste. For example, the majority of domestic and medical waste goes into Laam Nallah in south Kashmir's Tral village. It needs to be mentioned that medical waste makes the water more dangerous than the other waste that goes into the waterbodies.

A few recommendations regarding how to manage the untreated wastewater or liquid waste

- The SBM(G) should be focused on ensuring a community waste management system in villages. There should be no further delay in implementing the SLWM plans in the villages as it will have a negative impact on the fragile ecology and the environment of the villages.
- The government should raise awareness and hold campaigns to educate Panchayat representatives, villagers and Panchayat officials about the need and importance of Solid Liquid Waste Management.
- Government should encourage the construction of soak pits (a covered up chamber with perforated walls that helps percolate the treated wastewater into the ground) in villages.
- Modern sewage treatment plants or technology like Waste Stabilization Pond (WSP), Duck Based wastewater treatment, Phyto roid technology and Anaerobic decentralized wastewater treatment needs to be introduced in the villages as per the feasibility and need.
- Government should enforce plastic related laws strictly. It is high time to ban plastic material and find alternatives for it. Also, strict restrictions should be imposed on the final disposal of liquid waste.
- The government should constitute surveillance squads that can keep a check on illegal wastewater outlets and initiate action against violators disposing of solid and liquid waste into the water bodies.

Kitchen gardening: A culture model for environmentally sustainable food production



The agriculture sector in Jammu and Kashmir has always been at the mercy of uncertain weather, structural problems and lack of investment. However, a rapidly changing climate is making the sector even more vulnerable in the face of droughts and extreme weather. With changes in rainfall patterns, agriculture faces threats from both drought and flooding. These growing vulnerabilities can destroy crops and exacerbate the threat of food scarcity. The impacts of extreme weather events and shifting climates also mean that agricultural pests, that retard growth or kill plants, can now expand to areas where farmers hadn't previously dealt with them. They are expected to impact ecosystems as well, such as affecting pollinators, and natural predators that cater to pest control.

The bottom line is the following. Kashmir valley has a largely agrarian economy with a strong agricultural food sector, but every bit as vulnerable to unprecedented challenges that climate change poses.

Kitchen gardening offers low-cost and sustainable solutions, in harmony with the environment, to problems in the food system; threatened by climate change, mainly through the effects of predicted abiotic stresses.

The practice of setting up and maintaining a kitchen garden in Kashmir, locally known as Ve'ar, is as old as farming itself. Recognizing its importance at present, most people in Kashmir are tending to kitchen gardens, through experience and necessity. They have chosen to be self-reliant, especially at a time when it has become indispensable to grow food simply at home; in inhospitable climates. For many Kashmiris, especially women in rural areas, setting up and maintaining a kitchen garden has

become their way of life. Cultivating a kitchen garden in an environmentally friendly way not only offers respite from stress, but it has numerous ecological and financial benefits. Freedom from daily visits to markets to buy expensive vegetables is one such benefit. The most common vegetables grown in kitchen gardens in Kashmir are tomatoes, spinach, gourd, cucumbers, cauliflower, string and green beans, green chilli, potatoes, mint, bottle gourd, coriander, and the famous collard greens -haakh. The kitchen garden acts as a saviour; protecting people from pesticide exposure, and helping them meet their daily nutrient requirements. On top of this, the vast majority of food waste generated in households is efficiently managed and utilized as compost for the soil, fertilizing it naturally, in kitchen gardens. This results in less garbage in landfills and less resource consumption.

Climate change represents the greatest challenges to maintaining the sustainability of agricultural systems stressed by increasing food demands. Therefore, agrarian activities such as kitchen gardening that favour agricultural sustainability by bringing economic and environmental benefits merit further discussion.

By 2050, the world population is expected to increase to almost 10 billion. With 3.4 billion more mouths to feed and the dependence of the middle class on dairy and meat products in developing countries, global demand for food could possibly increase by 59%-98%. What this means is agriculture around the world needs to rev up production and increase yields. But scientists are of the opinion that impacts of climate change -- extreme weather, drought, higher temperatures, sea-level rise, and increasing levels of carbon dioxide -- threaten the quantity and quality of food supplies.

It has been well known that warmer temperatures may increase crop yields. However, the overall impact of climate change on agriculture is expected to be negative -- reduction in food supplies and increase in food prices. Many regions in the world suffer from high rates of hunger and food insecurity which include parts of sub-Saharan Africa and South Asia. These are predicted to experience the greatest declines in food production. And to top it off, elevated levels of atmospheric carbon dioxide (CO2) are expected to lower levels of iron, zinc, and other important nutrients in crops.

Floods wash away the fertile topsoil farms depend on for productivity, whereas droughts dry it out. Higher temperatures increase water needs and make crops more vulnerable during dry periods. Certain species of insects, weeds, and other pests benefit from this higher temperature and elevated CO2. It also increases their potential to damage crops, creating financial hardship for farmers.

With higher temperatures, most of our planet's glaciers have begun to recede. This is affecting farmers -- those who depend on glacial melt-water for irrigation. Meanwhile, rising sea levels compound flood dangers for coastal farmers. It also increases saltwater intrusion into coastal freshwater aquifers, thus making these water sources too salty for irrigation purposes.

In such scenarios, home-based gardens for food production will go a long way in pacifying, to some extent, the ever-increasing resource needs of most urban/rural lower and middle-class families in India. Apart from self-reliance, food security, thus, represents a significant factor in highlighting the importance of kitchen gardens in Kashmir. It encourages the idea of safeguarding our food production by being sustainable in approach and mindful in waste generation. People who cultivate crops and

raise cattle; know their environment very well. Even though many among them might still be unsure or ignorant about scientific developments in crop production, yet they have an established sense of preservation. And in doing so, they act as front-runners in the race to save our planet. Self-sustainability is one of the main attributes of people with the least ecological footprint.

Recommendations

Our challenge is not to dismantle our current system of food production, but to help it evolve. And to better protect and promote public health, preserve natural resources, and improve food production and quality. No one-size-fits-all approach can help achieve these goals, given the complexity and dynamic nature of agriculture and our food system as a whole. Instead, a range of evidence-based approaches is needed. Approaches combining traditional wisdom with current science to ensure a sustainable, healthy, and equitable food system for everyone, at all times.

Therefore:

1. Cultivating a kitchen garden must become a sense of pride and accomplishment for every Kashmiri. It should not be perceived as unsophisticated or retrograde. Simply put, in this day and age, whilst examining the current world scenario, it represents the optimal way to overcome food scarcity.

2. Brainstorming for projects to maximize food production and reduce crop loss by adequately predicting and managing flood and drought risk should be encouraged by all concerned departments/ research centers/educational institutes.

3. Improving financial practices and helping farmers explore new schemes for sustainable food production should be considered. These schemes can be extended to farming at home, strengthening the concept of kitchen gardening in Kashmir. Motivating people towards growing their own food and providing them incentives to help wherever possible is a must.

4. Before a food crisis unfolds, the need for relief efforts must be identified.

5. State-of-the-art climate information and prediction tools to be introduced.

6. Building quantitative economic models to examine vulnerabilities in our food system under different scenarios. This can be used to explore how changing certain policies might reduce vulnerabilities of the food system to disruptions.

Being strong in body and mind, acting resolutely, and adapting to survive makes us humans apex predators in the global food chain, and also the ones responsible for protecting it. Kitchen gardening will make us sustainable and independent for daily necessities. It highlights the basic human attributes we still share with our prehistoric ancestors today -- our will to survive, even in turmoil.

CONTRIBUTORS: ADEELA HAMEED AND MUKHTAR DAR | **SUPERVISION:** JAVAID TRALI
EDITOR: AKEEL RASHID | **DESIGN:** TANVEER LONE
Website: www.jkpi.org | Sector 5, Bemina, Srinagar, Jammu and Kashmir, India, 190018