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Celebrating 25 Years of Action for Biodiversity

International Day for Biodiversity 22 May 2018

Executive Secretary of the Convention on Biological Diversity, UN Assistant Secretary-General,
Dr. Cristiana Paşca Palmer

25 YEARS AGO, in December 1993, the Convention on Biological Diversity entered into force. It was the realisation of a project for sustainable development that had taken the world decades to achieve.

Since 1993, Parties to the Convention have undertaken actions to conserve biological diversity, use it sustainably, and equitably share the benefits from the use of genetic resources. They have developed partnerships with civil society, business, indigenous peoples and local communities and other actors.

This has made a difference. Biodiversity and its ecosystem services are at the heart of the 2030 Sustainable Development Agenda. The Paris Climate Agreement includes biodiversity. The World Economic Forum recognises biodiversity loss as a critical risk. The Food and Agriculture Organization has organised focal work on Biodiversity. Paris has declared itself the capital of biodiversity, and all the way around the world, countries, local governments and civil society are stepping up their actions to safeguard biodiversity.

But on the other hand biodiversity continues to decline in every region of the world at alarming rates. This loss of nature compounds other global challenges such as climate change, water security, food security, and public health and can potentially lead to catastrophic outcomes for human existence on this planet.

It is therefore, imperative to do everything in our power to halt the destruction of nature.

We have two more years to go to redouble our efforts to implement the Strategic Plan for Biodiversity 2011-2020 and to make progress in achieving the global

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Director-General of United Nations Educational, Scientific and Cultural Organisation (UNESCO),
Audrey Azoulay

BIODIVERSITY IS a common good, an invaluable legacy formed over the course of millions of years, and capital to transmit to future generations. In its definition, it includes the exceptional variety of the forms of life on Earth, as well as the natural environments where these forms developed – the ecosystems. Biodiversity is central to our own existence, offering all nature's resources to our development.

Biodiversity, however, is not inexhaustible. Human interventions – extensive exploitation of resources, unsustainable patterns of consumption, industrial pollution causing climate change – are resulting in irreparable damage to biodiversity.

This was highlighted by international experts at the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which met last March in Medellin, Colombia. The reports produced by these experts confirmed the rapid deterioration in the state of biodiversity and underlined the direct effects of this deterioration, which are already visible, such as the spread of certain diseases to men.

UNESCO, a partner agency of IPBES, pledges to work towards halting the loss of biodiversity and fostering the sustainable use of ecosystems. The Programme on Man and the Biosphere (MAB), for example, aims to ensure a harmonious balance between human activities and the natural environment. In the context of the United Nations Decade on Biodiversity (2011-2020), UNESCO is also contributing actively to the implementation of the Convention on Biological Diversity, adopted 25 years ago by 196 parties and aimed at the conservation of biological diversity and a sustainable and equitable sharing of

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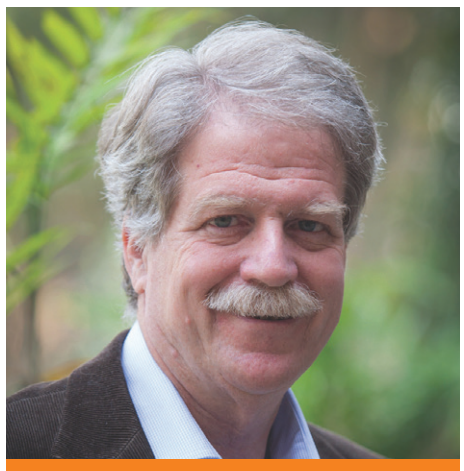

Director General of the International Centre for Integrated Mountain Development (ICIMOD)
Dr. David James Molden

THIS YEAR marks the 25th anniversary of the Convention on Biological Diversity (CBD), and this year's International Day for Biological Diversity (IDB) is focused on "Celebrating 25 Years of Action for Biodiversity."

In the past twenty-five years, global environmental governance mechanisms such as the CBD have helped countries in the Hindu Kush Himalaya (HKH) sustain mountain biodiversity. Although meeting the CBD's national and global targets is a tremendous challenge, this IBD is an opportunity for us to reflect on what we might count as our major achievements and what we have yet to do.

The HKH is home to 240 million people and provides water through its river basins to 1.9 billion people, a quarter of the world's population. It contains the Himalaya, the Indo-Burma, the mountains of southeast China, and the mountains of central Asia. These are traditionally connected cross-border biological hotspots that support livelihoods and provide food security for three billion people, among whom are some of the world's poorest and most disadvantaged.

A respect for the variety of life in the HKH and a focus on its people informs all of ICIMOD's work. This is particularly evident in our initiatives under the Transboundary Landscapes Regional Programme. Through a range of partners, these initiatives have filled data gaps, established long-term environmental and socio-ecological monitoring, tested biodiversity conservation models, built human and institutional capacities, influenced national biodiversity conservation strategies, and pushed the uptake of evidence in national and global fora to effect inclu-

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Country Representative of International Union for Conservation of Nature (IUCN) Pakistan,
Mahmood Akhtar Cheema

THE INTERNATIONAL Day for Biological Diversity Day is being celebrated today all over the world to mark the importance of Biological Diversity on this earth. The theme for the year 2018 is "Celebrating 25 Years of Action for Biodiversity" stresses on the actions taken at the national and international levels for conserving the Biodiversity.

Pakistan is bestowed with abundant natural resources starting from Himalayan glaciers, lush green plains, fascinating wilderness to golden-sand beaches along its coasts. Pakistan is also a rare country that hosts 10 agro-ecological zones.

Since it established its offices in Pakistan, IUCN Pakistan has been instrumental in facilitating the federal government in realizing its international commitments. The most recent example is the declaration of the first Marine Protected Area of Pakistan – Astola Island. IUCN Pakistan facilitated the process of bringing together all the stakeholders that included: the Ministry of Pakistan; Government of Balochistan; Pakistan Navy; National Institute of Oceanography; WWF-Pakistan; Indus Earth Trust; and Sindh Forest and Wildlife Department.

Another recent example is development of the National Action Programme to Combat Desertification in Pakistan - a task for aligning the National Action Programme (NAP) with the 10-year strategy of the United Nations Convention to Combat Desertification. The process of developing NAP was led by IUCN Pakistan which involved engaging key stakeholders at the federal and provincial levels. IUCN has also been instrumental in developing the Pakistan National and Provincial Biodiversity Strategies and Action Plans

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Siraj Khan

Threats to the ecosystem of Pakistan and endangered species

Pakistan has one of the most diverse landscapes on Earth, from 0 m at sea level to 8,611 m at the peak of K2. We are blessed with a wide range of biodiversity and ecosystems. Pakistan is hosting a collection of .....

Threats to the ecosystem of Pakistan and endangered species

Siraj Khan

Pakistan has one of the most diverse landscapes on Earth, from 0 m at sea level to 8,611 m at the peak of K2. We are blessed with a wide range of biodiversity and ecosystems. Pakistan is hosting a collection of unique ecosystems like Baluchistan Juniper Forests, Chilghoza Forests, Baluchistan Subtropical Forests, Sub-Tropical Deciduous Forests, Himalayan Dry and Moist Temperate Forests, Trans-Himalayan Plateau, Thorn Forest, The Baluchistan Desert Basin, The Thar Desert, Indus Delta Mangrove.

The variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. A rise in population coupled with the demand for economic growth is putting ever-increasing pressures on the country's natural resource base.

Wrong economic policies have led to the widening of inequalities, forcing the poor to depend more heavily on natural resources. Lack of facilities, such as adequate electric supply and natural gas in the rural areas, has resulted in the exploitation of fuel wood at an unsustainable rate. The result: Due to these listed and several other threats large number of species are threatened and some are now extinct from the country i.e. Overpopulation, Urbanization, Water pollution, Water shortage, Over hunting, Habitat degradation, Invasive, Climate changes, Floods, Earthquakes, Deglaciation, Deforestation, War Against terrorism.

Conservation and preservation of environmental quality is the cry of the day, one must follow the rules of conservation. Habitat loss is at its peak so it needs to be addressed, creation of awareness and provision of incentives to local people, marketing policies should pragmatic, rehabilitation of degraded habitats, reforestation should be encouraged. Endangered is the second most severe conservation status for wild populations in the IUCN's schema after Critically Endangered (CR).

The war is playing a major role in destroying the biodiversity of Pakistan. Numbers of people lost their lives, the majority of the forests has been destroyed and the timber has been cut and sold both in the country and in the neighboring countries, many of the insects like bees are migrating from the areas of war. Conservation of natural resources is a serious issue and a hot debate of the day around the globe.

Once a species becomes extinct, that combination of gene pool is permanently lost and man no more can recover it for future use. There is an extinction of species due to selective and excessive exploitation, lack of proper management practices for their regeneration and the destruction of certain natural ecosystems. Each disappearing species takes with it other dependent species of insects or higher animals.

Another factor contributing to the damage of forests is shifting agriculture. People are by and large poor and their living status is much below subsistence level. Land suitable for agriculture is limited, yields are low and their means of earning, other than agriculture and livestock husbandry, are scarce. People are, therefore, tempted to clear forests and burn trees to develop land for cultivation and to graze animals in forests to earn their living. All of these actions are a result of poverty and subsistence living.

The second type of damage is caused by a section of society who is notorious and habitual forest offenders. They indulge in illicit cutting of trees and un-authorized transport of wood to earn easy money while bribing law enforcement agencies in the process. Some forest contractors and influential local politicians are included in this group and they manage to inflict damage on forests with impunity.

To control damage of this type, sale of standing trees to forest contractors has been stopped. Harvests of forests are now carried out through semi-autonomous organizations like the Forest Development Corporation (FDC) in NWFP. Another step taken to reduce illicit damage at the hands of habitual offenders is the deployment of armed personnel of the Frontier Constabulary (Civil Armed Force) who are permanently stationed at vulnerable places in the interior and at less frequented routes and exit points. Some sections of the same force are also patrolling the areas and are on constant move. Due to these two actions, forest damage by habitual offenders is now manageable.

Protection of forests is a serious problem in Pakistan. Most of the damage is done directly or indirectly by people living inside and in the vicinity of forests who depend on them for their fuelwood, timber and grazing needs. Often, these people consider forests as a common property. Traditional management systems are breaking down under the pressure of poverty and mounting human and cattle population. This is resulting in greater incidence of illicit damage.

Pakistan has faced significantly high rates of deforestation in the past hundred years from 1880 to 1980 where the forest area was decreased from 1, 41,530 square km to 67,310 square km., while the most recent deforestation rate was 55,000 ha from 1990 to 1995 at the rate of 1.1 % per annum (FAO 1989). The disappearing forests take with it other dependent herbaceous plant species as well as insects and other animals.

Genetic biodiversity of traditional medicinal herbs and plants is continuously under the threat of extinction as a result of growth-exploitation, environment unfriendly harvesting techniques, loss of growth habitats and unmonitored trade of medicinal plants. Medicinal plants availability has been decreased considerably during the past two decades. The aged people during interview narrated that medicinal plants were abundant in the vicinities of human settlements some 20 years back.

However, the population of medicinal plants drastically decreased due to increased marketing pressure on medicinal plants, lack of job opportunities in the area and non-sustainable Harvesting methods. Anyone lost in the wild knows that nature wants you dead. Co-operating with nature learning the truths of nature and getting energy from nature.

Nature wants our love and respect!

The author is from Department of Botany, Abdulwali Khan University, Mardan, Pakistan.

From page 1: Message of Dr. Cristiana Pașca Palmer, ED CBD

Biodiversity Targets, also known as Aichi Biodiversity Targets. We have two years to design a new deal for nature that will take us from 2020 to the middle of this century and help achieve the collective vision of living in harmony with nature by 2050.

We don't have much time. But we have a lot of power if we work together, in a collaborative manner to change the way we use nature and biodiversity. Indeed, we need a transformative approach and a systemic one that will allow governments, businesses, indigenous peoples and local communities and individuals to foster a paradigm change in the way we interact with nature and biodiversity.

Let innovation and creativity inspire our solutions and practical ideas to safeguard life on earth.

Let us harness the energy of idea to create the conditions for humans to thrive and develop in harmony with nature by 2050.

Let us boldly take the first steps of the next 25 years of history to realize this dream. Happy International Day for Biodiversity.

From page 1: Message of Dr. Audrey Azoulay, DG UNESCO

resources. At sites on its World Heritage List, in its World Network of Biosphere Reserves and its Global Geoparks, our Organization develops, with all its partners, innovative solutions by addressing issues of biodiversity and cultural diversity in a complementary manner.

Beyond the urgent need to preserve biodiversity and restore degraded ecosystems, these programmes are helping to change attitudes and develop economic and social practices. This falls within the 2030 Agenda for Sustainable Development, in particular Sustainable Development Goal (SDG) 15, dedicated to the quality of life on Earth, and requires the sharing of values such as cooperation, respect for diversity, and intergenerational solidarity, values acquired and cultivated through education for sustainable development (ESD).

This International Day aims to raise awareness of these issues that are crucial to our lives today and in the future. On this Day, a beautiful American Indian proverb is particularly fitting: "We do not inherit the Earth from our ancestors; we borrow it from our children."

Saikat Kumar Basu

Zoo gardens as window of exploration, education and knowledge for the public

Zoological gardens or zoo gardens has a nostalgic connection to most of our lives. There are hardly any kids these days where the family has not made stop at the zoo for exploring the vibrant and divergent animal life .....

Zoo gardens as window of exploration, education and knowledge for the public

Saikat Kumar Basu

Zoos have travelled a long distance from the traditional agenda as showbiz into nature-based education hub for the public to explore and educate themselves about nature, wildlife and biodiversity; and the value of natural world in our social and economic life

Zoological gardens or zoo gardens has a nostalgic connection to most of our lives. There are hardly any kids these days where the family has not made stop at the zoo for exploring the vibrant and divergent animal life at some point of his/her life. Zoos have strong impacts on all school going kids in knowing about mysterious animal life and behavior; and also, to appreciate the diversity of our natural world. Several schools shave programs to take students to the zoos to introduce them to the spectacular diversity of animal life, to connect the kids to the natural world outside the four walls of the classroom in a practical nature-based laboratory as well as an eye opener with opportunities of supervised exploration and gathering knowledge about our diverse natural world. Several countries include visit to zoos with various objectives at the primary, secondary and tertiary levels of education. The basic idea however is the same; and that is to respect and appreciate the diversity of life that we often forget in the din and bustle of our busy daily life.

Private zoos across different continents were in fact first established by the existing monarchy of the land, aristocrats, noblemen, influential courtesans and rich social elites as a part of their proud and exquisite collection of wild animals, birds and reptiles. Hence credit must be given to the monarchy and other elites of the society in establishing and maintaining the first of its kind of private zoos. With democratic reforms hitting various societies; private zoos slowly transformed into public zoos keeping in pace with the evolution of human social history and the rise and popularity of democratic values. When the need and importance of modern electorate and ordinary citizens started getting recognized; private zoos slowly started transforming into public zoos.

The process was initiated in Europe and then spread to the rest of the world over time during the post colonial era. Many of these zoos were stocked with animals from different continents either by explorers and travelers or through armed campaigns during pre-colonial era; and through army personnel, adventurers, explorers, hunters and researchers during the colonial and post colonial period. The collection of live and dead animals and birds from distant continents thus started rapidly filling in the shelves and galleries of natural history museums and cages of the zoos respectively. Such global collections enriched premier zoos with spectacular diversity of life from around the planet during the classical age of exploration, adventurism and post-industrial revolution era.

However, it is important to remember that most zoos however started with a single point agenda; and that has been entertainment of the public primarily. The display of animals in the age old conventional or traditional zoos have been guided by the notion of capturing the interest of the public, to provide visiting families with an opportunity to have an enjoyable or memorable day out with their kids watching spectacular wildlife outside the confines of their homes without having the trouble to visit natural ecosystems or forests in far off lands and continents.

Zoo management has been at its infancy with very little or almost no proper care for the animals housed in congested and over crowded cages. Appropriate veterinary diagnostics and treatments as well as modern vet medications were not available for the inmates. Many precious animals, birds and reptiles died during transportation and due to lack of suitable care, proper diet and nutrition or any facilities for modern animal care. Furthermore, unhygienic condition of the cages, cross contamination, injury and diseases also took a number of animal lives in the traditional zoos of the past.

But out of this chaos and confusion, modern zoo gardens got their basic foundation laid and established over few centuries to transform into world class public zoos from their initial humble beginning as private zoos for the aristocrats. Today, modern zoos around the world have evolved into different specialized forms such as zoological parks or gardens, fresh water and marine aquariums, eco parks, animal theme parks, vivarium, reptile houses, snake parks, animal laboratories for study of animal physiology and animal behavior, aviaries, animal nurseries and hatcheries, nature interpretation centers, animal rescue and rehabilitation centers, butterfly gardens, insect gardens, open air zoo, captive breeding centers, animal education and interpretation centers to mention only a handful.

The zoos and aquariums around the world are now governed by the World Association of Zoos and Aquariums (WAZA). The Padmaja Naidu Himalayan Zoological Park in Darjeeling, West Bengal is a member of WAZA. Otherwise, nodal central administrative units in individual country like the Central Zoo Authority (CZA) in India manage the zoo at the national level; following stringent international guidelines, protocol and procedures for zoos across the country. Zoo management has reached a new height now across the globe with respect to the management of zoo animals like housing them in artificial natural habitat like enclosures, better treatment for animals under captivity, zoo based breeding, modern veterinary treatment for sick or injured animals, catering to animal specific diet and nutrition, paying special attention to research on zoo animal physiology and behavior; and attempting to make zoo as an effective and efficient tool for public education and awareness rather than simple entertainment as in the past.

Zoos around the planet have now developed more into education and interpretation centers for wildlife, human-animal interaction platform; and for showcasing the spectacular global biodiversity. Zoos have travelled a long distance from the traditional agenda as showbiz into nature-based education hub for the public to explore and educate themselves about nature, wildlife and biodiversity; and the value of natural world in our social and economic life. Such institutions and organizations have big funding with support from the government and public to conduct captive breeding for many endangered species to be able to replenish the natural ecosystems which they represent. The evolution of modern zoos from their traditional humble beginning is an inspirational story in itself. They have slowly undergone transformation from exhibitionism into knowledge centers with high focus on conservation.

M. Umair Yasin

Adaptation of crops in changing climate

It may be defined as it is aggregate form of weather that present long term on a specific place and specific over the period of time is called climate. It is a natural phenomenon that affects the human as well as crop .....

Adaptation of crops in changing climate

Muhammad Umair Yasin[1], Hina Ahmed Malik[2] and Muhammad Yousaf Nadeem[3]

Climate Change

It may be defined as it is aggregate form of weather that present long term on a specific place and specific over the period of time is called climate. It is a natural phenomenon that affects the human as well as crop in various ways.

IPCC

It is abbreviated as Intergovernmental panel on climate change that form in 2009.It predict the severally change the climate such as uneven rising of temperature, unequal distribution of rainfall and global warming particularly in developing countries.

It also predicts that with the increase of population and present situation of climate change threat the food security which may lead to sever famine (IPPC, 2009.).

Climate Change and its Impact on Crop Production

The forecasting of IPPC is that climate change is adversely affects the developing countries like Bangladesh and Pakistan. Because these countries are purely agrarian livelihood. According to IPPC most event of climate change is occurring in tropical and subtropical regions of the world. Variation in weather and rising of sea level is most pressing predicted consequence of changing a 0.6 °C global temperature, increase in precipitation 2% to 3% in the tropical latitude and decrease 3% precipitation in the subtropical regions within 20th century and scenario in 21st century. Due to variability of rain in the particularly region may lead to flooding or drought condition (IPPC, climate change 2007). Moreover, the climate change affects the crops in various ways:

1) Reduced the crop yield potential
2) Reduced the renewable resources
3) Salinity problem
4) Drought
5) Sever attack of disease
6) Introduced of unknown pathogen
7) Water logging
8) Inundation
9) Bacteria
10) Introduction of new viruses.

Adaptations of Strategies to Mitigate of Climate Change

Crop management

Conservation agriculture is applied. Crop rotation and adjust the crop according to the climate change scenario. To enhance the cultivation of leguminous crop for boosting up of soil nitrogen.

Rangeland management and pasture development

To set up the adequate grazing system for the proper management of pasture and rangeland.

Livestock management

Adopt such type of livestock and grazing system that enhance the soil carbon ratio. By adopting the proper animal nutrition, selection of breed and manure management, we controlled the emission of greenhouse gases.

Restoration of degraded soil

To control the soil erosion and increase the soil and moisture conservation. Amendment of soil by organic matter application. The perennial and deep rooted crop should be grown with the climate change pattern.

Reforestation is one of the solution to capture CO2 while photosynthesis; in this processes forests assimilate carbon and some of this returned to the atmosphere through respiration

Costal management and fisheries

For the maintaining the marine ecosystem, we should promote the non-destructive fishing culture. Cultivation of seaweed and algae that is directly or indirectly used for food and bio fuel.

New Tools for Enhancing Crop Adaptation to Climate Change

It is only done by breading program. To enhance the adaptation of crops to climate change by using the genetic engineering. We make the GMO (genetically modified organism) in which we can grow crops according to our environment. So, we can get handsome yield of crop. Many varieties are developed that is best fit according to its environment such as maize, wheat and etc.

Furthermore, biological carbon sequestration is also known as terrestrial carbon sequestration. This process is attained through techniques of soil and forest conservation. These techniques are helpful in capturing and storage of atmospheric CO2 in the deep impermeable rocks of the soil. Reforestation is one of the solution to capture CO2 while photosynthesis; in this processes forests assimilate carbon and some of this returned to the atmosphere through respiration. The carbon that remains in the plants as tissues is added to soil after decomposition as litter when plants die. Plats are also consumed by animals. When animals died and their body decomposed some amount of carbon is also added to the soil.

The authors are from 1Department of Agronomy, University of Agriculture, Faisalabad, Pakistan; 2Saline Agriculture Research Center; and 3Department of Agronomy, Nanjing Agriculture University, Nanjing, Jiangsu province China.

From page 1: Message of Dr. David James Molden, DG ICIMOD

sive change. The Kangchenjunga Landscape Conservation and Development Initiative (KLCDI), for example, has added to the KL biodiversity database an updated bibliography, as well as additional bird (618 species), butterfly (600 species), and floral checklists (5198 species). It has also helped the Reduced Emissions through Deforestation and Forest Degradation (REDD) initiative conserve the red panda as a flagship species.

The Far Eastern Himalayan Landscape (HI–LIFE) initiative works in a similar vein. It has developed thematic maps and facilities that manage and monitor biodiversity hotspots, ecoregions, protected areas, bird watching, and habitats of key species such as takins, gibbons, and Mithun. These species are common across the landscape and are highly regarded for their economic as well as ethnic, cultural, and agro-genetic value.

The Kailash Sacred Landscape Conversation and Development Initiative (KSLCDI) and the REDD initiative have helped prepare people's biodiversity registers and bio-cultural protocols focusing on traditional knowledge, binding local conservation wisdom with modern geospatial tools. They enable people-centric strategies, planning, and implementation processes in conservation and development work. Similarly, KSLCDI has supported mapping and planning human-wildlife hotspots and building capacity to combat wildlife trafficking. By emphasizing the value of cultural services, it has attracted much-needed attention to traditional knowledge and incentivized communities in the Hindu Kush Karakoram Pamir Landscape to improve conservation. Across the transboundary landscapes where ICIMOD works, the biodiversity data we have collected has been made publically accessible on a web portal. Our data and regional learning is used in academic and global fora, such as the Intergovernmental Platform for Biodiversity and Ecosystem Services and the Global Biodiversity Information Facility, to shape global conservation strategies.

However, challenges remain, particularly in managing human-wildlife conflicts, invasive alien species, forest fires, and wildlife trafficking. The solution to such problems lies in a "landscape approach" that demands strengthened institutional capacities and commitments. Whether institutions are strengthened enough will determine whether the Strategic Plan for Biodiversity Conservation 2011–2020 succeeds. In the coming years, we need to further consolidate biodiversity monitoring, innovate from on-the-ground learning, and integrate agricultural, forestry, energy, water, infrastructure, and service agendas across landscapes and river basins. To address land degradation in the mountains, we need to reward communities for sustainable conservation and development.

On this International Day for Biological Diversity 2018, it is evident that much has been achieved in the last 25 years, but also that much more work remains. I wish all mountain communities and stakeholders a day to appreciate the progress that has been made and a day to rekindle our resolve to preserve biological diversity in the HKH, to benefit our people and our planet.

Kashif Dawar

Past and present conservation scenario of Pakistan

Pakistan's record of natural resource conservation is linked with its history of conquest and colonization. Over the past millennia, successive waves of invaders poured through its northern passes into the fertile plains of .....

Past and present conservation scenario of Pakistan

Kashif Dawar

Pakistan's record of natural resource conservation is linked with its history of conquest and colonization. Over the past millennia, successive waves of invaders poured through its northern passes into the fertile plains of the subcontinent to the southeast. Indigenous populations were forced into the mountains and foothills to eke out a bare subsistence, which, among other things, entailed clearing of forests for agriculture and grazing. They eventually settled down as small-scale farmers in the perennial stream fed mid elevations and as semi transhumant in the higher altitudes. Living in close proximity to the forests, they foraged for fodder and extracted timber, fuel wood and other forest products. Equilibrium of sorts was restored, with the viability of such patterns of dependence and extraction being underpinned by subsistence needs and low population pressure.

More deliberate attempts at conservation during this early period can be traced to the establishment of game reserves by the rulers, amongst whom hunting was a recognized passion. The riverain forests of Sindh were raised by the local rulers for this purpose. Although exclusionist in nature, the creation and enclosure of hunting tracts ensured the preservation of many of the extinct species, most notable among them being the one horned rhino, the lion, tiger, black buck, red deer and the black bear (Biodiversity Action Plan, 1997).

Thus, the available records are of an essentially unsettled period, characterized by displacement, relocation and resettlement, which, Humankind has affected our planet in many ways. In the past few centuries the changes in society and the increasing pace of development mean that the scale of these impacts has catastrophically grown. There are now many threats to the natural resources of our planet. These include habitat loss and degradation, invasive aliens, over-exploitation of resources, and even climate change.

Biodiversity" is the full complexity and variety of life, at all scales, from genetic diversity, up to species and even ecosystem diversity. So, we use the term "biodiversity conservation" to refer to attempts to conserve and any parts of this natural diversity. Plant diversity is a major plant of total biodiversity - just think of the richness of tropical rain forests - it forms the basis of all food webs, and underpins the functioning of all ecosystems. So, plant conservation is an essential component of efforts for biodiversity conservation.

As plants are at risk of extinction, in all parts of the world, their conservation is a priority. By definition, is synonymous with resource degradation. However, the extent of Damage was mitigated by the subsistence needs of a relatively sparse population, and Conscious efforts at conservation of species. Events in the past 400 years of sub continental history were particularly turbulent. This period witnessed degradation on a large scale, instigated by new forms of imperialist domination and associated commercialization of the economy.

This was the era of British colonial rule, of large-scale infrastructure construction (railroads, canal networks, cantonments, bridges). Such developments were fuelled by degradations on a massive scale, namely, the commercial exploitation of coniferous forests, extensive land clearance and the alteration of river ecosystems, resulting in their fragmentation and the disappearance of riverain thorn forests. Shrinking habitats caused many animal species to become extinct (the one horned rhino, the lion, tiger, Asiatic wild dog, cheetah and chau-singa) and endangered others (leopard, gavial, marsh crocodile, black buck, black bear, lynx, caracal and red deer).

Feudal hunting privileges, initially a factor in conservation acquired pernicious dimensions with daily game bags running into the hundreds. The legal and administrative precedents for protected areas management was first laid down in forestry acts, introduced by the British in the mid-nineteenth century. Driven by the need to protect their commercial interests, forest legislation declared all forests the property of the government. As a result, existing community rights to forest resources became proscribed. Initially, all forests were declared reserve forests. Right holders were allowed to cut trees, collect fuel wood and clear land with the permission of the deputy commissioner, while grazing was freely allowed. Non-right holders had to pay a tax for similar privileges.

Recognizing that communities would not take easily to their free access being circumscribed in this fashion, the concessions were increased. Although, ostensibly, returning large tracts of forest, grazing and waste land back to the communities, the management of 'guzara' lands continued to reside with the forest department that, furthermore, extracted seignior age for any proceeds generated through sales of forest products. This form of colonial governance was effective only in so far as the administration did not misuse its powers and community needs were relatively limited.

In a more fundamental sense, it was flawed. The top down, non-participatory approach drove a wedge between communities and their birthright by denying them say in its management and subjecting them to legal process, which was often, arbitrary. The unprecedented levels of degradation that the country is experiencing currently, partly has its roots in this. It has engendered conflict and a predatory mindset. Alienated from their resource base, communities are becoming profligate in its use.

The post-independence period (1947 - 1966) witnessed a further acceleration of the economic and social transformations underway in the colonial era. The commercialization of agriculture, industrial growth and the demographic explosion continued to exert relentless pressure on the stock of natural capital. Land use changes occurred on a large scale across the country, in the form of irrigation engineering, large dam construction, draining of wetlands, clearing of land for agriculture, industry, mining, roads and settlements.

Forest and river ecosystems, already under threat during the colonial period, began to lose their self-sustaining capabilities. The physical threats to the environment were further exacerbated by the collapse of traditional social structures, as people moved in search of better economic opportunities, losing touch with their roots and traditions. A combination of poverty diversified economic opportunities and the increased commercial value of natural resources (timber, fuel wood, medicinal plants and edibles) encouraged resource overuse rather than conservation.

The management system, designed for a specific purpose, was unable to cope with these changes. The multiple and often conflicting interests of commercial loggers, private developers, government and military agencies, hunters and impoverished communities placed it under relentless strain. The administration tended to choose the path of least resistance, coming down with a heavy hand on the disempowered communities and colluding for personal gain and profit with vested interests.

Rising prices of timber, fuel wood and forest products, an erosion in the standard of living of the forest custodians, fines and penalties that were selectively applied and failed to match the nature of the transgression, and royalties that were appropriated by the rich and powerful, combined to create a complex of perverse incentives antithetical to conservation.

The irony is that the key inroads into forest resources began to be made by commercial and development groups which management was not in a position to oppose and in fact, cooperated with. On the other hand, it targeted communities, whose needs were of an essentially subsistence nature and who had their rights and traditions been honoured could have collaborated with the authorities in the sustainable management of forest resources.

The author is from Abdulwali Khan University, Mardan, Pakistan

Umar Niaz

Effects and management of biological magnification on human health

Harmful chemicals and heavy metals flow into lakes, seas and ocean when agricultural and human waste is discharged into water. These chemicals and harmful metals cause various dangerous diseases and also .....

Effects and management of biological magnification on human health

Umar Niaz and Burhan Ahmad

Harmful chemicals and heavy metals flow into lakes, seas and ocean when agricultural and human waste is discharged into water. These chemicals and harmful metals cause various dangerous diseases and also affect the plants and animals. They also disturb the food chain and aquatic organisms. These chemicals are not digested they accumulate into animals that ingest them. Bio magnification happens due to predator and prey relationship.

Effects of Bio magnification

Effect on health:

Some diseases which badly effects human health like birth defects, kidney and liver failure, respiratory disorders, brain hemorrhage and heart diseases that are caused by mercury,lead,cobalt,chromium and various chemicals.

Effect on growth of marine life:

Many harmful chemicals which accumulate in the vital organs of aquatic organisms that effect their growth. SO seabird crushes their eggs due to thinner shell instead of incubation them. Selenium and other heavy metals like mercury affect the reproductive organs of fish.

Disturbance in food chain:

Mostly aquatic organisms only depend on natural food web for growth. When harmful chemicals enter into soil, sea and ocean then consumed by aquatic organisms, so they create disturbance in food chain. It's due to when small animals and plants absorb these harmful chemicals and after that small animals are consumed by large animals, and affecting the entire food web.

Biological magnification Process:

It consist on six various steps that are given below:

- By releasing harmful chemicals and other industrial effluents into environment:

In this step, these harmful chemicals enters into soil, water, lakes. Concentrations of these chemicals are very low.

Phytoplankton:

Those plants which float in the sea and absorb toxins that stay in the tissues of them. Once absorbed, the toxins stay in their tissues without being excreted or broken down. With the passage of time toxin concentration will be very high up to 200 parts.

Zooplankton:

Those animals which float in seas and consume phytoplankton so by consuming them they take toxins which are present in these plants.so with the passage of time concentration increased up to two parts per billion.

Small fish eat zooplanktons:

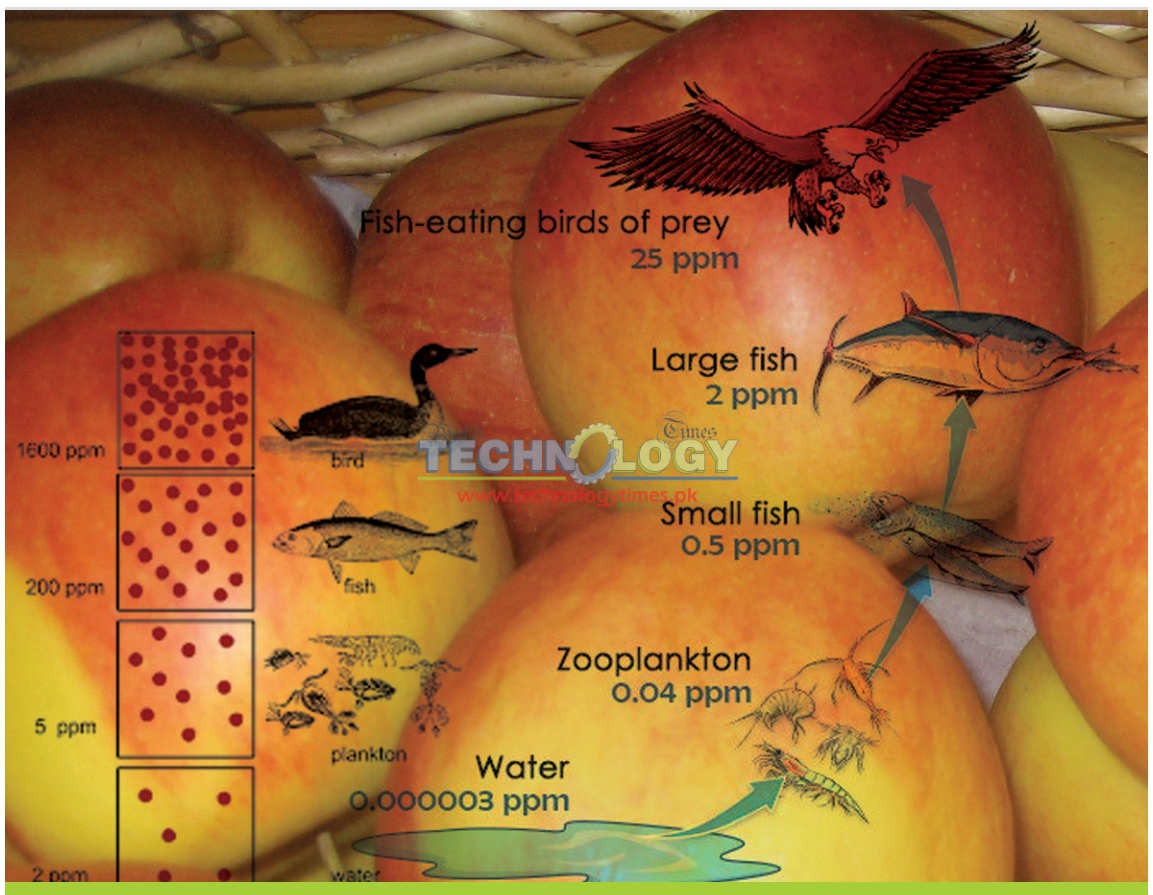
They feed on these small animals so consequently, they also take up toxins which get absorbed in fatty tissues

Large fish consume smaller fish:

Large fish consume smaller fish for survival so like that they take up toxins by feeding smaller fish. The concentrations become higher up to 80 to 100 parts per billion.

Other organisms consume large fish:

When other organisms like dolphins and human consume large fish for food, they also absorb toxins. Human beings build up the toxins when they consume fish. So concentration will be high up to 10000 to 15000 parts per billion.



Mostly aquatic organisms only depend on natural food web for growth. When harmful chemicals enter into soil, sea and ocean then consumed by aquatic organisms, so they create disturbance in food chain

Management strategies:

Following are few important points for management strategies:

We should not put the grease, fat oil and other oils down the sink

- We should not place the chemicals and other cleaning material down the sink
- Dust clothes, rappers, and other papers should be properly discarded in basket or dustbin
- We should use minimum amount of detergents for washing clothes and dishes
- We should use only phosphate free soaps
- We should use minimum quantity of fertilizers and chemicals for increasing our production

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From page 1: Message of Mahmood Akhtar Cheema, CR of IUCN Pakistan

for achieving Aichi Biodiversity Targets and Sustainable Development Goals.

IUCN Pakistan was also the main partner of the then Ministry of Environment for developing the first Biodiversity Action Plan for Pakistan in the year 2000 which was an important milestone and a major step towards conservation of Biodiversity in the country.

The Coordinating Council of UNESCO's Man and the Biosphere Programme in 2010. The designating process was initiated by IUCN Pakistan under its UNDP funded project titled: Mainstreaming Biodiversity Conservation into the Juniper Forest Ecosystem Production in collaboration with the Balochistan Forest and Wildlife Department with UNESCO Pakistan's financial support under One UN Programme in consultation with all the stakeholders, local communities and other relevant government departments.

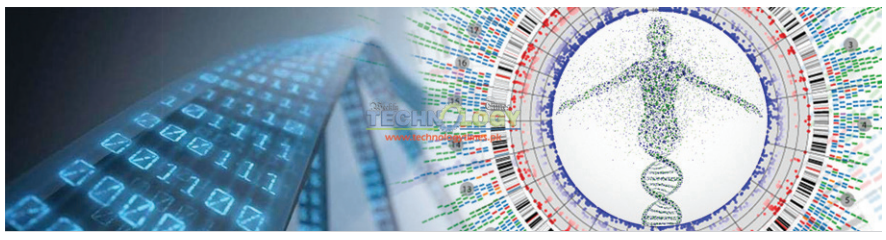
In the past some of the successfully implemented programmes and projects of Pakistan for conserving the Biodiversity in Pakistan include: Conservation green turtles along Pakistan's coasts; conserving vanishing vultures in Tharparkar; conservation of fresh water turtles and the world renowned trophy hunting programme of Pakistan under IUCN's MACP Programme has helped in increasing the dwindling population of Markhor in Pakistan. It also worked benefitted the local communities through promotion of herbal and medicinal plants.

Keeping in view the immense variety of wildlife, flora and fauna in Pakistan it is extremely difficult for a single entity to salvage the species are on the verge of extinction. It is important for every person being the custodian of the natural wealth to take every possible measure that protects and conserves nature. Since every species has a distinct role on this earth, it is therefore important that every species must survive.

Aqsa Arshad

The progress and application of genomic selection as a novel breeding paradigm

Agriculture is the principal means of meeting the nutritional requirements of the world's population. The predictable growth in population from the present 6 billion to 10–11 billion within 50 years will put massive .....



The progress and application of genomic selection as a novel breeding paradigm

Aqsa Arshad[1], Asim Munawar[1], Muhammad Ishaque Mastoi[2], Waqas Wakil[1], Faiza Usman[3], Anum Balooch[1]

Agriculture is the principal means of meeting the nutritional requirements of the world's population. The predictable growth in population from the present 6 billion to 10–11 billion within 50 years will put massive strain on the world's food supply. Right now, approximately 801 million people are emaciated. In the past, improvement in agriculture throughout the use of traditional breeding approach managed to keep rapidity with increased stipulate. The problem in front of agriculture today is that conventional breeding requires many decades to bring together enviable traits and eliminate disagreeable traits. The time requisite for conventional breeding is one of the major rationales that agricultural researchers together in academia and in the biotech diligence have turned to genomics as a foundation of the next green revolution. Genomics has the prospective to rapidly recognize genes that confer practical traits. Sequencing of the genomes of agriculturally significant species allow researchers to narrate a trait on a genetic chart to a specific gene on the corporal map.

Genomics applied to agriculture:

Agriculture encompasses two major lessons of organisms: farm animals and crop plants. Amongst crop plants, the most significant, both nutritionally and economically are maize (corn), wheat and rice. The most deliberate farm animals are the huge mammals-pigs, cows, and horses-in addition as poultry. The genomics approached functional to agriculturally significant species are very similar for both animals and plants. Of key attention is the ability to narrate an agriculturally significant trait, like meat quality, to one or extra genes. A first step in this progression is to develop higher density genetic and corporeal maps. Traits occasionally separate out as simple monogenic loci, in which casing they are relatively undemanding to place on a genetic chart. More than, more often one gene contribute to a trait. To make out the contributions of quite a few genes to a trait, a genetic scrutiny known as quantitative trait loci is used. For singles and multiples gene traits, the best ever way to identify the genes of interest is to narrate the physical map location of the gene to a full genomes sequences.

Sequencing of plant genomes:

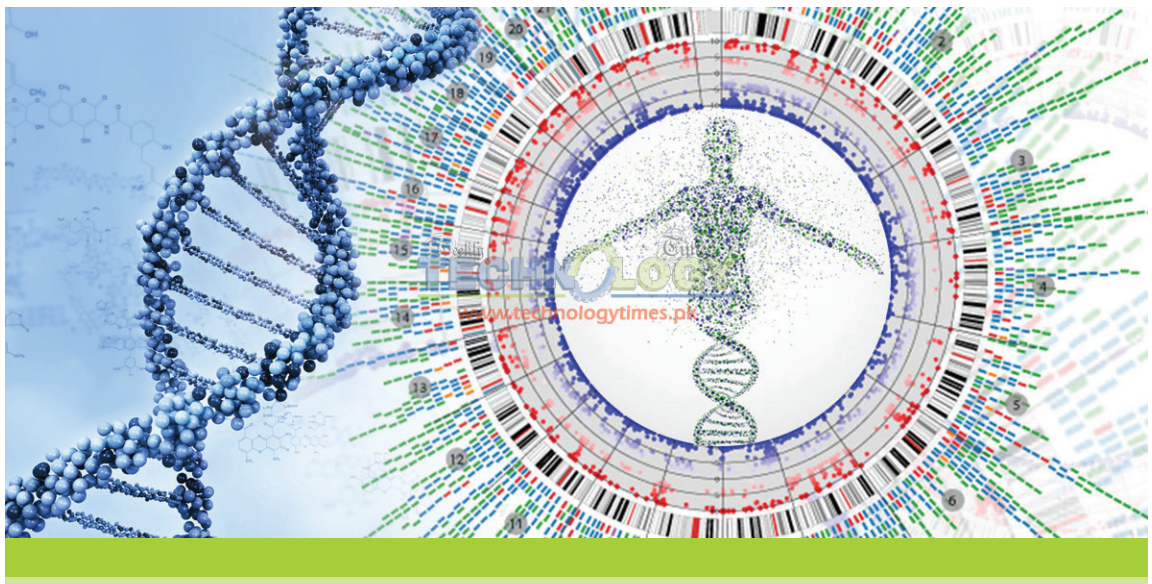
Most crops plant genomes are very huge; the first plants to be sequenced had no straight agricultural worth. Arabidopsis thaliana is a weed associated to mustard and cabbage. However, it has turn into known as the plant models species. A number of researchers have begin to refer to it as the "references plants" because its composition and development are a lot similar to those of crops plants than the development and physiology of animal sculpt systems such as C. elegans or Drosophila are to those of human. The Arabidopsis genomes sequence was available in December 2001. The genome is about 131 Mbp in size, which is alike to those of Drosophila and C. elegans. It contains roughly 29,000 genes, which just about the same numbers is found in human and quite a small piece more than that founds in Drosophila and C. elegans.

Sequencing strategies for grass genomes:

The arrangement of cereals crop genomes has lead to alternative approach to genomes sequencing that cut off the genic island and leave at the back the sea of retroposon. One came up to rely on the facts that the genic island tends to surround a lower number of methyl's groups attaché to the DNA than that restricted by the retroposon region. Bacteria have enzyme which identify and digest methylateds DNA are then worn to produce libraries of genomics DNA. The resultant libraries are enriching for regions of non-methylateds DNA. One more approach use the property of hybridization kinetic of DNA to augment for genic island.

Genomics of farm mammals:

Genome sequencing effort have been initiate or are being contemplate for all of the major ranch animals, including sheep, cow, poultry, and pig. For the primary three, it is generally view that, because they are shut relatives of humans and rodents,



A subsequent Green Revolution, driven mainly by eliminating production constraint, might incorporate activities toward advancing the efficiency frontier and transforming production system

draft sequence should be sufficient. The thought is to use the rat, mouse, and human genome as scaffold upon which one can position draft sequence of the associated farm animal. BAC library have been completed for all of those specie, and connoting map are in progresses. As sequencing cost fall, full genomes sequence will approximately certainly become obtainable. In the interim, there are widespread libraries obtainable for most farms mammals.

Sequencing of agricultural pathogens:

In addition to as long as information concerning the genome of agriculturally expensive specie, genomic can also assist in the identification and discovery of pathogen that attack crops plants and farms animal. Work has previously beguns to sequences the genome of both plants and animals. Amongst animal pathogen, most are bacteria or viruses, which have moderately small genome. The accomplished sequences of Brucella Suis, bacteria that infect animal and can also causes disease in human, revealed that countless of the genes that organize its metabolism execute a similar function in a plant pathogens, Agro bacterium tumefaciens. Even though viruses and bacteria can infect plant as well, a lot of the worst plant pathogen, in economic term, is fungi, which have relatively huge genomes. This truth has destined that sequencing of plant pathogen has lag at the back that of animal pathogen.

Bioterrorism issues:

Additional momentum for sequencing agricultural pathogen has approach from worries about possible bioterrorism's attack. With the agricultural practice used on the majority U.S. farms, diseases can increase very rapidly. An example of the rapidity of disease spread was seeing with the recent outbreaks in the United Kingdom of mouth and foot diseases, which was not connected to bioterrorisms. The economic belongings of disease outbreaks can be distressing. The charge to the British economy of the foots and mouths disease outbreaks was predictable to be as much as US $49 billion. Knowledge of pathogens genome will permit the quick identification of the reason of disease outbreaks. Genomic knowledge might also be worn in new rapid detection technologies creature urbanized to contest bioterrorism. In reality, the bacteria Brucella Suis were careful for use as potential bio warfare.

Conclusion:

The research society must pay attention to the growth of locally adapted varieties. A subsequent Green Revolution, driven mainly by eliminating production constraint, might incorporate activities toward advancing the efficiency frontier and transforming production system. Genomic tool supply an infrastructure to place bare the secret of the genetic potential of plant to respond to a variety of environment. Much foundational employment remains to be complete and translating this in sequence into climate resilient crop will necessitate additional huge investments. As agricultural initiative can take 14–31decades to yield maximal return the required investment need to be made at the present. By working mutually, leading crops genome researcher can help maintain future food supplies.

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Syed Shoaib Bukhari

Household techniques for detection of adulteration in commonly used foods

Food adulteration has become a common issue in our society. Now there is no difficulty to say that every edible processed item contains intentionally added substances, which may lead to some hazardous effects .....

Household techniques for detection of adulteration in commonly used foods

Syed Shoaib Bukhari

Food adulteration has become a common issue in our society. Now there is no difficulty to say that every edible processed item contains intentionally added substances, which may lead to some hazardous effects on consumer health. The main purpose of addition of these substances is to create some Extra profit but the adulterer does not know the freaky outcomes of this phenomenon.

Food adulterants are the chemical substances that are added (intentionally) in food to alter its properties that may lead to extra profit for producer or retailer. This may range from addition of water in milk to addition of brick powder in red chili powder and many more. But thanks to the Scientific study and research for enabling us to develop several methods to determine these hidden health enemies.

Due to lack of proper laboratory facilities and instrumental approach, it is difficult for a common man to identify these hazardous substances but there are several household methods that are considered fruitful for detection without using any sophisticated instruments or expensive reagents. Some of the common methods to determine adulterants are given below:

Milk adulteration determination:

The most common and easiest substrate for adulteration is milk. According to the recent survey in Punjab about 70% of milk in urban areas is adulterated with not only with water but various harmful chemicals like Urea, non food starches, melamine, Washing soda and Baking soda etc. These chemicals along with added unhygienic water may lead to cancer, nausea, food poisoning and several heart problems.

Place a drop of milk on an inclined surface. If drop leaves a white trail or streak it is adulterated. Another method that can be commonly employed at home includes boiling of milk and sensory evaluation. If it turns yellow on heating and gives bitter and soapy taste, then it is adulterated with synthetic substance.

Detection of adulterants in Red chili powder:

The most commonly used adulterants in red chili powder are Brick powder and saw dust which are highly carcinogenic in nature. Unfortunately the adulterated chili powder is openly sold in whole sale markets with different prices depend upon varying amount of adulterant portion in product.

Take a clean glass and fill it with water then add 1 tsp of chili powder if colored steaks appear then the chili powder is adulterated.

Detection of adulterants in turmeric powder:

Turmeric powder usually contains non permitted colorants like metanil yellow or yellow dye. These substances have a potential to cause stomach disorders and cancer.

Add a few drops of concentrated mineral acid like HCL in a test tube containing turmeric powder solution. If color changes to pink, purple or violet, the mixture will contain added dye.

Detection of Adulterants in ice cream:

Ice cream processed from adulterated milk contains respective chemicals like washing powder which is highly chronic for liver and stomach

The washing powder containing ice cream starts producing bubbles or foam if lemon juice is added in it.

Detection of Adulterants in Ghee:

In ghee animal fats or starches substances are commonly added as adulterants. These substances may cause anemia or heart enlargement.

Add 1 ml of water in a test tube containing 0.5g of ghee and boil the mixture. Cool the mixture and add 1 drop of iodine in it. The appearance of blue color indicates the presence of starchy substances.

Detection of Adulterants in Sugar:

Sugar is commonly used household food ingredient. Chalk powder is intentionally added in sugar to increase weight which in turn gives extra profit to seller.

The pure sugar when added in water sinks directly to the bottom. In the presence of chalk powder the adulterant remains on the surface.

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Detection of Adulterants in Tea:

Tea may contain artificial colors. The very harmful textile base colors are frequently used as adulterants that are potentially harmful for liver and stomach.

Sprinkle some amount of tea powder on blotting paper, change in color of blotting paper to orange or yellow indicate the presence of artificial color.

Detection of Adulterants in Honey:

Water is commonly added in honey to make it impure. Addition of unhygienic water further enhances the health risks.

Dip the cotton wick in adulterated honey. It will not burn when ignite with matchstick while the burning occur in case of pure honey.

Detection of Adulterants in coffee:

The dry root of the chicory plant is used as adulterants in coffee and decreases its purity level.

Sprinkle the Coffee powder contain chicory on the surface of water in glass the coffee floats on surface while the chicory particles settle down with a yellow trail leave behind.

Detection of Adulterants in wheat flour:

Even the wheat flour contains intentionally added chalk Powder which can be identified by adding few drops of concentrated HCL by effervescence.

The only long term solution to overcome this social ailment is to modify the behavior which can be attained through religious and social education with fair implementation of food safety laws.

The author is MSc (hons.) in Food Technology from National Institute of Food Science and Technology, University of Agriculture, Faisalabad