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VANA PREMI



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Photo by Sri M.N Jayakumar/IFS (Retd), FRPS, MFIAP

Leopard cub descending the tree, Nagarhole National Park, India

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- Large grower of about 26,809.00 Ha. of Eucalyptus clonal / seed origin plantations. Bamboo also grown as an important crop over 6,405.00 Ha.
- The TSFDC has also taken up the challenging task of Eco-Tourism development in the State. Already made open to public – Hyderabad Botanical Garden, Pala Pitta Cycling Park near Hi-Tech City, Madhapur, which has received the ISO 9001:2015 certification on 16-10-2019. Effective SMC measures for recharging pond water and improving surface water taken up in association with Smaran NGO. Mahavir Nischal Van Eco-Tourism Centre, Vanasthalipuram, and Mrugavani National Park at Chilkur are attracting increasing number of visitors.
- TSFDC is also developing Urban Parks in Lalgadi Malakpet RF Cluster, Thumukunta RF & Gowdelli PC Kalan & PC Khurd Cluster. Sankalp Taru NGO is collaborating with TSFDC in improving greenery at Gowdelli Park.
- TSFDC has also taken up consultancy work for NTPC and RFCL and successfully raised multiple Row avenue plantation along Rajiv Rahadari highway in peddapally Dist.
- Dhanvanthari herbal garden is revived with support from Deloitte and Technical support of environment forest solutions.

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Editorial

Forest Fires, rise of temperature and climate change:

Fire is the visible effect of the process of combustion. The fuel must be heated to its ignition temperature for combustion to occur. It occurs between oxygen in the air and some sort of fuel. Fuels can be solids, liquids or gases. The reaction will keep going as long as there is enough heat, fuel and oxygen. Combustion can be slow or fast depending on the amount of oxygen available and velocity of wind. Combustion releases heat, light, and various reaction products which will have adverse effect on the health of living organisms including human. Fire in its most common form can result in conflagration, which has the potential to cause physical damage through burning. Since last few years we are observing increased number of fires and fire accidents are occurring in large areas throughout the globe, especially in forest areas, which were almost absent a century ago. During the years 2019 and 2020 very massive and dangerous fire accidents have taken place in Amazon rain Forests, Australian bush or forest fires and California forest fires. In India also forest fires have increased since last few years, though increased number of fire protection works are taken in the forests of our country. In forest fires the fuel is mostly fire wood and lops and tops left after transport of timber which is over exploited, from forests. The over exploitation of the forest is due to many reasons, like agricultural expansion, cattle breeding, timber extraction, cellulose manufacturing, mining, oil extraction, dam construction and infrastructure development. These forest fires not only change the type of forest to lower category and reduce

its productivity but also kill the biodiversity of that the forests.

Fires in Amazon rain forest:

Fire in Amazon rain forest started in January 2019 and continued up to October 2019. The area was continuously burning for almost 10 months and 906,000 hectares (2,240,000 acres; 9,060 km²) of forest area was completely devastated. The reason for large scale forest fires is slash-burning, deforestation for agriculture and effects of climate change and global warming due to unusually longer dry season and above average temperatures around worldwide throughout 2019. When fires rage through a forest, it's not just that we're losing valuable tree cover but there's pollution being sent up into the sky which causes many adverse effects on the living organisms. Record-breaking fires are ripping through the Amazon — an ecosystem on which the whole world depends.

Brazil is home to more than 24 million people, including hundreds of thousands of Indigenous peoples belonging to 180 different groups. The region is home to 10 percent of all plant and animal species known on Earth. There are approximately 40,000 species of plants and more than 400 mammals, with almost 1,300 different varieties of birds and an insect population in the millions. In addition to its unparalleled diversity of life, the Amazon plays an essential role in helping to control the planet's atmospheric carbon levels. The Amazon Basin stores approximately 100 billion metric tons of carbon — that's more than ten times the annual global emissions from fossil fuels. While it covers 2.6 million square miles across nine countries — Brazil, Bolivia, Peru, Colombia, Ecuador, Venezuela, Guyana,

Suriname, and French Guiana. Wild animals that live in the forest are also in danger of losing their habitat and dying due to this fire. Bigger animals have a better chance of escape, given they can move faster and make leaps.

500 jaguars are believed dead in Brazil and Bolivia, or have been ousted from their homes due to these fire occurrences. And this is a species already threatened by habitat loss and poaching. Through July 2019 over 7,200 square miles of the Brazilian rainforest has burned. In the first seven months of 2020, more than 13,000sq km (5,019sq miles) of the Brazilian Amazon forest was burned again, according to analysis of satellite data provided by Dr Michelle Kalamandeen, a tropical ecologist on the Amazon rainforest. That's more than eight times the size of London. According to the Global Fire Emissions Database project run by NASA, fires in the Amazon in 2020 surpassed those of 2019. In fact, 2020's fires have been the worst since at least 2012. There was loss of human life also in these Amazon rain forest. In August 2020 Brazil's National Institute for Space Research reported that satellite data shows that the number of fires in the Amazon increased by 28% to ~6,800 fires in July compared to the ~5,300 wildfires in July 2019. This indicated a, potentially worsened, repeat of 2019's accelerated destruction of one of the world's largest protectable buffers against global warming in 2020. According to the World Wildlife Fund, the jaguar, for example, is already "near threatened" and the loss of food supplies and habitat due to the fires make the situation more critical

Australian Bush Fire:

Australia is no stranger to bushfires however, the 2019-2020 season proved to be unprecedented in many ways. The first major bushfires began

even before the official arrival of spring in June and then new out-of-control fires sprung up at the beginning of Sept. 2019. Australia faced a devastating start to its fire season in late 2019, and things swiftly got worse before rains helped contain many of the worst fires in February 2020. Hundreds of fires erupted in New South Wales, Australia, prompting the government to declare a state of emergency in November 2019. Fires rapidly spread across all states to become some of the most devastating on record. An area about the size of South Korea, roughly 25.5 million acres, has burned. At least 33 people are dead, including at least three volunteer firefighters, and more are missing. Around 3,000 homes have been destroyed or damaged. As blazes intensified in the days leading up to New Year's Eve, thousands of people who were forced to evacuate sought shelter on beaches across New South Wales and Victoria.

The smoke became another disaster. On January 1st, Australia's capital recorded the worst pollution it's ever seen, with an air quality index 23 times higher than what's considered "hazardous." Smoke in the city crept into the hospital rooms, stopped MRI machines from working, and triggered respiratory distress in one elderly woman who died soon after she stepped off a plane. The smoke reached New Zealand, 1,000 miles away, where it has created eerie scenes atop glacier-covered peaks.

More than 1 billion mammals, birds, and reptiles lost their lives in the blazes, according to one estimate from the University of Sydney. Around 25,000 koalas were feared dead on Kangaroo Island. Eight thousand koalas, a third of all the koalas in New South Wales, are believed to have perished, and about 30 percent of the koalas' habitat has also been wiped out. The devastation only adds to existing

pressures on Australia's unique ecosystems. The continent is home to 244 species that are not found anywhere else. The region also has the highest rate of native mammals becoming extinct over the past 200 years. The Department of Agriculture, Water and the Environment published a list on February 11th of the 113 animal species, including the platypus, that most urgently need help following the fires.

This season's fires, however, are unprecedented. It's a much earlier fire season, and the fires have gotten very big, very early. Weather conditions feeding the fires are historic. Australia suffered from its hottest day on record on December 18th, reaching a national average temperature of 41.9 degrees Celsius (107.4 degrees Fahrenheit). Extreme heat and drought create more tinder to fuel fires. The heightened intensity and frequency of wildfires fall in line with scientists' predictions for a warming world. "The reality is, this is a function of climate change — this extreme heat, these extreme conditions that are so volatile and are producing the types of intensity and early season burning that we do not normally see in Australia. The fire situation worsened significantly at the beginning of Nov. 2019 with increasing temperatures and a prolonged drought.

California forest fires:

The 2020 California wildfire season is a series of ongoing wildfires that are burning across the state of California. The season is a part of the 2020 Western United States wildfire season. As of September 29, 2020, a total of 8,155 fires have burned 4,018,888 acres or 1,626,386 hectares, more than 4% of the state's roughly 100 million acres of land, making 2020 the largest wildfire season recorded in California history, according to the California Department

of Forestry and Fire Protection. The intensity of the fires has been increased by drying and heating from human-induced climate change.

Early in the year, there was a concern for the 2020 fire season to potentially be prolonged and especially grave, due to the unusually dry months of January and February, one of the driest such periods of any calendar year on record. On March 22, a state of emergency was declared by California Governor.

Leading climate scientists argue that climate change increases the temperature of wildfires in California, the risk for drought, and potentially also the frequency of such events. Susan Clark, director of the Sustainability Initiative at the University at Buffalo argues, "This is climate change. This increased intensity and frequency of temperatures and heat waves are part of the projections for the future. There is going to be more morbidity and mortality from heat. There are going to be more extremes." More than two million acres have burned across the state so far in 2020, which makes this a record year. High temperatures and strong winds have made the situation even worse. Los Angeles region hit a record 121 degrees and Death Valley recently reached 130 degrees .

Number of fire accidents are also increasing in cities and towns of our country. Fire accidents used to be in the summer months only and from July to February were fire free months every year in the past. Now it is a common site to see fire accidents even in winter and rainy months. Today i.e. on 15th of November there are six fire accidents in Hyderabad city alone and burning since last six hours. Fire fighters are trying to put off these forests. Climate change describes a change in the average conditions — such as temperature and rainfall — in a region over

a long period of time. NASA scientists have observed Earth's surface is warming, and many of the warmest years on record have happened in the past 20 years. Due to low rainfall and increased temperatures fire accidents are occurring throughout the globe, including forest areas. The major cause of climate change is due to human activity. The effects of climate change on humans, mostly due to warming and shifts in precipitation, have been detected worldwide. Nature is ringing these danger bells and giving signals to us frequently, about occurrence of these fires in forests, cities and towns but we are in deep slumber and nor realising the cause of these fires. The increased fire accidents

and shift in precipitation are signals for us to correct ourselves and reverse the climate change by adopting methods like increasing tree cover, replacing fossil fuel, reducing the use of greenhouse gasses, change in agricultural practices, and finally at least stabilizing our existing global population, if we cannot reduce.

Vana Premi wishes that we open our ears and hear the nature's danger bells which are ringing frequently, throughout the globe and realise the immediate necessity of taking action to stop further rise in global temperature for the safety of all the living organisms of this globe and save them from extinction including super human being. **QMK**

Letters to the Editor

Dear Qamar sab

Thank you for making available the Vana Premi magazine on line and the knowledgeable articles pertaining to our interest. I am enjoying reading all those articles in my leisure time here in USA since oct 2020. Most of the articles are of good standard and interesting. keep it up. Thanks to editorial Board members.

With regards

S. G. Varadkar

58-60, SFRC, batch (U S A)

*“Christmas is not a time nor a season,
but a state of mind. To cherish peace and
goodwill, to be plenteous in mercy,
is to have the real spirit of Christmas.”*

WHY INDIAN FORESTS ARE LOW PRODUCTIVE?

By

Dr UMA SHANKER SINGH D.Sc.

The productivity of Indian forests is low compared to the world standards, increasing the gap between demand and supply of various forest products. Mean annual increment (MAI), a measure of forest productivity, is 0.7 m³/ha for Indian forests as against the world average of 2.1 m³/ha. Similarly, as noted above, the growth rate of per hectare growing stock in Indian forests is significantly lower than the global average. This is mainly due to the 'non-recycling of biomass' because of various pressures on forests. The yield of plantations raised by forest departments is far below potential. This is because of the interplay of factors like poor quality of seeds and nursery techniques, inadequate post plantation care, and unsuitability of sites for the planted species. In contrast, plantations facilitated by research organizations like TERI and the private sector companies like the ITC have shown better yields.

OWNERSHIP AND MANAGEMENT:

About 97% of the total forest area is owned by the government (comprising 93% of the forest area controlled by state forest departments and 4% by state revenue departments) and the rest 3% is owned by private entities and communities. However, of the total government claimed forest area, 18% is un-classed land, which has been claimed by the communities and individuals, and their disputes with regard to this land are yet to be settled. Majority of this un-classed area lies in the north-eastern states of India. Ownership claims are being contested in many other parts of the country as well. Though ownership of forests lies largely with the government, there has been an increasing involvement of communities in the management of forests, over the years. It is reported that 28% of the

forest area is managed by the forest departments, in collaboration with communities, under the Joint Forest Management (JFM) Programme. Similarly, there have been efforts by companies and individual farmers to manage vegetative cover mainly outside the forest areas. After the promulgation of the Forest (Conservation) Act, 1980, which substantially reduced the supply of raw material from state forest lands to wood-based industries, the government has been promoting plantation of trees under various agro-forestry and social forestry plantation schemes. However, the majority of the forest area, that is, about 69%, continues to be managed by the government alone, predominantly by forest departments

TABLE-1
OWNERSHIP OF THE FORESTS

Management Agencies	Percentage Of Forest Area
Government	69
Government and Communities	28
Communities and Private Entities	03

Source: Moefcc (2005) And Wii (2006). Teri Estimates

ISSUES:

There are some issues which are very important from Indian point of views in order to be able to explain why productivity of Indian forest is going down very drastically. These issues are explained below.

DEMAND AND SUPPLY GAP IN FUELWOOD, TIMBER, AND FODDER:

There is a substantial gap in the demand and supply of major forest products (see Table2). This leads to a

vicious circle, wherein the unsustainable exploitation of forests contributes to their degradation, which in turn reduces the supply of products and provision of services

TABLE-2
DEMAND AND SUPPLY GAP OF VARIOUS
FOREST PRODUCTS

Forest Products	De-mand in MT	Sustain-able Sup-ply in MT	Gap
Fuelwood	228	128	100
Fodder (Green & Dry)	1594	741	853
Timber	55	41	14

Source: Teri Estimates.

FUEL WOOD:

Fuel wood has remained the principal component of rural domestic energy, and also the source of commercial energy such as brick kilns, hotels and restaurants in semi-urban areas. The percentage of population using fuel wood is higher in rural areas (67.3%) and 14% in urban and semi-urban areas (NSSO, 2012). Fuel wood is largely used by women for cooking purpose and approximately spends more than 374 hours in a year for collecting fuel wood (clencookstove.org). The fuel wood has been collected from forests, trees grown on farm lands, homesteads and common land outside forest. The annual fuel wood consumption by 854 million people in India is 216.4 million tonnes per year (FSI, 2011). Around 27% of fuel wood has been collected from Government owned forests (Public Land). India is home to more than 240 million households out of which about 100 million households are still deprived of LPG as cooking fuel and have to rely on firewood, coal, dung cakes etc., as primary source of cooking. Fuel wood collection and sale constitute the source

of livelihood for 11% of the population, making forests the single largest employer in the energy sector. There are different estimates on India's total demand for fuel wood, with reliable estimates putting the figure in the range of 200–230 million tonnes (MT). On the supply side, it is reported that 49% of total fuel wood is sourced from farm forestry and trees outside forests, and the remaining 51% is derived from natural forests. This implies that 100–115 MT of fuel wood is extracted from natural forests, which is almost six to seven times higher than the estimated sustainable supply of 17 MT of fuel wood from these forests. This unsustainable exploitation of forests at the local level also has implications for global climate change in general and productivity of Indian forest in particular. Various studies underscore the linkage between unsustainable extraction of fuel wood and degradation of forests. Unsustainable extraction is a consequence of both demand factors increasing population, inefficient use of fuel wood, and lack of energy alternatives for poor households and supply side issues, which include low productivity of forests.

TIMBER:

According to the FAO's 2015 report on Global Forest Assessment, the total wood extracted in India in 2011 was 434.77 million cum, out of which the fuel wood volume was 385.25 million cum or 231.15 million tonnes. India is a net importer of timber and allied products also. In 2015, India imported an estimated 18.01 million cum of timber, pulpwood and allied products worth US \$6,701.3 million, which included wood logs, panel and plywood, pulpwood, paper, furniture and other wooden products. Under all categories of timber, wood logs and paper constitute the major part of Indian wood imports. In its 2011 assessment, FSI has provided the estimates of consumption of timber in only three sectors (in non-fuel wood categories)—housing, furniture and agricultural implements. Adding all categories, the total estimated wood consumption (excluding fuel wood) in India comes to about 69 million cum

per year. This may be a gross underestimation, considering that a large share of wood markets, especially panel and plywood, and furniture markets, are fairly unorganized, and no official estimates are available for the same.

FODDER:

India with only 2.29% of land area of the world, is maintaining nearly 17.4% of world human population and 10.7% of livestock (more than 510 million heads) creating a huge pressure on land, water and other resources. Furthermore, some part of our country is also largely inhabitable due to harsh climate as reflected by very low population density. The grazing lands, considered to be one of the most productive ecosystems in the Indian Subcontinent, have been at the receiving end for long. As per estimates, the country's pastures have reduced from about 70 million ha in 1947 to just about 38 million ha in 1997. The remaining grazing lands have either already degraded or are in the process of degradation with average carrying capacity of less than 1 ACU (adult cattle unit). These grazing lands, often looked at as 'wastelands' on which tree plantations have to be done or which can be easily diverted for other uses, are suffering due to management neglect. Many of the grazing lands have been invaded by non-palatable invasive alien species like *Lantana*, *Eupatorium*, *Parthenium*, *Prosopis juliflora*, *Leucaena*, etc. severely impacting their productivity. This leads to a grazing intensity of about more than 46 animals per hectare as against the optimum level of five animals per hectare. It is reported that against the annual green and dry fodder requirement of 1025 MT and 569 MT, only 356 MT and 385 MT of fodder is available, respectively, which leaves a huge gap of 669 MT and 184 MT, respectively (Roy and Singh 2008). Consequently, a large proportion of cattle depends on forests for fulfilling its grazing needs, adversely impacting the stock and regeneration capacity of forests due to over-browsing, lopping, and trampling of young saplings. It is estimated that

more than 270 million cattle grazes in the forests against the carrying capacity of 30 million (ICFRE 2001). It is also estimated that 78% of India's forest area is affected by grazing; the incidence of grazing is estimated as being high in 18% of the forest area, medium in 31%, and low in 29% of the forest area (MoEF 2006).

ENCROACHMENTS:

An RTI was filed in 2019 by Mr. Akash Vashisth on the status of encroachment in the Indian Forest and it was stated in reply to the query that nearly 2%, or 13,000 sq. km, of India's total forest area is occupied by encroachers. India's total forest cover is 708,273 sq. km. The largest area encroached on is in Madhya Pradesh with about 5347.17 sq. km, or nearly 7%, of 7, 7414 sq. km of forests being occupied by squatters; followed by Assam (11.28%) and Odisha (1.5%). Deforestation is a major cause of environmental degradation and lower productivity of the forest. Tropical countries with huge population pressure and widespread poverty are main frontier of deforestation. India, being one of the most densely populated country with diminishing tropical forestland, supports lowest per capita forestland. The forests are depleting mainly due to illegal logging and conversion to non-forestry uses. Large chunks of forest lands are known to have been encroached, with indications of the involvement of the state machinery. State governments have failed to act on the directives and guidelines issued by the central government and the Supreme Court of India, to avoid any adverse political response, which has led to further encroachments.

FOREST FIRES:

The Forest Survey of India released a report last year, analysing areas in India prone to fires. Out of the total 7, 12,249 square km of forest cover, 1, 52,421 square km (21.40%) is either highly or extremely fire prone. The forests of Mizoram, Chhattisgarh, Manipur, Odisha and Madhya Pradesh

are most vulnerable. Global heating is contributing to forest fires, and those fires are stoking further heating: a deadly cycle. Observations over the past twenty years show that the increasing intensity and spread of forest fires in Asia were largely related to rises in temperature and declines in precipitation, in combination with an increasing intensity of land use (IPCC 2007). Globally, the length of fire season has increased by nearly 19 % between 1979 and 2013. In between 2015 and 2017 the incidence of forest fire has increased to the level of 125% and we have not been able to pay our attention to this problem. In India, record breaking temperatures have driven an early start to forest fire season, with most forest fires reported during summer season. Forest fires greatly increased in number and extent between 2014 and 2018. 2015 (+0.42°C), 2016 (+0.71°C), and 2017 (+0.53°C) were the warmest years on record. Accordingly, forest fires too have increased in scale over the same period: 2015 saw 24,817 cases, 2016 saw 35,888 cases, and 2017 had 37,059 cases. Climate change is expected to alter forest boundaries and types, as well as impact productivity, species population and migration, the occurrence of pests and diseases and the capacity for forests to regenerate. Forest fire plays an important role in ecosystem dynamics, biodiversity, soil and microbes. The impact of fire on established trees of *Shorea robusta* and *Tectona grandis* has no longer effects and they recover just on the onset of favourable climatic condition but the status of new recruits is adversely affected. Other important forest species viz. *Terminalia chebula*, *T. bellirica* and *T. tomentosa* which are having commercial and medicinal values gives poor yield after fire incidence and due to frequent fire in these area species of *Lantana camara*, *L. indica*, *Eupatorium glandulosum*, *Parthenium hysterophorus*, *Cassia tora*, and *C. occidentalis* have invaded. The most significant effects of fire are reported to oak and coniferous forest which takes long time to recover because these species

catch high intensity crown fire due to high calorific values. The low intensity fire results in combustion of litter and soil organic matter, increases nutrients availability which supports regeneration of herbs and growth of post fire community. The higher intensity fire results into complete loss of soil organic matter and volatilization of nitrogen, phosphorus and potassium but very high temperature is required for complete burning of Mn, Mg, Cu and other micronutrients. The soil microorganisms are mostly sensitive towards high temperature and mostly affected. The incidence of forest fire decreases the actinomycetes, fungal population and arbuscular mycorrhizal fungi, while increases the bacterial richness. It is also reported that forest fire is set intensely by people for the collection of Mahua (*Madhuca latifolia*) flower, Sal seed and Tendu (*Diospyros melanoxylon*) leaves, without knowing that it decreases the productivity of the forests.

FOREST LAND TRANSFER AT ALRMING PACE IN LAST THREE YEARS:

The Indian government has diverted over 20,000 hectares of forest area for developmental activities such as mining, thermal power plants, dams, road, railways and irrigation projects in the past three years (2015-'18) across India. According to the official data revealed by the National Democratic Alliance government in Parliament in December 2018, a total of 20,314.12 hectares of forest land (almost the size of Kolkata) was diverted in three years 2015-2018 (till December 13, 2018). During this period, the ministry had received a total of 4,552 proposals and of those 1,280 (28.11%) got approved. An analysis was conducted by a Ph.D., student at the US' Columbia University and this has provided startling insight into the acceleration in the rate of forest land diversion proposals that have gained approval over the last six years. This has been found that out of the total 48,000 clearance proposals, around 99.3 per cent of all project proposals to divert forest land had been granted approval since 2014. This was

a marked rise from the 84.6 per cent approval rate found between 1975 and 2014. The above analysis found that in the 34 years between 1975 and 2014, approximately 21,632 sq. km of land was approved for clearing or pending clearance, whereas in the six years between 2014 and 2020 alone, 14,822 sq. km of land had been approved for clearance (or awaiting clearance) or in other words, roughly the size of the state of Nagaland. Forest land conversion leads to ecological effects (e.g., changes in water quality and wildlife habitat) and productivity.

IMPACTS OF CLIMATE CHANGE ON FORESTS OF INDIA:

There are many studies on the assessment of the impact of projected climate change on forest ecosystems in India based on climate projections of the Regional Climate Models. Based on the dynamic global vegetation modelling, vulnerable forested regions of India have been identified to assist in planning adaptation interventions. The assessment of climate impacts showed that at the national level, about 45% of the forested grids is projected to undergo change. Vulnerability assessment showed that such vulnerable forested grids are spread across India. However, their concentration is higher in the upper Himalayan stretches, parts of Central India, northern Western Ghats and the Eastern Ghats. In contrast, the north-eastern forests, southern Western Ghats and the forested regions of eastern India are estimated to be the least vulnerable. Low tree density, low biodiversity status as well as higher levels of fragmentation, in addition to climate change, contribute to the vulnerability of these forests. The mountainous forests (sub-alpine and alpine forest, the Himalayan dry temperate forest and the Himalayan moist temperate forest) are susceptible to the adverse effects of climate change. This is because climate change is predicted to be larger for regions that have greater elevations therefore, there is a strong possibility that with the

change of climate in India the productivity of forest will certainly come down.

WHY INDIA IS NOT REVERTING TO TECHNOLOGICAL CHANGES TO INCREASE FOREST PRODUCTIVITY:

(A) GENOME EDITING: Forests are rich sources of biodiversity and serve as sanctuaries to organisms under threat of extinction. They help reduce surface runoff and their roots stabilize the soil to impede erosion. Forests fix atmospheric CO₂ into biomass and consequently mitigate climate change. Wood, the primary renewable resource from forests, is widely used for energy, pulp and paper-making, textiles, and construction. Forests also provide the raw materials for non-traditional products such as bio plastics, pharmaceuticals and chemical feed stocks. Forest trees can flourish with comparatively little human intervention. They are often relegated to marginal land that is considered unfit for general agriculture or horticulture. Such areas may feature combinations of steep slopes, degraded soils, limited water, and/or nutrients. Furthermore, there is pressure on forest resources due to growth in the human population and climate change. Many forests are harvested unsustainably and forest area is decreasing. Hence, it is important to examine how forest growth can be improved to satisfy the demand for forest products. Trees usually require several decades to reach harvest size, so there is considerable interest in fast-growing forest tree species or in ways to make trees grow faster. Other key objectives of tree improvement in modern forestry include improved wood quality, pest resistance, adaptation to environmental stress, and delayed flowering or ablated reproductive organs. The long reproductive cycle of trees and their extensive requirements for space and resources impede progress in the production of superior trees through traditional breeding and selection. The intensification of environmental stressors (e.g., flooding, drought, extreme temperatures) associated with climate

change complicate the problems faced by breeders. Genetic engineering complements conventional breeding programs by providing a means to rapidly incorporate foreign genes or to manipulate endogenous genes to improve stress resistance or biomass yield. Transgenic technology can improve elite genotypes chosen from current breeding programs. Transgenic approaches to precocious flowering could enable tree crop breeders to use the power of inbreeding followed by selection to purify genomes of deleterious alleles within a reasonable period. Scientists have successfully manipulated various aspects of tree architecture, photosynthetic processes, and photosynthetic assimilation to improve the quantity and quality of biomass. Increasing sink strength by accelerating downstream processes related to the utilization or storage of photosynthetic products have also significantly improved biomass yield. Delaying reproductive growth has significantly increased vegetative biomass in annuals and some reports indicate that this may be possible in trees as well. Transgenic approaches have improved the ability of plants to survive or thrive even in the presence of various biotic and abiotic stress factors, many of which are likely to be aggravated by climate change. Some biotic factors, such as weed competition, affect trees only at the seedling/sapling stages, while others, like insect and pathogen infestations, can damage trees at any stage in their life cycle. Introduction of genes for resistance to abiotic stress such as low temperatures, osmotic extremes (salinity, drought) and heavy metal contamination, have expanded the range of potential sites for cultivation of fast-growing trees to these inhospitable environments. Most researchers have concentrated on the effects of single genes, but there are synergistically greater opportunities in pyramiding or “stacking” genes that combine superior phenotypes into an individual tree. We believe that the base of this transgenic pyramid must consist of genes proven to increase biomass,

complemented by those designed to offset stress factors that suppress biomass yield. “Gene stacking” can be done sequentially in annual crop species, by inter-crossing stable transgenic lines that over-express different genes. In trees, simultaneous introduction of many genes by multi-trait engineering, as discussed, would likely be a faster approach than crossing transgenic lines to endow trees with the various characteristics needed to thrive in the forest.

(B) TECHNOLOGY AND FPREST CONSERVATION

THE INTERNET OF THINGS: Even as India has taken positive steps to mitigate carbon emissions through the promotion of renewable energy, climate change continues to pose massive challenges to the country's growth. One of the primary reasons is that forest restoration and conservation have been largely ignored in the fight against climate change. The government itself, through its Intended Nationally Determined Contributions (INDCs) submitted to the United Nations (UN) in 2015, recognises that forestation will provide more than 33 % of the country's potential carbon emissions solutions. India's INDCs emphasise creating an additional carbon sink of 2.5 to 3 billion tonnes between 2021 and 2030 by increasing the country's green cover. Yet, at the same time, activities such as legal and illegal logging, deforestation for development purposes, and people-induced forest fires continue unabated, contradicting the goals set by official climate-action declarations. It is imperative to control the use, exploitation and management of existing green cover through sustainable planning, which can only be resolved by bringing about a radical change in the country's forest management and conservation practices. Integrating technological innovation with current sustainable practices can be an effective tool.

THE INTERNET OF THINGS (IOT): The Internet of Things (IoT) is amongst the modern technological

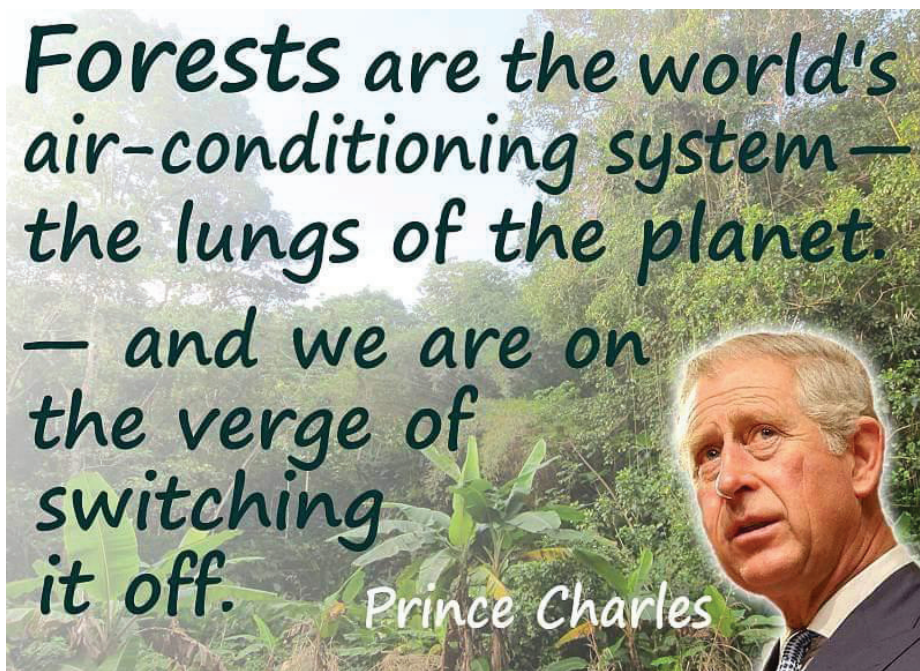
innovations that have received a significant amount of consideration in the Indian markets. While IoT in India is still in its nascent stage, the government has recognised its potential by introducing, for example, smart wearable devices for women to promote safety, smart waste-management practices, and portable water-monitoring mechanisms. The Ministry of Electronics and Information Technology, in its draft IoT policy, has also encouraged Smart Agriculture, which includes the monitoring of soil moisture, vibrations, earth density and pests, to detect potentially problematic patterns in land conditions and create a real-time monitoring system for Indian farmers. There exists in India a mechanism to avail real-time updates on farm's soil conditions including soil moisture, PH levels and nutrients, which then advises the farmers on pesticides and fertilisers; it has already been adopted by some large-scale farmers. Forest management is another sector that could benefit from these technological applications. Based on the concept of IoT, an intelligent and interoperable network of devices interconnected through a dynamic, global infrastructure network can be created to connect and exchange data across locations at any time. These technology-driven smart sensors (called 'green bots') can be the key to preserving India's forests, while also providing data that can serve as a catalyst towards more sustainable forest management. By using data on soil and weather conditions, these smart sensors can employ predictive analytics to help in sustainable forest management and conservation practices. In Brazil, for instance, whose forest cover is approximately 64% of its total land area the start-up Tree via developed a remote forest-monitoring system called Smart Forest in 2014. Tree via has developed wireless electronic sensors to monitor the real-time growth of Brazil's forest. The data collected by these sensors is then analysed and used to inform policymaking. The solutions offered by Smart Forest include digital asset registration systems,

forest research using high-precision data, hazard assessment, and specialised forestry consultation. The project is awaiting accreditation by two of Brazil's largest forest companies, where proof-of-concept tests have yielded promising results. The preliminary results covering only a few months indicate that Smart Forest is more successful in data gathering than traditional sources. Brazil is only one country where forest management is being aided by technologies such as smart sensors. In India, too, these technologies have the potential to help address some of the most fundamental challenges in forest management. Smart sensors (or 'green bots') can detect any disturbance in forest areas that might indicate logging activities: the activity triggers a signal on the green bot, which then gets reflected to the cloud, allowing the authorities to take appropriate action. This helps in the timely detection and prevention of illegal logging. Each sensor can be programmed to detect events occurring within a set grid (for instance, 5×5 km). Parameters such as daily relative humidity, daily temperature, and forest-cover density can be used to detect occurrences in the forests. The data gathered can then be assessed over time. The data can also help understand the evolution of forest dynamics more comprehensively. As the Government of India launches various programmes and introduces policy regulations to achieve the targets set in the country's INDCs, the use of green bots can be vital in providing real-time feedback on the impact of different policy and management regimes.

CONCLUSION: The gap between consumption and production of timber and wood-based products in India is rapidly increasing. However, it is difficult to estimate the quantum of this gap due to the lack of reliable data on the consumption of timber and wood products since it is a highly unregulated market. According to the 2019 report, the total forest cover of the country is 712,249 square kilometres (21.67% of India's total geographical area) slightly up from

708,273 sq. km (21.54%) in 2017. The tree cover of the country is 95,027 sq. km (2.89% of the total area) again slightly up from 93,815 sq. km. (2.85%) in 2017. Despite having 21.67 % of the country's total geographic area under natural forests; it has a limited role in meeting this growing demand. It contributes just 6.4%, about 3.17 million cubic metres (cum) of the demand, according to the State of Forest Report 2011 (this is the latest estimate available) published by the Forest Survey of India. Trees outside Forests (TOF), including the agroforestry, is meeting timber demand much more than natural forests. Currently, 44.34 million cum of timber is harvested from this source annually. The growing stock (GS) of trees under agro-forestry is approximately 70 per cent of the total GS of the TOF. Timber and pulpwood are mainly used by the construction, furniture, wood panels and paper sectors. While the demand for furniture has been rising between 12 and 15 per cent annually, the demand for paper has been rising steadily at about 8 per cent annually. In fact, India is considered the fastest growing paper market

in the world. According to experts, the annual demand for wood-based panel products such as plywood, particle board and fibre board is 8 million cubic metres against the production of 3.4 million cubic metres. It is, however, difficult to calculate the consumption figures within the Indian wood-based products industry as its market is highly unorganised and unregulated. As per a Centre for Science and Environment (CSE) analysis, the average annual production of wood by forest department is 1.97 million cum. Despite original objective of raising productivity of forests, per hectare production from their lands is as low as 0.77 cum per ha per year, while TOFs are producing nearly 3.06 cum per ha per year. Therefore, forest departments across the country have fallen far short of their objectives, and are nowhere close to becoming a major player in increasing the productivity of the forests. We are not able to invest money in forestry sector and that is also one of the reasons for a low turn around. The total budgetary outlay is on an average 0.7% for this sector which is the lowest of all sectors. ♦



MY FIRST BRUSH WITH THE DISTRICT ADMINISTRATION

By

Paresh Kumar Sharma

In my first posting as DFO Karim Nagar (East) in 1983, **Sri R. Chandra Sekhar, IAS**, was the Collector and DM, a senior Officer of 1974 batch. **Sri TS Appa Rao, IAS** was Joint-Collector, and **Sri Balvinder Singh, IPS** was Superintendent of Police. We all, including my other colleague Sri SBL Misra, DFO KW, became good family friends and spent many evenings over cups of tea & snacks together. We went on a picnic as well to Upper Manair Dam once. We had a few family get-togethers as well.

The DM used to conduct 20 Point & “**Pragathi Patham**” (The Road to Development) meetings on 3rd of every month with all the District Officials. Ours (FD's) used to be only 2 points for discussion, i.e., number of seedlings distributed and area planted. There never used to be any discussion on these 2 points, as these were factual reports.

Govt. had sanctioned various programmes under **droughtreliefscheme** in the district like maintenance of roads, construction of additional rooms in the schools, construction of community halls, repairs to existing School buildings etc. The district Collector used to give additional works to various district level officers, as Nodal Officers for a Taluka, to oversee progress of these works. I was also given this duty in my jurisdiction. However, the job of such Officers was limited only to inspect and report the progress of works. I suggested to the Collector that I could do better job by not only reporting about the progress of works but also the quality of work vis-à-vis the sanctioned estimate and check measure the works in the Measurement Books, as I (in fact all Forest Officers) was trained in basic Engineering as well. But the Collector did not agree to this proposal, and

wanted me to restrict myself to the extent of reporting the physical progress of works only, every week. I was not happy with this direction. The Collector however tried to pacify me that my appointment as Nodal Officer itself in this Block had considerable impact on the quality & quantity of works. The Collector also requested me to permit the beneficiaries to utilize the stones from the forest lands as they belonged to the weaker sections. I told him that if the individual beneficiaries collect loose boulders for their bonafide use without causing any damage to the existing vegetation, I would issue necessary instructions to my officers and staff.

The other day the local MLA **Sri D. Sripad Rao**, lone MLA of Congress Party (rest all MLAs were from TDP, the ruling Party) met me at Kataram cross (T-junction on Bhopalpalli-Mahadevpur Road and Manthani-Kataram Road) and requested me to permit the local contractors to open a stone quarry in Pratapgiri Hill in forest area. I apprised him of the provisions of Forest (Conservation) Act 1980 and informed that this was not permissible in the normal circumstances and that it would require the permission of the Govt. of India, provided this quarry was absolutely essential & un-avoidable. I informed him that EE of R&B or PR Department could prepare and submit the proposal to this extent under the FCA and I will ensure that the necessary sanction is granted by the GOI in a period of 3-4 months. However, he did not believe me and was of the view that getting permission from the GOI was a herculean task; hence he did not evince any interest in the course of action suggested by me. Nor did he take up the matter with any of the Engineering departments; hence I did not receive any proposal for the above quarry.

However, after some days during my field visit, I noticed that quarrying for stones was going on in Pratapgiri Hillock, with the use of dynamite for blasting the rocks. I immediately got it stopped and booked the concerned for the offence duly seizing the equipment etc. I came to know that the location of sanctioned Quarry was at a place called Parkal, 70 Km away from Kataram, as shown in the sanctioned Estimates. But, the Contractors in order to save money (for obvious reasons) wanted to utilize illicitly quarried stones from the forest area close to work sites.

After attending the monthly review meeting with the Collector at Karim Nagar, I had gone to Mahadevaaur for the field inspections. As it was Beedi Leaf season, I had sought exemption from attending the **Divisional Level Review meeting** to be held at Manthani the on the very next day, as the relevant information had already been furnished to the Collector. The Collector had agreed and permitted me to attend to my job in the field.

However, the next day I got intimation through Wireless from the adjoining Police Station that the Collector wanted my presence in Manthani for the review meeting. There was no possibility of contacting him over telephone as being interior forest area most of the time phones did not work. My jeep had gone out of order temporarily & needed minor repair at that point of time. Sub-DFO's vehicle was also not available. Hence it was not possible to make a move on the jeep. I was getting intimations repeatedly through Police Wireless for going over to Manthani. Under these circumstances I decided to proceed to Manthani on the Motor Cycle of FRO Mahadevpur as pillion rider.

On reaching the venue of the meeting in Manthani, chaired by **Sri T. Jeevan Reddy, the District In-charge Minister**, I was greeted with expectant eyes of all the Officers, as if everyone was anxiously

waiting for my arrival. After paying respects to the Honourable Minister, Peoples Representatives and the Collector I took my seat. The Minister, without wasting time straight away told me that in the Revenue Division there was no progress in the development works & that all the activities had come to a standstill because of me! I could guess that it had to do with stoppage of illicit quarry in Pratapgiri forest. But I requested the Minister politely to elaborate, expressing my amazement that how I could come in the way of the development works! The Minister there upon told me that all the Engineers and contractors are complaining that the DFO was not permitting them to quarry the stones and due to non-availability of stones the works could not progress. I was expecting this and was not surprized. I replied to the Honourable Minister that the sanctioned quarry was located in Parkal in Warangal District, which was outside my jurisdiction and hence the question of stopping operations in this quarry did not arise. The Minister intervened and told me that they were talking of quarry in Pratapgiri. On this I had to inform the Hon' Minister that the quarry in question was located in thickly forested area on a hillock in Pratapgiri Beat. I further informed that as quarrying was a non-forestry activity it was not permissible under the Act. I further informed him that if this quarry was absolutely essential, which has to be justified; prior permission from GOI would have to be obtained under FCA. The Minister enquired if the permission could be granted by the DFO. I clarified that since 25.10.1980; i.e., the date of promulgation of the Forest (Conservation) Act, 1980; the powers which could be exercised by the DFOs and other State level functionaries, had ceased to exist and for any non-forestry activity in the forests, GOI's prior permission is a must. The Minister was convinced and informed all others that obtaining GOI permission is a difficult task and that such permission would never be granted. I informed him that if proposal under FCA was submitted by any of the Engineers/User Agency giving full justification;

GOI permission could be obtained within a period of 3-4 months. However, probably the Minister was convinced that it could not be obtained and ignored my suggestion.

However, the Collector was not happy with the development. He had probably thought that I would buckle under pressure from the Minister and permit continuation of the illegal mining operation in the forest area. But as this did not happen, he seems to have taken it personally. I did not expect it from such a senior bureaucrat. I took leave from the Minister and sought the same from the Collector; he did not take it sportingly & bluntly told me, whispering into my ears that he did not expect such a forthright reply to the Minister from me. I reiterated my stand in the light of FCA. He then told me that **you did not know the powers of the Collector, I would show the same to you.** By now I could read his mind, so I told him Sir, I know your power very well, and that you would exhibit it by "requisitioning my vehicle" on some pretext and allot to some other Officer and took leave of him and returned to my camp at Mahadevpur.

The very next day Collector had shown his "power" (or misuse of power) and issued orders requisitioning my Jeep for allotment to an Executive Engineer of PR Department for "overseeing" the drought relief works. I informed him that this was Beedi Leaf season and a vehicle was very essential for the DFO to enable him to undertake tours to ensure quantity as well as quality of BL being collected, to ensure payment of wages to hundreds of labor during the season and to see that no pilferage or malpractices take place and requested him to cancel the order. In fact, the Govt. had issued orders to all the Collectors to allot additional vehicles to the DFOs during the BL season and not to requisition their vehicles for any

purpose during the BL season. But, being vengeful, the Collector did not bother for the Government's orders nor did he heed to my request; and I was forced to hand over my vehicle to the EE, PR.

I made a report of the above incident to my CF. He happened to come to Karim Nagar along with ACCF the very next day. I narrated the entire incident to both the senior Officers and requested them to intervene & report the matter to the Government; specially about the arrogance and high handedness of the Collector Karim Nagar in having requisitioned my vehicle during BL season. The ACCF tried to console me stating that **nobody listens to the Forest Officers in the Government**; and that the Forest Service was treated as a third rated Service and hence there was no point in complaining against the Collector to the Government. I felt highly anguished and frustrated with the response from the Senior Officer, as all along I was having the impression that the 3 AIS were equally important and equal in all aspects. This incident and response of the ACCF had totally shattered my dream and brought me crashing to the ground. It dawned upon me then that certain AIS were more equal than others. He advised the CF to "peacefully" resolve the issue at his level. The CF allotted a vehicle of a Sub-DFO in the Circle to me, depriving him of mobility, a stop gap arrangement. After 10 days I got my vehicle back. The relations between me and the Collector were not the same as earlier after this incident. But it gave me immense satisfaction that no Officer dared to take up any work in violation of the FCA in my jurisdiction as long as I remained in the position. It was, in a way, small but a definite victory of the forest conservation over the destructive development! (The author is a **former PCCF & Head of Forest Force** of Telangana State. He can be reached at Mobile No. +91 63000 30519 & e-mail id- pareshvyas22@gmail.com.) ♦

DESTRUCTION OF FORESTS IN WESTERN GHATS

By
B. K. Singh

At a time when we are facing the consequences of environmental catastrophes like droughts, floods, cyclones, storms, sea surges, corona pandemic etc the precious biodiversity of the Western Ghats is still threatened by a large number of projects in the pipeline. Even the project like Hubballi Ankola Railway line, which was rejected at least twice in the past, is being revived.

The rail contractors remain in background and bureaucrats and politicians are desperate in last two three years to reopen this case again and again. In October 2017, Chief Wildlife Warden (CWLW) and Additional Chief Secretary, Forests of Karnataka referred it to National Board for Wildlife for approval without taking State Board in confidence. Standing Committee of National Board for Wildlife in their 48th and 49th meeting discussed the subject and each time appointed committees headed by National Tiger Conservation Authority officers for conducting site inspection and making suitable recommendation. Both the committees rejected the proposal and the National Board did not reject it as they wanted to keep the project alive. They have then referred it to State Board.

On 9th January 2019 state board headed by Kumaraswamy CM took up the proposal; members did not accept the destruction of forests and unanimously rejected it. Ironically, the minutes of the meeting shows that the discussion on the subject is deferred for want of details. On 9th March 2020 state board headed by Yeddyurappa CM revisited the subject. Members again observed that the eco services

rendered by forests are priceless and rejected. CM did not sign the minutes and directed CWLW for convening another meeting on 20th March. It appears that there is no honesty in keeping correct minutes of the discussions.

Many board members did not attend hurriedly called 20th March meeting, however Jagadish Shettar, Shivaram Hebbar Ministers, R V Deshpande and Chief Secretary who are not the members of the board attended. Aggrieved by 9th March board decision, some of them issued public statement beforehand that the decision would be reversed in the next meeting. By their sheer weight, they silenced the legitimate board members and got the project approved.

When the rail proposal was reopened in 2008, Karnataka Government Principal Secretary Forests Abhijit Dasgupta examined all aspects in detail and rejected it. Of course, he was immediately transferred to insignificant post by Yeddyurappa Government.

In February 2011, Infrastructure Development department of the state had engaged Indian Institute of Science (IISc) for the impact assessment of environment and biodiversity on account of proposed rail project. Apart from suggesting Engineering solutions, IISc was requested to document medicinal and endemic species, corridors for wild animals, flow pattern for rivulets and rivers. IISc constituted a multidisciplinary team for the study and came up with a report to sacrifice 727 hectares of forests for the proposed 150 km long rail line. They recommended the project for implementation with mitigation measures such as growing

compensatory afforestation over 796 hectares non forest land, protecting north Canara forests using chain link to boost growing stock, implementing soil and water conservation measures, growing fodder reserves for wild animals etc. The mitigation measures suggested by IISc are not new to Forest Department. Similar measures have been tried out for many projects but have failed in all cases. We destroy forests with hundreds of floral and faunal species and argue that it will be compensated with artificial plantations of hardly four five species. Compensatory plantations of many projects have failed. There cannot be any mitigation for the loss of biodiversity rich natural forests.

It is IISc report, which is encouraging politicians and bureaucrats to reopen this case again and again.

IISc has also brought out another publication in 2018 interpreting satellite imageries which conclude that Western Ghats is losing forests with increasing pace and substantial change in land use pattern is bringing drought, flood, wild fire and storm inflicting misery to human being. They have always cautioned against deforestation. Except Hubballi Ankola rail project, IISc has never favoured destruction of such wonderful forests. It is irony to find that the report of IISc recommending Hubballi Ankola rail project has been accepted by Chief Wildlife Warden and Government of Karnataka, which was also conveyed to Union Ministry in October 2017.

Is this the way forward for a country at a time when our Prime Minister is seeking to lead the global efforts to address climate change? Have we lost the confidence in Science based advisory by IPCC that conservation of tropical forests is the easiest and best options to

minimize the impact? Western Ghats is one of the eight biodiversity hot spots in the World and the forests provide ecological services, water security for peninsular India and highly effective carbon sink.

We are the partner in Paris Climate accord of 2015 and to take the country on the path of being carbon neutral, Prime Minister has committed to re afforest 26 million hectares degraded forest areas by 2030. This is a very big challenge. Degraded forest areas are closer to human habitation and have been subjected to anthropogenic pressure in the past. We may not succeed entirely in our efforts to restock these areas. It is indeed a crime to lose such luxuriant forests of Western Ghats, when we are not sure of bringing similar greenery on degraded forest lands.

We have already lost 14000 hectares forests in Saravathi Linganamakki submersion, 6800 hectares for Varahi project, 1000 hectare for Talkalale reservoir, 1880 hectare for Chakra dam, 2000 hectare for Karnataka Power Corporation Township, 800 hectares for Saravathi tailrace project, 800 hectares for KPTCL projects and several thousand hectares for rehabilitation of evacuees from these projects.

Doubling of Londa-Madgaon railway line via Castle Rock is in final stage of approval. Widening of Belgavi Panjim road is in progress. Proposal to widen Sirsi Kumta road for connecting Belekeri port is in the pipeline. Also, up-gradation of Khanapur Alnavar Yellapur Sirsi Talguppa road to National Highway is a dream project of politicians. A proposal to divert 177 hectares forests for transmission line from Kaiga to Goa can be seen on the website of Ministry of Environment and Forests & Climate Change. A proposal to divert 200 hectares luxuriant

evergreen forests for Saravathy pump storage project is recently approved by State Board for Wildlife. These projects are ill conceived and more than the benefits to society the projects would cause harm. The valuation of intangible benefits from ecological services is often ignored and benefit cost ratio is shown to be highly inflated to favour the project in every case.

Of late I hear another rail project being surveyed in interior Western Ghat area for providing connection between Talguppa Sirsi and also between Sirsi and Havery. Catchment of important rivers like Bedti, Agnashini are likely to be impacted and thus impairing the requirement of agriculture and power production.

In the proposed power line project from Kaiga to Goa involving cutting down evergreen forests over 177 hectares, benefit is shown to be 715 times the cost. Total cost for losing 177 hectares forests is shown as Rs 6392.26 lakhs, whereas monetary benefit to society from the power evacuated through the transmission line is Rs 45,73, 955.95 lakh. It is then derived that benefit cost ratio is 715:1. The reconstruction cost on account of flood damages in Kerala and Coorg in 2018 was Rs 20,000 Crores and Rs 3,000 Crores respectively. Flood in these areas occurred in 2019 also. In this background it is distressing to note that detailed project report of Kaiga Goa transmission line has attached very little monetary value to 177 ha high quality evergreen forests. Union Ministry has not made any comment on such misleading report on their web site. When do we learn & correct valuation of forests and how long we mislead the public?

Such reports are used by politicians repeatedly to re-open the case. It is again being brought in for consideration in State Board for Wildlife. When the doubling of Londa Madgaon rail line

is on way, what is the need for another rail project? Destroying 800 hectare very dense and good quality biodiversity forests will certainly take its toll on environment, and the climatic catastrophes will hit the region with increasing frequency and will be more destructive.

While expansions of several road projects are in the pipeline, construction of a new road is proposed from Shishila Baripura near Kotgehara, Mudgere to Nelliyadi in Shiradi Ghats. It will open new forest areas of Mudgere and Shakileshpur taluks for plundering. Any attempt to open forests in eco-fragile Shiradi and Charmadi Ghats is environmental disaster. Landslides and land slips are very common in this belt and rightly High Court of Karnataka has stayed the construction of this road.

A proposal for 2000 MW Saravathy pumped storage project sacrificing 200 hectares evergreen forests of Shivamogga and North Canara districts in lion tailed macaque sanctuary is highly ill conceived. Ironically it is under active consideration of Union Government. World's largest solar park at Pavagada is now fully operational, why do we need to destroy forests for power generation?

River Cauvery takes birth in Coorg district of Karnataka and is in the centre of the Western Ghat. It is hilly district with undulating landscape known for luxuriant tree cover. A major portion of the district provides catchment for Cauvery and its tributaries. This catchment used to have one of the most magnificent dense tree cover, on the land in the past. French Institute Pondicherry has investigated the satellite imageries of the catchment in different years. Imageries of 1977, 1997 and 2007 have been compared and it has been concluded that there is a loss of 30% tree cover over a period of 30 years. Loss of

such wonderful tree covers deplete the water retention capacity of the area and during the rainy season more water flows with high velocity as runoff, carrying soil with it. This indirectly results in depleting the flow of water during summer months and siltation of reservoirs. Many perennial flows have become seasonal. The investigation of French Institute has further revealed that the loss of tree cover was in non-notified forest areas and the area under coffee cultivation has gone up by 22% in this period of study. How did we lose tree growth from non-notified forest areas? The tree felling on such land is regulated by Karnataka (Preservation) of Trees Act, where Deputy Conservator of Forests as Tree officer is empowered to grant permission for felling of trees and his controlling officer is the Chairman of the Tree Authority, where appeals are decided under the said Act. It can be inferred that forest officers have recklessly granted permission for felling of natural trees in the catchment of Cauvery for extension of coffee cultivation. Revenue officers and forest officers have colluded and trees have been removed from Pysari and Bane lands as well, without properly determining the rights of an individual on such land as well as trees. The confusion in land tenure in Coorg is fully exploited and timber merchants have prospered.

Some forest land in the catchment of the river have been granted for lease for thousand years with a permission to remove natural tree growth and raising plantation crop of rubber etc. Besides Forest Department has also cleared the natural forests and raised monoculture of teak and other fast-growing species for economically viable projects. Monoculture is again not conducive for retaining water in the subsoil and maintaining

the flow during summer months.

The catchment of the river Cauvery does have some stretches of grassy blanks interspersed with Shola forests. During the summer months, fire protection around Shola forests is very vital for keeping the flow of water stream originating from these forests intact. Repeated fire in the grassy blanks can scorch the Shola forests from all round, resulting in shrinkage of these forests. The flow of water originating from these streams depletes. The inflow in the reservoir during non-rainy season, therefore, diminishes. It is therefore necessary to preserve grasslands and Shola forests in the stretches of Brahmigiri sanctuary, Pushpagiri sanctuary, Bagmandala, Tal-Cauvery etc.

Conservationists, forest and wildlife experts, retired forest officers, and a large proportion of serving forest officers in the country are opposed to several such projects in the heart of Western Ghats. These forests are mothers of several rivers, and are also the 'biotic pumps' which helps in transport of atmospheric moisture from Arabian Sea and bring rains on the main land. Nature has been ringing the alarm bells as drought, floods, sea surges, cyclones, and now corona virus are becoming increasingly frequent and more destructive. The cost of destruction of these forests would be more than sum of the costs incurred in reconstructing the damages on account of each of the catastrophes.

It is high time that destruction of forests is suspended in Western Ghats or else life will slowly perish from earth. (The author is a Retired Principal Chief Conservator of Forests (Head of Forest Force) Karnataka and can be reached at E-mail ID bksinghretiredpccf@gmail.com ♦

IMPACT OF THE WESTERN GHATS ON DECCAN PLATEAU

By

Dr B Raghotham Rao Desai

Preamble:- A large 30.5 M (or 100 ft.) tall tree bears approximately two lakh leaves of all dimensions, and has the capacity to lift about 50,000 liters of water (from the soil-underneath) as an act of transpiration (into the atmosphere above, & around) during a single growing-season, while providing oxygen needed for 'one animal' or 'four human beings', while also effectively controlling the water-runoff from the rainfall (which gets percolated then inside the earth) — thus helping to recharge the groundwater. The surplus water, which still gets accumulated on the surface, is naturally fed to lakes & rivers (through streams and rivulets).

And a tree with an average lifespan of 40 years can absorb around 22 kilos of CO₂ per year and can sequester (or isolate/hide-away) **about a ton (or a thousand kgs) of it.** If the watersheds are carefully managed by maintaining the wetlands & forest areas therein, flooding will surely be less likely.

Any encroachment of forest-lands, or destruction of tree-growth, particularly in highlands, imperils and disrupts life & economy, substantially. Bells are already ringing in coastal areas of Konkan-belt (of Maharashtra and Goa), Kerala and Karnataka where traditional varieties of trees are being replaced by fast-growing tree-species (like *Silver-oak*, *Subabul*, thornless *Acacias* such as *A. auriculiformis* etc.). There is no denying of the fact that **we have hardly any respect for nature and biodiversity, resulting in climate-change due to the damage thus being caused**

to the environment. Climate change is not some distant scenario that will begin unfolding decades from now but a clear and present danger. It is not known who is to be blamed for the 'climate arsons' being perpetrated all across the globe — the infernos are burning millions & millions of hectares for the last one year, killing dozens of people & countless fauna and forcing hundreds of thousands from their homes: whole of pristine vegetations and townships having been ruined by the blazes, pumping out tones of noxious fumes that have hung in the air for weeks & months, blocking out the sun for days and making breathing extremely difficult. Further, deforestation, uncontrolled urbanization and increasing-pollution are causing serious harm to the health of all living beings. Reputable scientists around the world are almost unanimous in their belief that the world is getting warmer because of human activity. This man-made climate change amplified droughts (which dry our regions, creating ideal conditions for wildfires to spread out-of-control) and inflict unprecedented damage. We better understand that the damage from climate change is already here.

While economic development is important, it is also essential to **ensure that development is sustainable, never proving as a catalyst for the cataclysm (or disaster).** Renewable energy, water conservation and afforestation must be promoted at all costs, by drawing up a detailed roadmap-of-action for each of the above, and their implementation must be monitored by

assigning responsibilities to the appropriate authorities — policy-direction must come from the top, and communicated effectively down the line.

Fact File: Forests of Western Ghats are nicknamed as 'Water Towers of Peninsular India', because they get (on an average) anywhere between 800 - 2000 mm of rainfall per year. **Conservation of these forests should necessarily be the starting point of any long-term strategy,** to counter the destruction of the Western Ghats. Evidently, any damage to these hills & (most importantly) to the forests they carry, is sacrilege, and is sure to threaten life and livelihood of as many as one-third of India's population, as also about the same extent of animals & wildlife (in Maharashtra and the four southern states of Karnataka, Goa, Kerala & Tamil Nadu). Political and social pressures having already pushed the ecology to the edge in the Ghat region running through Karnataka, even any small changes in the highly sensitive regions all along the Western Ghats will have larger adverse impacts — including diminished water flow to the lakes and in the streams, rivulets and rivers.

Tree-planting should neither be confused with afforestation nor do such trees substitute for the forests. To put it simply, **forests are undisturbed assemblages of trees and undergrowth** — providing a protective canopy that lessens the impact of raindrops directly reaching the land and arresting soil erosion. The layers of leaves

(shed by the trees) prevent runoff, while allowing maximum water to percolate into the soil; and roots simultaneously helping to hold the earth in place. Dead and decaying vegetation when decomposes over a period of time into humus & organic matter, also helps to hold the water, while acting as a nutrient-bank for the soil. **Trees, with their cavities and buttresses, provide habitats to animals, reptiles, birds, and insects.**

Conclusion: The Western Ghats — also called Sahyadris — are divided into northern (640 kms), middle (640 kms) and southern (the rest) sections. Likewise, the Deccan Plateau is divided as North Deccan (Satpura Range & Maharashtra Plateau), South Deccan (Telangana and Karnataka) and Eastern Plateau (Chota-Nagpur, Mahanadi Basin and Dandakaranya).

All progress being incumbent upon food & energy security, which in turn linked to water availability and storage, the per capita storage capacity in the southern states — which mainly depends upon the monsoon-fed rivers — is below 100 Cu. M (as 1 mm of rain on 1 sqm of area leads to collection of 1 liter of water), when compared to All India figure of 209 Cu. M. So, **the situation calls for planning water-retention-capacity of the hills of the Western Ghats, which are the main magnets for clouds and consequent precipitation.** These hills are spread over 1.6 lakh sq.km. and form the complex riverine drainage system of South India. ♦

*"Before you call yourself a Christian, Buddhist,
Muslim, Hindu or any other theology,
learn to be human first."*

Democracy & Presidential Elections in USA and India: A Comparison

By
Dr. K. Tirupataiah

Aspect	USA	India
Democracy	The World's Oldest Democracy Parliamentary Democracy	The World's Largest Democracy, Parliamentary Republic
Republic	Constitutionally both Democratic and Republic. Democratic because People hold power and Republic because its Rule of Law that prevails	Democracy from 15 th Aug 1947 and Republic since 26 th Jan 1950
History	Independence from British colonies	Independence from British Crown
Status	Most powerful head of the state as well as Head of Govt. in the World, Chief Executive with direct power unlike Monarchs	First Citizen, Head of State, works through PM (Head of Govt). More Symbolic like Monarch of Britain and wield indirect power
Residence	Built after Independence, White House, much inconspicuous compared to Capitol Hill/House	Built before Independence, Rashtrapathi Bhawan, Monumental, reflects aristocracy of the British, overshadows Parliament bld.
Main Role	Executive. Activities done under the seal directly, consulting the Houses is not mandatory. Idea was to break the monopoly of the majority in the Legislature	Protector of Constitution and Rule of Law, Activities carried out under the Seal but by the Executive, Cannot do anything on his/her own without consulting the Executive
Powers-Legislative	Full powers in Federal legislature, has veto power to reject bills in which case the house has to pass it again with 2/3 rd majority, line/item approval power in case of not accepting a bill in totality	Legislative powers in consenting to bills passed in Parliament, can send back bill once but not a second time
Powers-Executive	Executive Orders, Appointments of Ambassadors, Cabinet etc in consultation with Senate majority	Only on recommendation/ consultation with the Council of Ministers

Powers-Judiciary	Himself nominates Federal Judges subject to ratification in the Senate	Appointment of Judges to SC and HCs on the Advice of Collegium and CJI
Membership	Not a member of either house of representatives or Senate	Not a member of either houses of Parliament but must be eligible to the LS
Time of Election	Elections to all seats of House Representatives and 1/3 seats of Senate simultaneously held with Presidential election	Presidential election has no link with elections to MPs of LS and RS
Coattail effect	Performance of a Presidential candidates has great impact on election to house of representatives, so President in a sense is leader of Party in Power	President is elected by already elected MPs/MLAs so they (majority party) actually influence who becomes President
Electoral College	Indirect election by "Electors" elected by voters in each state	Indirect election by MPs of LS&RS and MLAs of State Assemblies and UTs
Election Authority	Elections are decentralized and each of the 50 states have their own Rules. Each state employs an agency for counting and the House ratifies election of President of USA	Under complete superintendence of The Election Commission of India
Willingness to contest	Has to register with each of 50 states for contesting	Only 50 electors as proposers and 50 as seconders, required. Single place/time nomination
Term	Four Years Limited to two terms	Five Years No limit on terms

Note: In a Presidential system of Democracy, the President is elected directly and hence, he has no responsibility to the Legislature or Legislature cannot dismiss the President. However, there is a process of Impeachment available. Most North American countries have Presidential System. The Indian case is one of a mix of British Legacy where the President is more a symbolic head while the Prime Minister, elected directly by people, is the Chief Executive. (The author is a retired PCCF from Telangana State and can be reached on e-mail ID tirupataiah.tsfa@gmail.com) ♦

"No man is a failure who has friends."

KANHA NATIONAL PARK

By
V. SANTHASEELA BABU

Kanha National Park is nestled in the Maikal range of Satpuras in Madhya Pradesh, the heart of India, that forms the central Indian Highlands. The National Park is popularized as the Tiger reserve and interestingly is one of the finest Wildlife areas in the world. Spreading across two revenue districts, the Mandla and the Balaghat, Kanha National Park was declared as Reserve Forest in 1879 and enhanced as a Wildlife Sanctuary in 1933. Its position was further upgraded to a National Park on 1st June 1955 and declared as a Tiger Reserve in 1973. The Kanha National Park is an IUCN Category-II National Park spread across an area of 940 sq.km in the Maikal chain of hills. By bringing up the buffer and core zone areas all together, the Kanha Tiger Reserve has a total area of 1945 sq.km. The Park is maintained by the Madhya Pradesh Forest Department.

The landscapes and the surrounding luxurious meadows along with the wooded strands and the dense maroons of forests offer magnanimous sightseeing experiences for the Nature lovers. Making the land more beautiful and adorable, the crystal-clear streams amidst the dense jungles cleanses the surroundings and makes the wildlife unrivalled. This vivacious land has been the source of inspiration for Mr. Rudyard Kipling, a famous writer and author for his outstanding creation- "The Jungle Book".

The Kanha National Park is the ideal home for wide ranges of wild creatures; right from the robust Tigers to the most populated Barasingha and the countless species of Plants, Birds, Reptiles and Insects. This reserve has fascinated many travelers around the corners of the world with its well-developed infrastructure specially meant for them. The best

location here to enjoy the most is the Bammi Dadar, also known as the Sunset Point.

Kanha Tiger Reserve, also known as Kanha-Kisli National Park, is one of the most soughtafter Tiger Reserves of India and the largest National Park of the state of Madhya Pradesh. The present-day Kanha area is divided into two protected areas, Hallon and Banjar, of 250 and 300 km, respectively. Together with a surrounding buffer zone of 1,067 sq. km and the neighbouring 111 sq. km Phen Sanctuary, it forms the Kanha Tiger Reserve, which is one of the biggest in the country. This makes it the largest National Park in central India. The Kanha National Park is surely a paradise for the wild species that brings the natural habitat for them. A location which is filled with large varieties of fauna out of which the jungle is best known for Barasingha, the swamp deer, and is famously called 'the jewel of Kanha'. The Tiger tour is perfectly a great option for the nature lovers in Kanha.

The Park hosts Bengal Tiger, Indian Leopard, Sloth Bear, Barasingha, Indian Gaur, Dhole etc; animals. It is also the first Tiger Reserve in India to officially introduce a 'Mascot', 'Bhoorsingh' the Barasingha. The name "Barasingha" literally means "twelve-tined". A fully adult male can have 10 to 15 tines, though some males have been found to have up to 20. Antlers of Barasingha are smooth, the main beam sweeping upward for over half the length before branching repeatedly. The scientific name of Barasingha found in Kanha National Park is *Rucervus duvaucelii branderi*. (Old name: *Cervus duvaucelii branderi*). Kanha is the first Tiger Reserve in India to have an official Mascot. The Barasingha or Swamp Deer (*Rucervus duvaucelii branderi*) is

the state animal of Madhya Pradesh and is found only in the Kanha Tiger Reserve. This Swamp Deer has been chosen as the Mascot in order to present it as the spirit of the reserve and spread awareness to save it from probable extinction. It is an endemic variety of Deer chosen as the Park's mascot. 'Bhoor' means tawny/golden and 'Singh' means antlers. The Kanha Tiger Reserve, spread over Mandla and Balaghat districts, is the only place in the world where we can see this animal in wild. In 2016 it was estimated that there are about 700 animals. Swamp Deer also exist in Kaziranga National Park and Manas National Parks of Assam and it is a different sub species *Rucervus duvaucelii* and not *branderi*.

Flora: The types of forest area found in the Kanha Tiger Reserve are:

Moist Peninsular Sal Forests (3C/C2)

Southern Tropical Moist Mixed Deciduous Forest (3 A/C 2a)

Southern Tropical Dry Deciduous Mixed Forest (5 A/C-3)

Kanha National Park is the one of the woodlands in the country that brings so much of vividness in nature and is amazingly a home to over 200 species of flowering plants. It is a low land forest that brings a mixture of Sal (*Shorea robusta*) and other mixed forest trees, mingled with meadows. The moderate and favorable climate and varied topography supports the growth of a rich and varied flora in the Park. Over 70 species of trees are found in Kanha.

Truly considered as the Kipling's world that powered him with such magnificent imaginations, Kanha Tiger Reserve has numerous vegetative attractions around the vicinity for a perfect habitat for the jungle beings. The highland forests of Kanha are Tropical Moist Dry Deciduous type and Bamboo (*Dendrocalamus strictus*) on slopes can be discovered. The most popular Indian Ghost Tree, *Sterculia urens* (Kullu) can also be witnessed in the deciduous area.

The major Flora discovered in Kanha Reserve include *Shorea telura*, *Terminalia elliptica*, *Lagerstroemia parviflora*, *Anogeissus latifolia*, *Diaspyros melanoxylon*, *Butea monosperma*, *Pterocarpus marsupium*, *Madhuca latifolia*, *Phyllanthus emblica*, *Cordia myxa* etc; and Bamboo. Besides, many species of climbers, herbs and grass can also be found here.

Fauna: Kanha National Park is the land of both the Herbivorous and the Carnivorous animals. Variety of animals can be found in abundance at this amazing reserve. It is the only habitat of the rare hard ground Barasingha, often referred as "the Jewel of Kanha". The major fauna found in the vast serenity of the Kanha National Park include, among Mammals, Tiger, Panther, Chital, Sambar, Barasingha, Black buck, Barking deer, Chousingha, Gaur, Langur, Wild pig, Jackal, Sloth bear, Wild dog etc. Among the Reptiles, we find Python, Indian Cobra, Russell's Viper, Indian Krait, Common Rat Snake, Common Skink, Indian Monitor, Fan Throated Lizard and Indian Garden Lizard etc. There are variety of Fish among which Giant Danio, Common Rasbora, Mud Perches, Brown Snakehead and Green Snakehead are commonly seen. As for as Birds, the Reserve brings around 300 species of Birds and the most commonly seen Birds are the Black Ibis, Bee-eaters, Cattle Egret, Blossom-Headed Parakeets, Pond Heron, Drongos, Common Teal, Crested Serpent Eagle, Grey Hornbill, Indian Roller, Little Grebes, Lesser Adjutants, Lesser Whistling Teal, Minivets, Pied Hornbill, Woodpecker, Pigeon, Paradise Flycatchers, Mynas, Peafowl, Red Jungle Fowl, Red Wattled Lapwing, Steppe Eagle, Tickell's Flycatcher, White-eyed Buzzard, White-breasted Kingfisher, White-browed Fantail Flycatcher, Wood shrikes and Warblers etc..

Thousands of Bird watchers and Ornithologists get attracted to this amazing Bird paradise. The mixed forests, Bamboo and the grassy forests are the

perfect spots for bird watching in Kanha National Park. Amazingly, some attractive water birds can also be found near the reserve's rivulets and at Sarvantal. (A pool that is frequented by water birds and area front of the museum.)

Tips for Wildlife Viewing in Kanha: Watching wildlife is really a rewarding experience in any Protected Area and can be challenging too when we get a close up view of the jungle beasts. Watching these creatures is exciting as well as quite riskier and thus it is always advised to see that a guide or any expert accompanies us.

Luckily, there are also some important tips that can help to thaw into an exciting and closer Wildlife watching experiences.

- Pick perfect and comfortable clothing while moving around the jungle. It may be a head to toe camouflage attire but the material should be soft and comfortable for easy movement.
- Pay attention on your movement while watching wild animals. Your intentions should be to watch and appreciate their beauty but not to disturb them with your noisy activities.
- You must carry every important necessary item while making a jungle tour by keeping in mind to avoid any heavy luggage. Thus, be selective while picking your goods and make sure only the most important things should be with you to avoid congestion while touring.
- Be patient and flexible while noticing any species. It may take some time for you or if you want some photography you should avoid committing any kind of mistakes that can disturb those creatures.
- If you love photography, it is essential to respect your subject where you are focusing and should patiently observe its movements without disturbing it.

Tips for watching Birds in jungle during Wildlife tour:

- Keep your constant eye on the Bird since it is the only creature that can suddenly get vanished from your sight anytime.
- Listen calmly the voice and song of any specified bird so as to identify its species.
- Observe carefully to estimate the general size and shape so that you can easily categorize it.
- Make a careful distinction of the color and pattern of the birds, their hood shape, the size and shape of their beaks and wings and of course if possible, their flying style and movements.
- Check their feeding habits and their style of eating.
- Describe the habitat, region and climate where the birds can be commonly found.
- The most important thing is to record all these observations so that you can have the best documentation for studying birds.

Jungle Safari in Kanha: A trip to Kanha Reserve directly takes you to the widespread arena of the lush habitat of wild creatures. With Elephant and Jeep safari an encounter to all these species is really generous and worthwhile. With jungle safari you can take a closer look to the Wild animals and can capture their magnanimous images in your cameras.

Jeep Safari: For Jeep Safari, four Wheel Drive open Jeeps are the best way to observe wildlife at the thick & lush green forests of Kanha National Park. Groups of Tourists, individuals accompanied by an experienced Naturalist are allowed into the Park at fixed timings during early morning and afternoon. The jeep has to follow a fixed route and leave the Park by the end of the appointed time. At Kanha National park in a single day Jeep Safari is done two times. One in the early morning hrs and the other

one in the late afternoon by using a six-seater open vehicle. In each vehicle 6 passengers are allowed to travel along with one Naturalist and one driver. Before entering into the National Park one has to complete some necessary paper formalities at the entrance gate regarding Vehicle details, Naturalist details, Visitors' details etc. All these formalities take almost 15 to 20 minutes.

There are four different zones at Kanha National Park for doing the Jeep Safari rides. Kisli, Mukki, Kanha & Sarhi. The entrance ticket you can book online or through travel agents or tour operator or if available you also can get this from the booking window at the entrance gate of the National Park. Vehicle charges & guide fee are the other expenses which are separate than the entrance ticket. Limited no. of vehicles are permitted to enter inside the forest in each shift. It is advisable to book the entrance ticket well in advance to avoid any chance of unavailability of Safari seats.

Procedure to be followed while visiting a Protected Area: Visitors are advised to drive slowly and with care as the driving at the National Park is different from that of driving on city roads or on highways. A Deer on the road or a Tiger by the roadside, if without interruption provides more pleasure than the one that runs away. Sighting wild animals in Kanha is exciting. All the animals at the National Park are wild. Getting close to them is not only prohibited, but also proves dangerous. Respect the wild animals and always maintain a safe distance from them. Remember that you are in their home and they get the first priority. Bright colors can disturb the animals and therefore during safari rides for the National Park one has to wear clothes that are ideally be in muted jungle shades of Beige, Brown, Green and such like, preferably neutral and earth colored clothes. Keep your all senses open during Park Safari for better wildlife viewing and avoid loud conversation which can disturb the animals besides reducing the possibility of sighting animals. Always

take services of officially authorized guide during game drive as they are local, experienced & well familiar with the surroundings and can take you to the right places in right time to see the exceptional Wildlife of Kanha National Park.

Vehicles Permitted to enter inside the National Park in each shift: As already mentioned above, for organizing Safaris, the Park is divided in to 4 zones viz; Kisli Zone, Kanha Zone, Mukki Zone and Sarhi Zone. Both during each of the Morning Shift and the Afternoon Shift, in Kisli zone 18 vehicles, In Kanha zone and Mukki zone 40 vehicles and in Sarhi zone 27 vehicles are permitted.

The Kanha National Park remains open for visitors from 16th October to 30th June.

Elephant Safari in Kanha National Park: This National Park is being supple with great Wildlife tour by enjoying the Safari adventure and if one can have the Elephant Safari the joy of sighting the animals just doubles. This is the only medium where you can have a closer and safer look at all kinds of deadly or predatory species including the Tigers. The Kanha reserve is really renowned for the most adventurous Elephant Safari which is being regarded as the 'Star attraction' of the jungle. Elephant safari helps the visitors to access the places inside the Park which are not accessible by jeeps. The easiest and most common way to enjoy Elephant Safari is to involve yourself in a Tiger Show program. Tiger Show is a program organized after successful sighting of Tiger by trackers on Elephants. Tiger Show can be done during Morning Safari only. During Tiger Show, at a time up to four people are taken close to Tiger and shown from Elephant back for 10 to 15 minutes.

At Kanha afternoon shift of Jeep Safari remains closed for visitors on Every Wednesday. Morning and Afternoon shifts remain closed on Holi festival (In the month of March)

Contd.. on page No. 35

We produce black - But our views are Green



Cultivation near Reclaimed Dump



Settling pond / Summer storage tank

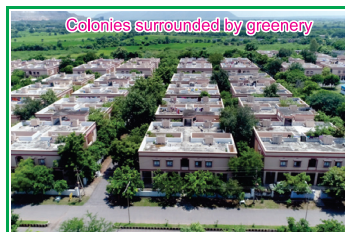


Eco-Friendly Park



Award in recognition of eco-friendly measures

- Pollution control and Soil Conservation Measures.
- About 5.50 crore saplings were planted in Singareni spread over area.
- Artificial forest covers to OC Dumps.
- Avenue plantation in colonies and roads.
- Eco-friendly parks developed in colonies.
- Sand manufactured from OB.
- STP/ ETP at all Colonies / Establishments.
- Efforts of Singareni were rewarded by State and National level awards.



Colonies surrounded by greenery



Reclaimed OB Dump



THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)

**MASCOT OF KANHA
NATIONAL PARK**



BARASINGHA IN KANHA NATIONAL PARK





Please see page No. 54 for details

GreenAP

Mobile App



- With a vision to increase green spaces and to improve the quality of life of the people, **Andhra Pradesh** Government has come up with a unique initiative with the support of APG&BC in launching **GreenAP** mobile application.
- This app helps in bridging the gap between consumers and the vast vendor eco-system across the country who are dealing with green products and services.
- Consumers will now have access to vendors to procure plants of various kinds including indoor, exotic, lawns, roof top gardens, vertical gardens, etc.
- With this mobile app they will have access to the products like pot vendors, aquariums, landscape designers and many more.

Salient Features



Vendor Directory



News



Enquiries



Forums



Events

Consumers can select vendors who are closer to their city or town for any purchase by browsing through the hundreds of profiles available in the **GreenAP** mobile app. Consumers can access vendors via WhatsApp, SMS or Phone.



Download **GreenAP** app today!



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Google Play



Download on the
App Store



For more information, please contact our help line number: **+91 7997650835**

Continuation from page No. 30

The following are certain details required for Reservation of Safaris.

Full Name of every visitor, Age & Gender, Nationality, Identity proof. Visitor is required to carry the same ID proof in original at the time of visiting the National Park.

Transportation and access: The Jabalpur Airport is at a distance of 175 km. Jabalpur is major railway stations with good train connectivity across India. From Jabalpur, the best way to travel is via Mandla, which has a Tourist Taxi service to the Park. One of shortest road route is Jabalpur-Bargi Dam-Ganhsor-Thanwar Dam-Chiraidongri-Kanha National Park.

Ecosystem Valuation: An economic assessment study of Kanha Tiger Reserve estimated that the Tiger Reserve provides flow benefits worth Rs. 16.5 Billion (Rs. 0.80 lakh / hectare) annually. Important Ecosystem services from the Tiger Reserve include gene-pool protection (Rs. 12.41 Billion/year), provisioning of water to downstream regions (Rs. 558 million) and provisioning of fodder in buffer areas (Rs. 546 million). Other services included recreation value (Rs. 384 million), provision of habitat and refugia for wildlife (Rs. 319 million) and sequestration of carbon (Rs. 219 million).

Other Locations nearer to Kanha National Park:

Apart from Kanha Tiger Reserve, there are many captivating locations that can bring much attention to the Nature lovers while making an enthusiastic trip to the Kanha Tiger Reserve.

List of Places that bring Alluring effects to the Tourists:

Bandhavgarh: Barely 250 kms away from the Kanha Tiger Reserve, Bandhavgarh is located which is the original home of the White Tigers and was once the hunting ground for the Maharajas of

Rewa. Bandhavgarh which is famous for its National Park and the majestic historical Fort, still dominates the high hills rising out of the forest. It is the only maximum elevated zone around the Bandhavgarh area that brings the fantastic Jungle views and the Wild animals, especially the Tigers can be spotted very easily. Earlier the forest around the Bandhavgarh area was being maintained as Shikargarh, or game preserve of the Maharaja of Rewa when the kings killed almost more than 100 Tigers in the area and today the same place is known for the best region for Tiger tours and its conservation projects.

Pench Tiger Reserve: This place is just 357 kms away from the Kanha National Park and can be reached within 5 hours of drive and is nestled at the lower southern ranges of Satpura hills bordering Maharashtra. You can find the original setting of the Rudyard Kipling's "The Jungle Book" at Pench Tiger Reserve and its neighborhood area. The whole area of the Pench Tiger Reserve is spread over an area of 758 sq. km.

Tadoba: Tadoba highlights the oldest National Park in Maharashtra and is a compact National Park of about 120 sq. km. area at an altitude of 200 m. The Wildlife enthusiasts can find this place as much as heaven and have christened this place as the 'jewel of Vidarbha'. The name Tadoba has been derived from the local deity of Gond tribes as 'Taru' who was killed in an epic fight with Tiger. It is one of India's 28 Tiger Reserves and consists of variety of Wild species with around 50 Tigers.

– Source: Internet &

Kanha National Park Website

Author's Note: I am happy to inform all the readers of Vana Premi that, incidentally this is the 60th article written by Mr. V. Santhaseela Babu published in Vana Premi. ♦

Fire in the heart sends smoke into the head.

Green Quiz Championship- December 2020

Quiz Master: Dr K. Tirupataiah

This month's quiz is more focussed on "General Environment matters"

1. The great Birdman "Salim Ali" was tasked to recommend a bird to be named as National bird of India. Which bird did he recommend? _____	2. Which is the National Aquatic Animal of India? _____
3. Buddha attained Enlightenment under the Peepal tree. Head of which other Sect also gained enlightenment under Peepal tree? _____	4. During which event was the Tiger chosen as the National Animal? _____
5. Two animals belonging to the genus "Pan" share 98.7% of DNA with human beings. Name the two animals. _____ & _____	6. A genetic mutation in Zebra Fish results in its small ears. What name is given to this mutation? _____
7. The train that runs between New York city and Toronto has an interesting name of a symbol that is found in the Canadian flag. What is it? _____	8) The World's largest Natural Bridge was discovered in 2016 on which River? _____
9. What is the name given to waterfalls that drop vertically? _____	10. India's largest walk through Aviary is located near _____city
11. These ancient rocks found in Lal Bagh Gardens; Bengaluru are Millions of years older than Dinosaurs. What rocks are these? _____	12. What is the study of physical features of water bodies (change in size overtime) called? _____
13. Rotomaireshenua (Blue Lake) is the clearest water lake with visibility of 250 feet. In which Country is this lake located? _____	14. Which colour originally derived by crushing metamorphic rock (Lapis lazuli) is used to depict the Robes of Virgin Mary? _____
15. Hydrangea plants usually give White flowers. But a factor in the Soil in which they grow gives it Blue, Purple, Pink or Red flowers. What factor is it? _____	

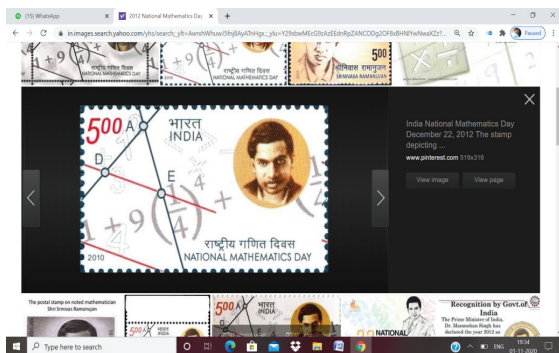
(The author is a retired PCCF from Telangana State and can be reached on e-mail ID tirupataiah.tsfa@gmail.com. He is also Winner of the QUIZ competition held as part of All India Forest Sports Meet at Raipur, Chhattisgarh, January 2019)

Please see Page Number 44 for answers

SRINIVASA RAMANUJAN – A POLESTAR OF MATHEMATICS

By
Akshaya Kumar Nayak

INTRODUCTION: An insignificant flower in the green woods to what extent short lived it may be, when blossoms, emitting its eternal sweet fragrance overwhelm enthralling the people surrounding causing overjoyed on overrating the elegant one. Likewise goes the story of a lad Chinnaswamy (or small god) Srinivasa Ramanujan Aiyangar, the great wizard of mathematics.



Mathematics can be regarded as the mother science having its role in studying quantity, numbers and space. Applied mathematics, branches of it, is an essential tool in many fields like physics, chemistry, biology, engineering, medicine and social sciences like economics, psychology, sociology, statistics and game theory, etc. which also creates inspiration for use of new mathematical discoveries. It is a glorious fact that in ancient times Indians had adequate interest in study of various fields of mathematics who led discovery of algebra and decimal systems. Many astrologers and mathematicians like Aryavat, Brahmagupta, Mahavir, Bhaskara born in this holy land of Bharat have kept up such rich and high tradition in the 20th century. The world-famous great wizard of mathematics, Srinivas Ramanujan is such a burning example.

BIRTH AND CHILDHOOD: The child Srinivasa Ramanujan Aiyangar was born on 22 December 1887 at his maternal grandfather's house at Erode by the river Kaveri in Tamilnadu. Special worships and prayers were made by his mother Komalattamal to propitiate the goddess *Namagiri*, the deity of the Namakkal temple and Komalattamal was blessed with a son Ramanujan who was treated as the son of the goddess Namagiri keeping his nick name Chinnaswamy (small god), While performing her household chores she was always singing or humming religious hymns, couplets or verses which her beloved son listened with fervour and attention, most of them were imprinted in his memory. Ramanujan could also recite passages and *Slokas* from Sanskrit and Tamil with great inner satisfaction and delight. Ramanujan's father, Srinivasa Iyengar belonged to a high-class family was known for his honesty, integrity and diligence. He was a *Gumasta* (accountant) in a cloth merchant's shop at Kumbakonam at a monthly salary of Rs 20. Ramanujan, as a child was quiet and thoughtful. He was not given much scope for playing outside or roaming about with the street urchins of his age. He was much impressed with and was fond of the "*Kural*" (The great work of the Tamil savant, Thiru Valluvar) and on his moral principle on *Dharma*, self-control and renunciation. He believed in not swerving from the path of *Dharma*.

EARLY EDUCATION: At the age of five in 1892 Ramanujan's father got him admitted into the local "*Pial*" school at Kumbakonam (A *Pial* is a plinth level long platform running along the front of a house). There he learnt Tamil alphabets and elementary arithmetic. He often gazed the sky and asked his teacher subtle questions about the size and distance of stars in the solar system.

In order to overcome the acute hardship to manage the family with the only monthly salary of Ramanujan's father, his mother Komalattamal kept few students in her house as paying guests and had some extra income. At the age of 10, Ramanujan stood first in the whole district and got scholarship in primary education which enabled him to get a half free concession in the school. The 10-year-old Ramanujan, very often used to spend time with two neighbours. They were BA students who observed his deep interest and attraction towards mathematics. This created curiosity in them who injected the idea of Geometry, Algebra and Trigonometry in the child's mind. Strange enough, Ramanujan, very easily and quickly grasped all these subjects. When he was in third form while the teacher was explaining the student that any quantity divided by itself was equal to unity he stood up and asked "if zero divided by zero was also equal to unity?" By this time, he had mastered the properties of the three progressions. While in fourth form he completed Loney's Trigonometry and had already proved Euler's theorems. This BA student used him for solving difficult problems.

Ramanujan joined the Kumbakonam Town High School in January 1898. From those days his hidden brilliance in mathematics developed. Once his senior class student asked a difficult question to solve the problem of square root of $X+Y=7$ and square root of $X+Y=11$; within half a minute he gave the correct answer which was $X=9$ and $Y=4$. The Headmaster, knowing his special ability, entrusted Ramanujan of class-X to prepare the time table to keep all the teachers engaged which was too tough a job for the teacher, and got the task done by him. He was awarded special prizes for proficiency in mathematics and rewards of merit when he was in class 7, 9 and 10. He discontinued working on slate and recorded his findings and concepts on sheets of paper, later known as his "Note Book".

HIGHER EDUCATION: Ramanujan passed the

Matriculation Examination of the Madras University in December, 1903 with first class and high rank which won him the Subramaniam scholarship for FA class. He was also awarded the Sri V Ranganaditya Rao prize of Kumbakonam School in 1904 for brilliance in mathematics. He joined in the 1st year of FA in the local Govt. College with subjects of English, Mathematics, Physiology, Roman, Greek history and Sanskrit. He spent most of his time in pursuit of mathematics. As a result, he failed in the annual examination and lost scholarship. His father got him admitted in Pachaiyappa's College, Madras. In the examination of December 1907, he again could not succeed. His father didn't like him always indulging in mathematics and not earning for his livelihood. But Ramanujan used to hide himself under a cot and silently engrossed in his mathematical pursuit. Mathematician Prof S.R Ranganathan observes: "Inner light began to lead him and the joy of cultivating the region of knowledge lighted up by it began to spur him on and on." The depression due to failure in FA examination or getting employment, poverty and penury could not repress it. Magic squares, continued fractions, hyper geometric series, properties of numbers – prime and composite, partition of number, elliptic integrals, etc. everything had to be done and discovered by him de-novo.

PERIOD OF STRIVING: Deteriorated financial conditions of the family, Ramanujan's inability to pass in FA examination and his continued mental engrossment in mathematics disappointed parents who decided to get him married to divert his attention enabling him to lead a normal social life. On 14th July 1909, he was married to a beautiful bright-eyed girl of 11 years. Ramanujan experienced some change after the marriage and did not like to be a burden on his parents, at the same time he was to struggle hard to become self-supporting along with providing adequate care for mathematics.

In 1910, he came to Madras in quest of service. He

met Prof V Ramaswamy Aiyar, a deputy collector who had established the “Analytical Club” of lovers of mathematics which was subsequently renamed as “Indian Mathematical Society” (IMS) who helped Ramanujan get a job in AG’s office. But he had to quit it as it was a temporary one. Now jobless, Ramanujan fell ill due to improper nourishment and returned home. After recovery he returned to Madras and resorted to private tuition. Collector Dewan Bahadur R. Ramachandra Rao, Honorary Secy. of IMS who knew the research work on Elliptical Integrals and Hyper Geometric series and his theory of Divergent Series which was not then announced to the world and that he wanted a pittance to live on, helped him get a post of clerk in the Madras Port Trust (MPT) at Rs 25 per month. Ramanujan was greatly happy to stand on his own feet. His remarkable contribution was a paper entitled “Some Properties of Bernoulli’s Numbers” was published in the journal of IMS in December 1911 and two more papers in 1912. Prof C.L.T. Griffith, Principal of Madras Engineering College, a well-wisher of Ramanujan, sent his discovered theorems and formulae to Prof M.J.M Hill of London University who in his reply stated that Ramanujan had been puzzled with the very difficult subject of Divergent Series, as a result, some of the theorems on theory of Prime Numbers, though brilliant, was completely wrong. But his mastery of some other areas of mathematics was unequalled by any contemporary mathematician.

RECOGNITION AND JOINING AS A RESEARCH STUDENT:

At the suggestion of his friends, Ramanujan wrote about his work and sent to two eminent Professors of Mathematics at Cambridge who returned his letter without any comment. Subsequently he approached Prof G.H. Hardy, F.R.S. Cayley, Professor of Mathematics at Cambridge University who was highly surprised with the note-worthy papers and made magnanimously a historical response making a turning point in the life of the wizard, putting India in the Mathematical

Map of the world. Ramanujan, who was also very religious, had written his first letter to Prof Hardy on the holy Makar Sankranti – a very auspicious day in the Indian calendar on 16th January, 1913 introducing him and his laborious work on mathematics. He enclosed 100 or more of his theorems and his intention for publishing if considered to have any value and sought his esteemed advice. This letter stormed the Mathematical Cambridge. Recognizing the genius Prof. Hardy on 8 February 1913 promptly acknowledged Ramanujan’s letter and paid a tribute for his distinguished work. He advised him to get acquainted with Prof. E.H Neville, Fellow of Trinity College, presently at Madras delivering a series of lectures on Differential Geometry. Immensely delighted, Ramanujan conveyed his gratitude to Prof. Hardy. On the recommendation of Prof. Hardy and other dignitaries and the syndicate of the Madras University, Govt. approved a monthly scholarship of Rs.75 for Ramanujan’s research work which was communicated to him on 9 January 1913. MPT also granted 2 years leave to Ramanujan who joined as the first research student of the university on the same day. Ramanujan met twice Prof. Neville who went through his enthralling research work and was surprised greatly. As per him: “Being unaware of the recent advances made in mathematics, he was, beginning every investigation at the point from which European mathematicians had started 150 years before him and not at the point which they had reached in 1913.” Prof. Hardy was eager to call Ramanujan to Cambridge.

AT CAMBRIDGE: With the sincere efforts and help of Prof. Neville, Sir Francis Spring and the Governor, Madras, the University of Madras on approval of govt. sanctioned a scholarship of £250 per annum for two years, tenable in England from 1 April 1914 with free passage and expenses on outfit. This scholarship was subsequently extended for 5 years. At the request of Ramanujan, a sum of Rs 60 from his stipend was granted and given to his parents at

Kumbakonam. Ramanujan sailed for England on 1st March 1914, reached London on 7th April 1914 and got admitted into the Trinity College which granted him a lump sum scholarship of £60.

Ramanujan reached his appropriate destination, the new holy world of mathematics that waited for him which conjoined Prof. Hardy with him, developing a mutual relationship, which has immortalized both of them. Mr. Hardy could guide him rapidly who expressed that he learnt from him more than Ramanujan learnt from him. There were some difficulties for food as he was a strict vegetarian.

Mr. Arthur Berry, tutor of mathematics at Kings College, Cambridge expressed to Prasanta Chandra Mahalanobis (renowned wizard of statistics of India), his student about Ramanujan's prodigious intelligence. He made large number of conjectures, most of the results apparently came to his mind without any effort, by his pure intuition. At the request of Madras University Mr. Hardy sent them a report on Ramanujan's work that 12 papers from 1914 to 1916 had been published in various British journals and one of them "Highly Composite Numbers" is the most interesting one and that his memoir was one of the most remarkable published in England for many years. In March 1916, Ramanujan was awarded the B.A degree. His life in Cambridge was marked by ceaseless labour and dedication to mathematics. During his 5 years stay in England, his 21 papers were published in various European journals out of which 5 papers were written in collaboration with Prof. Hardy.

Prof Hardy proposed the name of Ramanujan, though very young, was elected for the Fellowship of the "Royal Society" which is Britain's most prestigious Scientific Institution, regarded as the highest National Honour by British or Commonwealth Scientist or Mathematician, on 28 February 1918. This eulogistic news was communicated telegraphically by Prof.

Hardy to Ramanujan who was ailing at a clinic who reciprocated his thanks. Thus, he was the first Indian FRS after 77 years.

Mr. Hardy had visited the ailing Ramanujan to know his health condition. He, with anxiety expressed that the number of the taxi by which he came was 1729 which was perhaps not an unfavourable omen. Ramanujan denied saying it was an interesting number of sums of two cubes in different ways i.e. $1729 = 17^3 + 1^3 = 10^3 + 9^3$. Hardy was amazed.

Ramanujan's own Trinity College also honoured him electing with a Fellow on 13th October, offering him an annual stipend of £250 for six years without any duties and condition attached to it, which was communicated by Mr. Hardy to the Madras University. In response, Madras University also granted yearly allowance Rs 250 for 5 years from 1st April 1919 for his return journey and subsequent trips to Europe. He expressed his gratitude to the Registrar, Madras University and wished the entire surplus money after meeting his family requirement, should be used for educational purpose of the poor and orphan children. This shows Ramanujan's humility, his solicitude for his parents, wife and sympathetic concern for the poor and helpless.

His health declined as he succumbed to Pulmonary Tuberculosis. Though improvement was noticed, it was felt that he should join his family for proper care. He left England on 27 February 1919 and returned to Madras in January 1920. In spite of best medical treatment offered to him, he passed away to immortality on 26th April 1920 at the age of only 32 years 4 months and 4 days.

During his short life span he contributed more than 3000 theorems, and compiled nearly 3900 results. His discovery "Mock Theta Functions" was his last major contribution to mathematics.

The Birth centenary of Ramanujan was celebrated all over the world on 22nd December 1987 and at the

Anna University, Madras. Prof George E. Andrews of Pennsylvania State University who had discovered, edited and compiled the "Lost Note Book" of the great genius was released on this occasion. Its first copy was presented by Rajiv Gandhi, the then Prime Minister to Smt. Janakiammal, Ramanujan's wife (born in 1899).

The 125th Birth Anniversary of Ramanujan was celebrated on 22nd December 2011 which was to be closed on 22nd December, 2012. The 22nd of

December is observed every year as the National Mathematics Day. India Post paid homage to this genius by issuing two commemorative postage stamps of Rs 5.00 denomination each on 22.12.2011 and another on 22.12.2012.

(The author is a retired DFO from Odisha state and President, Kendujhar Philatelists' Association Bhubaneswar. He can be reached on Mobile No. 9437001212) ♦

Did you know

The cover page photo is by Mr. M. N. Jaya Kumar IFS (Retd) FRPS, MFIAP, Retired additional Principal Chief Conservator of Forest from Karnataka. The following two distinctions were awarded to Mr. M. N. Jaya Kumar, IFS (Retd)

FRPS: The Royal Photographic Society of Great Britain, commonly known as the Royal Photographic Society (RPS), is one of the world's oldest photographic societies. It was founded in London, England, in 1853 as the Photographic Society of London with the objective of promoting the art and science of photography, and in 1853 received royal patronage from Queen Victoria and Prince Albert. FRPS is the highest Photographic Distinction awarded by the Royal Photographic Society

MFIAP: The highest distinction awarded by the Federation Internationale De L'Art photographique (International Federation of Photographic Art), a body affiliated to United Nations Educational, Scientific and Cultural Organization (UNESCO). FIAP is the only International Photographic body affiliated to the United Nations Educational, Scientific and Cultural Organization (UNESCO)

Mr. Jayakumar was the fourth Indian to have been awarded Fellow of the Royal Photographic Society (FRPS) and MFIAP, two of the highest distinctions awarded in the field of Photography for Nature Photography. The earlier winners are M Y Ghorpade, T N A Perumal and B Srinivasa.

The twin distinction of FRPS and MFIAP for Nature Photography to an individual has come after 21 years as Srinivasa got these distinctions in 1989.

Over a period of 30 years, The International Federation of Photographic Art has awarded about 150 MFIAPs of which less than 25 are for Nature Photography.

Mr. Jayakumar was awarded FRPS in 2009 and he is the first Forest Officer from India to have received these distinctions.

"You wouldn't think you could kill an ocean, would you? But we'll do it one day. That's how negligent we are."

CAPTURING OF AN ESCAPED TIGER BY INDUCING MATERNAL EMOTION

**By
Dr K. Thulsi Rao**

I started my career as a trained wild lifer in 1980s in the Indira Gandhi Zoological Park (IGZP) and worked there for more than a decade. It was full of investigative, fascinating and action-packed job. Orientation imparted from prestigious Forestry & Wildlife institutions made me to work beyond the job schedule. This had driven me to live with my family very close to the zoo, in the outskirts of the city so that I can attend the job even beyond my schedule hours of working.

Sprawling over an area of 625 Acres, on the opposite side of the Kambala konda National Park, the Indira Gandhi Zoological Park, is located in three series of mountainous-valley region of Sita Konda R.F of Eastern Ghats landscape, that juts in to the Bay of Bengal.

It was a mid-December morning; I popped up into the zoo at 6'O clock for a morning walk cum inspection. I was overjoyed to see mist all around our neighbourhood. The outskirts of the city were covered with fog. The houses on the other side of the road looked hazy. The cars on the highway had the headlights on and some even had the yellowish fog lights on. There was no strong breeze so it was not very cold outside, but just foggy.

As I reached the main gate of the zoo, I parked my Explorer in the parking space and stood at Y-junction watching and admiring the amazing beauty of nature. I was quite delighted to walk through the foggy morning through the protected woods of the zoo. The tranquil valley was swaddled in a veil of 'poltergeist-white' mist. It was eerily silent in the valley the reason was obvious. It was difficult to see anything twenty

feet away. It looked as if the entire place was covered with a cool screen. The air inside the zoo was then cool and pleasant. Then I moved leisurely towards monkey moats. As I was approaching the road-bend, prior to walk-in-aviary: unbelievable to my eyes, saw a silhouette in dark outline of something in the middle of the road against the dimming sky. Ahead of my way I could see the outline of an animal. I could not clearly see its face or the colour of its coat through the mist as it was sitting upright, backward posture. Twitching tail (tip) slowly from side to side indicating that it was a feline species in a focused mood with alertness. But it was not sure from its size from a distance whether it was a panther or any other species. This area had been known for frequenting panthers for preying the ungulates, in open moated enclosures and free ranging deers outside. As I was alone, I dared not to move ahead, instead turned back to reach the motor bike, then I saw Dharmarju animal attendant at feline enclosures retreating back after attending nature's call. As I was fast walking, learnt from the conversation, animal attendant Dharmarju kept the newly recruited attendant as in-charge in his short while absence. Then it immediately raised a suspicion in mind and got him on my bike as pillion rider, driven fast in opposite direction on the ring road and reached the tiger night cage of feline section. While riding, alerted all other attendants on the way to come over to the spot for assisting us in the operation.

Here at tiger enclosure, seen an animal attendant on training sincerely flushing inside the night cages. Sri Gantla Apparao was on duty. As part of routine duty, cleaning of all the night cages begin at 6 in the morning and complete before the visitors enter the

park at 9'O clock. It is mostly done by the night duty staff every day, before they break for the day and depart to take rest. Neatly dressed animal keepers take charge of the day duty, verify the security, take animal count, make inventory of observations during the night special diets to be given to the juveniles, sick and pregnant animals if any, besides performing watch and ward, till the animals taken into the night cages for feeding around 5'O clock in the evening.

Upon arrival to the night cage, Dharma Raju, the escorting animal keeper startled and frightened to notice that a recently bred tigress was missing from the night cage while the five days old altricial litter of two blind pups slept cuddling with a rhythmic eupnoeic breathing indicating the cubs were well fed by the mother indicating that the escape from the cage was not more than few minutes. Normally the mother will not readily leave her cubs unattended in the den for the first two months of their lives. Cleaning of the cages are normally done while transferring the inmates into vacant cells.

This had been confirmed by Dharma Raju that the tigress was very much there when he left the cage about twenty minutes back. Terrified to know the escape, both the keepers were perplexed and were at complete loss of their senses and absolutely no knowledge as to how to respond immediately to the situation.

While reconstructing, within me, the mishap, simultaneously my conscious mind was fast working as to how I could get back the tigress into the night cage. Now, I understood how the mistake had taken place. The new keeper had failed to understand the simultaneous actions of opening and shutting of sliding doors which needs some experience in handling. This action was in practice to gain free space for the keeper to move in and clean the night cages one after the other. The other advantage was to allow the nursing females into the day-cage to get

exposed for morning sunlight before other animals are set free into it. After an hour the milking mother would be brought back for feeding the young litter, by luring with chicken meat and milk. Perhaps the tigress must have followed the routine exercise of moving out through an opened door which led her out, off the cage instead of get into the day cage. On seeing, the totally new and unfamiliar premises, this must have confused and waiting on the road twitching tail slowly from side to side indicating that it was in a focused mood with alertness perhaps waiting to reach out the day cage for familiar surroundings. I remember to understand this behaviour of the zoo raised animals from the very words of Dr Kailash Shankla and Saroj Raj Choudhury, the tiger men of our country in 1970's, under whom we were groomed both in classroom and in the hectic field exercises during our Wildlife Management Diploma course.

Suddenly it struck to my mind - a meticulous but a risky plan. There was no time to put it for discussion across for the *pro et contra*. Meanwhile other two neighbouring animal keepers arrived at the tiger's night cage and explained them the actions to be followed scrupulously. Upon my instructions, Dharmaraju -the animal Keeper held one of the tiger cubs and sat at the back of me. My plan was to take the cub and twist its tail so that the scream of the cub would steer the mother tiger towards the origin of the sound of the sibling. Driven the explorer along with the bait, to the neighbouring long bushy area on the path to panther enclosure. This was a natural shrubbery of thick miscellaneous growth that stood as a vegetative barrier lying within the audible range and the escape distance to the cage.

Our plan as expected worked out well. The tigress ran after us. Explorer was brought to halt abruptly at the entrance. We both ran into the opening of the night cage. We left the cub in the corridor and escaped into the day cage through already made-opened central passage of animal house. My decision of leaving

the bike outside the cage and running into the night cage was quite visible to the tigress as it had almost reached immediately after us. Otherwise it could have been after me still thinking its cub was with me. As we jumped into the day cage, the keeper sitting safe in the side iron- grilled cubicle, shut the iron sliding-door. As the tigress entered into the corridor, the door from outside was shut by the keeper kept for this purpose. Thus the 'Operation Tiger' had come to a safe end.

Now the real problem started. That is the administrative action. Lot of pressure was mounting on me to complain against the keepers for their alleging irresponsibility. It was the conflict between binding morale of the staff and the administration. Unlike

the forest administration, the zoo administration something akin to the industry related. This requires a team spirit and encouragement rather inflicting punishment on individuals for really not of their intentional mistakes. Happening of such incidents are not uncommon. However constant refresher trainings and mock drills on safety for both human and animals would bring down such incidents.

I acknowledge my sincere thanks to the Forest Department for considering my request for capacity building, all my alma maters and teaching faculty for the kind of trainings imparted. (The author is a retired Dy Conservator of Forests & presently Director, Global Biodiversity Solutions). ♦

Answer of green Quiz

	1. Great Indian Bustard	2. Gangetic River Dolphin	3. First Jain Tirthankara
4. Launch of Project Tiger at Jim Corbett NP	5. Chimpanzees, Bonobos	6. Van Gogh Mutation	7. Maple Leaf
8. Buliu River, China	9. Plunge Waterfalls	10. Karanji Lake, Mysore	11. Peninsular Gneiss
12. Hydrography	13. New Zealand	14. Ultramarine	15. pH

"It is unwise to be too sure of ones own wisdom. It is healthy to be reminded that the strongest might weaken and the wisest might err."

– Mahatma Gandhi

*"Be the reason someone smiles.
Be the reason someone feels loved and believes in the goodness in people."*

ARTHRITIS IN GENERAL

By

Dr N.V. Jayanth Babu

ARTHRITIS is described as chronic and acute inflammatory disease of joints accompanied by structural damage and pain. Arthritis is also known as age related bone degenerated ailment, caused due to wear and tear, wherein, the protective tissues in the joints get damaged, by which, the quality of life is affected. If neglected, the pain is accompanied by, stiffness, swelling, decrease in mobility. Rheumatism is a nonspecific and informal term used in the past, to describe joint diseases or syndromes. The term Arthritis is like an umbrella, covering more than 100 types of different arthritis and related diseases, out of which, the following are very common.

Osteoarthritis (O A), 2) Rheumatoid Arthritis (R A), 3) Osteoporosis (O P), 4) Gouty Arthritis, 5) Psoriatic Arthritis, 6) Fluorosis Arthritis - Skeletal Fluorosis

In Urban areas and cosmopolitan cities, as per the Latest census, about 53 percent of male population, 38 percent of female population, and 9 percent children are suffering from Arthritis. In advanced countries like America, more than 50 million adults and about 3 lakh children are suffering from some type of Arthritis. In India it was estimated that, over 180 Million people are suffering from Arthritis. In Europe over 120 million people are being affected and on an average spending 200 billion dollars of money every year. In view of the larger interest and severity of sufferings of the highest number of Billions of Arthritis patients from all the countries in the world, for creating awareness 12th OCTOBER IS DECLARED AS WORLD'S ARTHRITIS DAY. In our country, NATIONAL ARTHRITIS WEEK (NAW) is declared and marked from 19 —25th. JUNE. On these days, *it was proposed to create awareness among the people, on Arthritis in detail* and on several aspects including therapeutical practices to

be adopted, through wide publicity.

Arthritis, if not diagnosed in its early stages, treatment is neglected and if the damage caused to joints is more than 50 percent i.e., in its acute stage, **CAN NOT BE CURED COMPLETELY.** For further sustenance, surgeries are to be resorted to and harmful pain killers, medicines are to be used for a longer period.

SOME INTERSTING FACTS ABOUT HUMAN BODY RELATED TO ARTHRITIS

- Human body contains 206 bones and occupies around 12 to 15% of the body weight. Axial skeleton comprises 80 bones (skull, neck, spine) and Appendicular skeleton - 126 bones (Arms, Pelvic girdle, Legs).
- Bones are rigid tissues that constitute vertebrate endoskeleton, which provides structure, support, protection and movements to limbs. Bones produce stem cells from bone marrow. These stem cells can develop into platelets, Red blood cells, White blood cells,
- Every day, on an average, from the healthy bone marrow of an adult, about 200 Billion platelets are produced. The platelets thus produced, live in body only for 7 to 10 days. White blood cells survive for few hours to few days and Red blood cells survive for 120 days.
- A Baby's body contains about 270 bones at birth. With advancement of age these bones eventually fuse and grow together to form 206 bones.
- The dynamic nature of bone means that, collagen in bones renews constantly and old

bone is subjected to resorption or diluted for repair or for release of calcium, so that, for a period of every 7 years, you have completely a new skeleton. The cells responsible for bone resorption or break down are the osteoclast cells.

- Bones continue to grow in length up to an age of 25 yrs only.
- Even though Bones have 90 % Calcium in the body, our daily requirement of calcium is 800 to 1200 mg. In case of Athletes who does strenuous work outs and weight-lifters may need about 3000 to 5000 mg. of calcium per day.
- In the absence of Vitamin D, Magnesium and Zinc our human body cannot absorb and utilise Calcium directly. (From the gastro intestinal track). The calcium thus left unutilised is stored in the Liver and kidneys and subsequently excreted from the body.
- If, sufficient quantity of calcium is not provided to the body from the individual diet, the body inevitably draws the required calcium from the bones and cartilage through the process called bone resorption by utilising multi nucleated osteoclast cells, resulting less density in bones and erosion of cartilage over a period of time.
- If the Ph of the blood in Human body remains acidic for a longer period i.e., below 6.5, the cartilage present in bone joints is eroded gradually. So, our diet plan is to be altered accordingly, to maintain the Ph of our body to be Alkaline i.e., more than 7.
- More than 600 muscles are attached to bones in human body, are useful for performing different movements. The total weight of muscles contributes 40% of the body weight. About 300 muscles of the body are used when we stand upright. Spine alone is supported by

140 muscles. Hence the presence of strong muscles contributes a lot for the health of the joints and to overcome Arthritis.

CAUSATIVE FACTORS RESPONSIBLE FOR ARTHRITIS IN GENERAL:

All Quadrupeds stand and move on their 4 legs / limbs, keeping their spinal cords parallel to the ground, so that the body weight is distributed equally on 4 legs and hence no Arthritis for Animals. In case of man, in the ancient days, was a quadruped and in the process of evolution, became homo-erectus, the ancestor of modern man, standing and moving on his 2 legs, keeping his spine perpendicular to the ground. As a result, the load bearing big joints like, the knees, spinal cord and hip joints are affected in most of the people, as age advances. For this reason, in human beings, after they cross the age of 40 years, knee pain and back pain are very much common.

The Factors responsible for Arthritis are 1) Obesity 2) Negligence 3) Addiction to Alcohol 4) Smoking 5) Lack of proper physical exercise 6) Indiscriminate usage of Joints 7) Presence of abnormal levels of uric acid in blood for a longer period 8) Less intake of Calcium, Vitamins, Phosphorus, Magnesium, Zinc, Potassium 9) presence of toxins and free radicals in more quantities in body for a longer period 10) Chronic Constipation 11) Usage of drugs like steroids and other drugs NSAIDS, DMRDS, Immune suppressants for treatment of other diseases 12) Un wanted and un healthy food habits and life style 13) Genetical factors 14) Injuries sustained to bone joints 15) Hormones imbalance 16) Stress and mental worry 17) Living Environment 18) Over strain 19) Intake of more salt everyday

ABOUT THE BONE JOINTS

- Joints are the places in human body, where two or more bones meet, meant for allowing the movements of limbs. The two largest and most complex joints in Human body are Hip and Knee joints.

- **ARTICULAR CARTILAGE:** is a smooth, white, elastic, highly specialised and extraordinary connective tissue that covers the ends of the bones, when they come together to form joints. This Articular cartilage has key roles in smooth functioning of joints with low friction, provides padding / cushioning in between the bones at joints, to take up and distribute load. When cartilage in the joints is damaged it can cause severe pain, inflammation, and some degree of disability. The thickness of normal human cartilage present at various joints is a) at ankle joints 1 to 1.12 mm, b) Knee joints 1.69 to 2.55 mm, c) at Hip joint is 1.15 mm to 1.46 mm, d) at fingers 0.1 to 0.2 mm. Articular cartilage has no blood vessels and nerves to supply nutrients to Chondrocytes. Instead, nutrients diffuse through a dense connective tissue surrounding the cartilage called perichondrium into core cartilage. Articular cartilage has a limited capacity for self-regeneration or repairs or heals after sustaining an injury. It grows extremely slower, when compared to other tissues and often exhibits its inability to heal. We will continue to have a detailed study on this, under Osteoarthritis.
 - A synovial joint joins bones with a fibrous joint capsule. This is characterised by the presence of a fluid filled joint cavity, contained within a fibrous capsule. The outer layer of the joint capsule is made up of a fibrous tissue, known as the capsular ligament. It holds together the articulating bones and supports the underlying synovium. The inner layer of the synovial joint is highly vascularised layer of serous connective tissue. It absorbs and secretes synovial fluid, and is responsible for mediation of nutrient exchange between blood and joint. This is known as synovium. The main functions of synovial fluid are a) Lubrication, b) Nutrients distribution and c) Shock absorption. Bursa is a small sac lined by synovial membrane and filled with synovial fluid. Bursae are located at the key points of friction in a joint. Ligaments hold the bones together and resist excessive and abnormal movements of synovial joints. *All the Synovial joints in the body, at Ankles, Knees, pelvic / hip joints, shoulders, wrist, elbows, fingers are susceptible for ARTHRITIS.*
 - Human body has 360 joints. (Skull - 86, Neck - 6, Thorax - 66, Spine and pelvis - 76, Hands, arms fingers - 64, Legs, feet and toes - 62. Total = 360 joints).
 - Spine has 33 vertebrae (Cervix-7, Thorax-12, Lumbar-5; Fused vertebrae are - sacrum-5, Fused coccyx / tail bone - 4. Total = 33 vertebrae).
 - Spinal cord ends at Lumbar -1 to Lumbar-2 level only. Spinal cord is not present in Lumbar-3, 4, Sacrum and in coccyx. Below Lumbar i.e., from L3 cauda equina nerve roots occupy the sac.
 - Shock absorbing, elastic, spinal Cartilage discs numbering 23, are present in between movable vertebrae of the spine contribute 25% of its total length. With the advancement of age, people appear to be shorter, due to wearing, shrinking and compression of cartilage present in between inter vertebral cartilage discs.
 - When we land on the ground after jumping, our knees have to withstand the impact, which could be 12 times more to our own body weight.
- (Suppose a man with a body weight of 80 kgs., performed a long jump, if a single knee is landed on the ground first, it would receive a thrust of about $80 \times 12 = 960$ kgs and 480 kgs, if landed on both legs) (The author is a retired DFO and can be reached on E-mail I.D. nagireddy.jayanthbabu@gmail.com). ♦

COMPILATION OF JUDGEMENTS IN FAVOR OF DEPARTMENT IN PROTECTION OF FORESTS

By

P. Sri lakshmi, N. Vanitha, Samiullah Khan

Due to the Telangana Governments initiative to purify land records, the Reconciliation of Forest areas and resurvey have been taken up on large scale along with consolidation of the boundaries of the Forests. In this exercise many illegal encroachments of the Forest areas are noticed and action taken by the concerned Field officers for retrieving these areas. In this regard, many cases have filed against Forest department in the High court seeking relief from eviction. To defend a case filed against Forest department in encroachment issue, procedures

prescribed in the Forest law have to be scrupulously followed by the Officers concerned to make the case in favor of the Forest Department.

Field officers while drafting the counters the following extracts from the Hon'ble High court of Telangana judgements are very helpful in presenting the case in favor of the department.

Cases disposed in favour of Department relevant to be quoted in counters to be filed in relevant courts.

Sl. No	Case & Party Names	Relevant part of judgement
1	WP No. 14775/2019 filed by Salavath Billu & 3 others Vs FDO, Nizamabad disposed on 18-7-2019	"As fairly submitted that the person in whose favor right is recognized under the Act of 2006 and certificates issued are not disturbed. However, under the guise of claiming that the petitioners belong to Scheduled tribes and are living in the reserved forest area, they cannot encroach into the forest land and true to cultivate the forest land. Therefore, I do not see any merit in the WP and the relief sought in the WP cannot be granted."
	WA. No. 662/2019 in WP 14775/2019 filed by Salavath Billu & 3 others Vs FDO, Nizamabad disposed on 9-8-2019	"They have repeatedly encroached upon the forest land. Therefore, the Forest Department is justified in dispossessing them from the land, and preventing them from encroaching the reserved forest. Thus, according to the learned counsel, the learned Single Judge was justified in dismissing the WP filed by the appellants. The Forest Department had established the fact that the appellants are not in occupation of land. Under these circumstances, the learned Single Judge was certainly justified in dismissing the writ petition filed by the appellants."



2	CC. No. 1808 /2017 filed by Sunnam Nageswara Rao & 38 others Vs. DFO, Khammam disposed on 23-3-2018	“The District Forest Protection Committee, in its meeting held on 28-6-2017 headed by the District Collector, Bhadradi Kothagudem district, it was concluded that 112 acres of forest and is under encroachment in Malakalapalli village of Annapureddypally Reserved Forest Compartment 43, Chaparalpally East Beat of Chaparalapally section, and there was a scuffle between two groups in their attempt to encroach the land. The land is under the control of the Forest Department and the petitioners are making attempt the encroach upon the forest land without having any right. They have planted different forest species in compartment No. 43 of Chaparalapally Reserve Forest. Since the petitioners were not in possession of the forest land, the question of interfering and destroying their crop, does not arise. In view of the same the petitioners cannot be held to be entitled for a protection. If they are otherwise entitled for a patta under the provisions of the said enactment, it is for the petitioners to take appropriate proceedings in accordance with law. In view of the above, the WP as well as the contempt case are dismissed.”
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“You must not lose faith in humanity.

*Humanity is like an ocean; if a few drops of the ocean are
dirty, the ocean does not become dirty.”*

- Mahatma Gandhi

“You must not lose faith in humanity.

*Humanity is like an ocean; if a few drops of the ocean are
dirty, the ocean does not become dirty.”*

3	WP No. 30/2019 filed by Kunja Nagaiah and batch Vs. RDO, Kothagudem disposed on 13.12.2019	“The provision contained in Telangana Forest Act, 1967, the Telangana Land Revenue Act, 1317 Fasli and conservation of forest act 1980, once area is notified as forest area, the designated officials of the forest department are the custodians of the forest land, and they shall be maintaining entire record of forest land. The competent authority of forest department would have assisted the court in rendering decision objectively, when the status of the land is not disputed, the forest department represented by the competent authority of the state is necessary and proper party on an issue concerning reserve forest and, in their absence, there cannot be proper adjudication. Their presence is all the more required having regard to the history of litigation and consistent stand of forest department on status of subject land. In WP No. 22498 of 2010 the forest department contested the claim of so-called assignees and asserted that the land is in possession of forest department. (para 48) The Reserve Forest land vests in Forest Department and designated authority of Forest department is the custodian. The Reserve Forest Land cannot be used/ diverted for any purpose other than development of Forest growth. Revenue authorities have no competence to deal with forest land and assign such land. Section 33 of Land Revenue act, 1317 Fasli does not give free license to revenue authorities and is subject to Act 1927, Act, 1967 and Act 1980 and subject to overarching public interest and public trust doctrine. From long time possession vested in the Forest Department. Thus, merely on the ground that after long lapse of time power is exercised to cancel the assignment cannot ensure to the benefit of the petitioners as granting relief to petitioners would result in restoring another illegal decision. More so, when possession is not proved on contest with Forest Department. Permitting Petitioners to cultivate land in reserved forest is against Public Interest. (para 61)
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Among the notable things about fire is that it also requires oxygen to burn - exactly like its enemy, life. Thereby are life and flames so often compared.

4	WP No. 17139/2019 filed by Sariyam Veeraswamy & 4 others Vs. DFO, Khammam Disposed on 14-8 2019	“.... , it is clarified that the land in Sy No. 342 is a Private Land and the land in Sy No.343 to an extent of 3534.34 acres is a reserved forest area and taking advantage of the fact that the land in Sy No.343 is an adjacent land to Sy No. 342, the petitioners have encroached into the Forest land and trying to raise commercial crops. In spite of warning given by the forest officials, the petitioners are proceeding with their cultivation activity illegally in the said land..... It is made clear that if the petitioners make any attempt to raise crops in the forest land in Sy No.343, respondents 3 to 5 are entitled to take action against the petitioners in accordance with law. Subject to the above observations, the writ petition is disposed of...”(Page 2)
5	WP. No. 2897/2019 filed by Vattela Mailesham & another Vs. DFO, Rajanna Sircilla disposed on 18.02.2019	“..... to conduct a joint survey in the presence of the petitioner, with in a period of four weeks from the date of receipt of a copy of this order, and determine whether the land falls under the Reserve Forest area. If the land falls under the Reserve Forest area, the petitioner shall work out his remedies under law or seek alternative land for quarrying operations. However, considering the assertion of the Forest officials that the land in question falls under Reserve Forest areas, till such time a joint survey is conducted and the nature of land decided, the petitioner shall not carry out any quarrying operations in the subject land”...writ petition disposed
6.	WP No. 21354/2019 filed on Malluri Ramana Vs. DFO, Kothagudem disposed on 26.09.2019	This WP is filed declaring the action of the 3rd respondent-Forest Divisional Officer in directing the petitioner, vide order dated 18.4.2019, to furnish bank guarantee of the value of the vehicle bearing Registration No.TS28D 1286 at Rs.4,75,000/-, as assed by 5th respondent – District Transport officer as illegal and arbitrary..... It is to be noted that the Writ petition is not maintainable, for, the 3rd respondent in pursuant to the direction issued by the court in WP. No. 46414/2018, issued the impugned order directing the petitioner to furnish the bank guarantee of Rs.4,75,000/- towards value of the vehicle as assessed by the 5th respondent. If the petitioner is aggrieved of the said order, he can move a petition seeking review of the order dated 24.01.2019 in the aforesaid Writ petition, but not by approaching this court again by way of another Writ petition..... Writ Petition is closed.



7	WP No. 6620/2020 filed by Thanam Peddulu & 80 others Vs. DFO. Kothagudem disposed on 09-07-2020	WP filed by the petitioners, who claim to be tribal, are all residents of Thottimppadu Village and that they are cultivating small extents of land in survey No.41 of Annadaivam Revenue Village, Annapureddi mandal which is covered by Forest area. They claim that they are entitled to the benefits under Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. “.....it may be noted that in terms of section 6 read with the Rules made after the formation of the Forest Rights Committee, after the Forest Rights Committee making a recommendation to the Gramsabha and Gramsabha passing a resolution, the resolution is required to be placed before the Sub-Divisional Level Committee. It may further be noted that the Said Committee is the one which is required to be constituted by the State Government, in terms of Rule 5, consisting of Sub – Divisional officer or equivalent officer as Chair-person, Forest Officer in charge of a sub Division with three other members of the Block, etcetera including an officer of the Tribal Welfare Department. The details of the Sub –Divisional Level Committee is mentioned herewith only to reject the contention of the counsel for the petitioners that Project Officer, ITDA is the Competent Authority as Sub-Divisional Level Committee is a body and not an individual officer. The ITDA officer would be coordinating officer who has been assigned with a specific job of ensuring protection of the tribal.....” As there is denial and dispute with respect to the possession of the petitioners over the subject land and there being no concrete material before this Court, except the letter of the Project Officer, ITDA, forwarding the list for verification of the Forest Officer, who, in turn, had communicated that the petitioners are not in possession of the land, prayer of the petitioners that pending disposal of their claims, they shall not be prevented from cultivating the land, cannot be granted. The Project Officer, ITDA to take necessary steps by coordinating with the other authorities and ensure consideration of the claims of the petitioners strictly in accordance with the procedure prescribed under the Act and the Rules. It is made clear that the direction to the Project Officer, ITDA to coordinate is only to give a quietus to the controversy, but not conferring any independent right on the Authority de hors the Rules. As this issue is a burning issue which appear to be pending for few years, necessary steps be taken within four months by the respective authorities. No costs.
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8	WA. No. 253 of 2020 filed by Midium Pullaiah & 4 others Vs FDO Paloncha disposed on 28-08-2020	The case where the pattas posed by the petitioners are genuine but in the guise of pattas encroached the Forest land and resisting planting by the Forest department. "..... Considering the counter filed by the Forest Department, the learned counsel for the petitioners is not justified in claiming that Forest Department has admitted their possession of the land. For, the Forest Department has only admitted their possession to a limited extent of land. However, the present possession, being claimed by the petitioners, has not been substantiated by the petitioners by any cogent or convincing evidence to establish the fact that their possession is a legal one. Since the petitioners have failed to establish a prima facie case in their favor, Since the petitioners have failed to establish the balance of convenience in their favor, the learned Single Judge was certainly justified in dismissing the interlocutory application filed by the petitioners. Moreover, in case the petitioners were to succeed in establishing their case against the respondents, their possession can always be restored by this Court. Therefore, no irreparable loss would be suffered by the petitioners. For the reasons stated above, this Court does not find any illegality, or perversity in the impugned order. This appeal being devoid of merits is, hereby, dismissed. No order as to costs.
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The information is compiled by P. Srilakshmi, DCF (MIS), N. Vanitha, Sr. DPO and Samiullah Khan, Liaison Officer, of Telangana Forest Department. They can be reached on e-mail ID acflaw1.ts@gmail.com ◆

*"We can know only that we know nothing.
And that is the highest degree of human wisdom."*

– Leo Tolstoy, War and Peace

*"If we have no peace, it is because we have
forgotten that we belong to each other."*

– Mother Teresa

YOGA FOR ALL: BREATHE, STRETCH & PRAY; FIT, WE ALL WILL STAY

By Dr Sudhir K Reddy

Life hasn't been the same, this entire year of 2020. What is encouraging to everyone these days is, for the most part, people are wearing masks, embracing the guidelines of physical distancing and taking precautions from the contagion called SARS Corona virus Type-2 (SARS-CoV-2). In short, Corona virus, and the disease is called Corona virus disease of 2019 or COVID-19. During this pandemic, proper nutrition and sticking to a fitness routine are the key to safeguarding one's health.

Going to a gym however, to use exercise equipment or walk on a treadmill while physical distancing is still a bit scary for some. To stay fit and breathe fresh air, walking or exercising outdoors is still a great idea than wearing a mask and doing anything indoors, even window shopping or walking indoors at the local mall. Needless to say, it is still a bit uncomfortable to breathe with a mask on. So how do we keep fit as we get used to "the new normal"? While the weather hasn't completely cooled down, enjoying the natural outdoors and the Fall colours is indeed more attractive to many. Along with jogging, walking, weight-lifting and aerobic exercises, some of us practice yoga for Fitness.

Yoga is a great fitness activity one can cultivate and practice outdoors without the need of any equipment or a gym. It's a great way to exercise, breathing the fresh air and connecting with Nature. As social beings, we crave for socializing, stepping-out of homes and yoga is a great outdoor activity for both fitness and fellowship. There are different forms of yoga for all different fitness needs. In most, if not all, we treat our minds & body as temples of energy and positivity, to mindfully achieve our physical or emotional fitness goals. In all yogic exercises, we use our bodies as weights and as fitness equipment to (1) breathe, (2) stretch, &/or (3) exercise. Any one of the above three or all of the above are the minimum requirements for a novice to start yoga.

Contrary to popular belief, anyone can do yoga, with or without any prior experience: (1) To eliminate all

popular misconceptions, if you can "breathe" and comprehend instructions, you are fit enough to do some form of yoga, to improve your self-awareness, concentration and meditate to improve your mental & physical health. Even for those who are aged or unable to walk, sitting in a comfortable chair, one can practice yoga just by breathing & moving the limbs, to the best of their ability. Even very seniors at a nursing home environment, can and do practice yoga.

(2) Young and old, with families, as couples or alone, one can "stretch" together or separately, to improve their physical health & overall fitness of the skeletal system including muscles, ligaments and tendons, as well as bones and joints.

(3) Every pose (*asana*) in yoga is an "exercise" to introspect one's weaknesses and strengths. We learn to exert and understand our limits in a routine of specific *asanas*, to suit our needs. Also, we bring into "union" (the meaning of the word "yoga") our minds and bodies. We find peace and harmony with our abilities and work at self-improvement, in this "journey of the self", which is the true essence of all yogic exercises.

No yoga-studio can offer the company of such amazing audience. Majestic trees: Oaks, Poplars and Maples, painting the landscape with colours of the season; Beautiful birds: Cardinals, Orioles, Nuthatches and Woodpeckers often cheer-on at the fitness-conscious souls, connecting with Mother Nature, on the inside and outside of oneself.

The author, Dr Sudhir K. Reddy, DVM, PhD, an Immunovirologist/scientist and a veterinarian, is a Pfizer-retiree & an independent consultant at Reddy Bioscience Solutions, Mattawan, Mi. He teaches yoga in Greater Kalamazoo Area and freelances/writes/consults on topics of public interest involving animal/human health & wellness, as well as Nature/Wildlife. He could be contacted at sudhirkreddy84@gmail.com. ♦

BOOK REVIEW

Title: Oka Vanapremi Jeevana Yanam (Sveeya Charitra) **Author:** Keesara Buchiram Reddy B. Sc, LLB, IFS(R) **Language:** Telugu **Pages:** 114 + viii **Year:** 2020 **Printers:** Satish Graphics, Chikkadpalli, Hyderabad - 500020 **Publisher:** Author [With an introduction by Sri JV Sharma, IFS(R)] **Reviewed By:** Dr B. Raghotham Rao Desai, IFS(R).

For a Forest Officer by profession and one who used to read voraciously but seldom attempted to write until he became Editor of 'Vana Premi' (the mouthpiece of APRFO Association on its launch in 1997) quite a few years after his retirement on superannuation, Buchiram Reddy has done remarkably well as a writer both in English as also Telugu in which he commands proficiency. Author of a few books, the writer is known for regular feature articles, book reviews, legal notes, obituaries (whenever any member of the association breathed his last), translations in the forms of prose as also verse from Telugu and occasionally Urdu, and the like. It is true that the path to achieve success by maintaining high ideals and professional ethics is paved with many slipping biles and hence one has to be cautious in one's gait. One may sometimes see the self, surrounded by unctuous flatterers and at other times by those who want some special favours. This may sharpen one's thirst for fame, hunger for position, power, high profile or honour. However, an ideal professional in any service is one who remains above all these temptations. Buchiram Reddy tried to be one. The book has a loose structure but that form appears perfect for the author because his mind is allowed to go where it wants to and which way it goes, you would like to follow. Graphic in detail, stark in expression, the author has found a style completely of his own. It is no book for a hasty reader but if one is willing to meander through the byways and stop & explore the thoughts and feelings, it could be a rewarding experience. Chronicling the

kaleidoscope happenings in his life and service one at a time, the author is both a mascot and the mapper! He tells us why it is important for objective, fearless and constructive voices to take charge to shape the Department on certain issues and affect the forests and the country's environment at large. Respect for nature spills over into cloying reverence - the autobiography with its insights into the protagonist's way of taking decisions & approaches as also exhibiting administrative skills, is an enjoyable book. However, the very act of reading being a very subjective one, what reads well for one person may not be the same for another. There is also an assumption that a good book is more intelligent than its author and it is capable of saying things that the writer is not aware of! It is a satisfying and worthwhile effort to write his memoirs. The author mentions about all those in the family, his ancestors, neighbourhood, and colleagues & his acquaintances with flourish and great attention to detail meticulously in the book which is attractively bound for all his associates to savour - particularly those near & dear ones residing in his native place and the places around for whose readership & convenience he appears to have chosen to write in his mother tongue, Telugu. Let's be optimistic that the younger generation of the region to which the author belongs will be inspired to do better in whatever field they have chosen as builders of the nation after getting the Title: Oka Vanapremi Jeevana Yatra (Sveeya Charitra) **Author:** Keesara Buchiram Reddy B.Sc, LLB, IFS(R) **Language:** Telugu **Pages:** 114 + viii **Year:** 2020 **Printers:** Satish Graphics, Chikkadpalli, Hyderabad - 500020 **Publisher:** Author [With an introduction by Sri JV Sharma, IFS(R)] **Reviewed By:** Dr. B. Raghotham Rao Desai, IFS(R) message the author is trying to spread through this book which conveys the idea that no one is too small to make the difference. As I know him, the author not of the type

who considers temporary despairs or passing phases of disappointments and difficulties to conclude that life is not that meaningful. He belongs to the elite who are invaluable part of the forest services & have a purpose to fulfil for the conservation of biodiversity & enrich the environment as he believes that he is not here by fluke, but for a good design. After all we humans, having been endowed with unique strengths are here to make the most with what we have even if any support from outside is not found at times. Majority of us often show disrespects to the gifts of life that are bestowed upon, belittling great opportunities that come our way and which were there for us to grab! It would have added glamour to the book if it was divided into six or seven chapters (such as Ancestry and childhood, In the quest of higher and professional education & training, Middle years, Years in senior position, Of Special Consideration et al.) and then arranged the 58 items of the book under them to make it more attractive. Further it would have been a lot worthwhile had the required attention been paid to affect a thorough

proofreading, when quite a few errors would have possibly got erased. Mighty hurry appears to have needlessly intruded at that stage instead, to give a go-ahead to the printers who gleefully had a free run. However, it has to be acknowledged that the selected photos are well interspersed though a few of them have gone without captions. Still, the book will be surely welcomed as it makes a wonderful page-turner. It is pleasant to note that the author ends his autobiography by paying homage to Mother Nature and quotes the following shanti-mantra from Vedas / Upanishads:

*Sarvey bhavantu sukhinaha |
Sarvey santu niraamayaah |
Sarvey bhadrani pasyantu |
Makaschit dukkhabhaagbhavet |
Om shanthi, shanthi, shanthihi ||*

Meaning: May all sentient beings be at peace, May no one suffer from illness, May all see what is auspicious, May no one suffer. Om, Peace, Peace, Peace. ♦

Continuation from page No. 60

to be extremely high value ecosystem. The learned Additional Sessions Judge has considered only some factors but ignored relevant material. This has led to perverse prima facie findings.

The high court felt that the discretion exercised by the learned Additional Sessions Judge in granting bail to the accused/respondent is not only in ignorance of the relevant material on record but also against the well settled principles of law. Most important parameters governing exercise of discretion in bail matters have either been not considered or considered in ignorance of relevant material.

In the circumstances this application is allowed. The bail granted to the respondent is cancelled. On the request of the learned counsel for the respondent the order is stayed for two months to enable the respondent to approach the Supreme Court.

The judgment is pronounced on 12 December 2014.

Source: Internet

K.B.R

*Playing with fire is bad for those who burn themselves.
For the rest of us, it is a very great pleasure.*

NEWS AND NOTES

Air Pollution Linked to 15% Coronavirus Deaths

Globally: Study: Long-term exposure to air pollution may be linked to 15 percent of Covid-19 deaths globally, according to research published Tuesday that highlights the health risks posed by greenhouse gas emissions.

Previous research has showed how air pollution from exhaust fumes and factories takes two years off the life expectancy of every man, woman and child on Earth.

Now experts in Germany and Cyprus say they have estimated the proportion of deaths from coronavirus that can be blamed of the exacerbating effects of air pollution.

Their study, published in the journal Cardiovascular Research, drew on health and disease data from the US and China relating to air pollution, Covid-19 and SARS -- a serious lung disease similar to Covid.

They combined this with satellite data of global exposure to particulate matter -- microscopic particles -- as well as ground-based pollution monitoring networks, to calculate to what extent air pollution can be blamed for Covid-19 deaths.

In East Asia, which has some of the highest levels of harmful pollution on the planet, the authors found that 27 percent of Covid-19 deaths could be attributed to the health effects of poor air quality.

In Europe the proportion was 19 percent, compared with 17 percent in North America. "If both long-term exposure to air pollution and infection with the Covid-19 virus come together then we have an adverse effect on health, particularly with respect to the heart and blood vessels," said paper co-author Thomas Munzel.

He said that air pollution made known Covid-19 risk factors such as lung and heart problems more likely.

Specifically, the team noted that particulate matter appeared to increase the activity of a receptor on lung cell surfaces, ACE-2, which is known to be involved in the way Covid-19 infects patients. "So we have a double hit: air pollution damages the lungs and increases the activity of ACE-2, which in turn leads to enhanced uptake of the virus," said Munzel, a professor at the University Medical Center of the Johannes Gutenberg University, Mainz.

The authors stressed that attributing Covid-19 deaths to air pollution did not mean that pollution itself was killing people with Covid -- though they didn't rule out such a cause-effect linkage.

Jos Lelieveld, of the Max Planck Institute for Chemistry, told AFP that the research suggested "the pollution particles are a co-factor in aggravating the disease".

He said their estimates suggested that more than 6,100 Covid deaths in Britain could be attributed to air pollution. In the US that figure is around 40,000.

The authors said that without a fundamental change in how cities power themselves, including a transition to clean and renewable energy sources, air pollution would continue to kill huge numbers of people even after the pandemic recedes.

The pandemic ends with the vaccination of the population or with herd immunity through extensive infection of the population," they wrote. "However, there are no vaccines against poor air quality and climate change. The remedy is to mitigate emissions."

Climate crisis: Global temperature rise of 2C 'would release billions of tonnes of soil carbon'

Harry Cockburn: - Soils contain between two and three times as much carbon as the atmosphere, but the warmer it gets, the faster it is lost (Getty)

Soil is a huge, but little-recognised, carbon storage facility.

The world's soils contain two to three times more carbon than the atmosphere, but as average global temperatures creep up, the rate of decomposition of organic matter also goes up, meaning the amount of carbon released from soils also rises.

A new study estimates that an average global temperature increase of 2C - an outcome the Paris climate agreement aims to prevent - would lead to around 230 billion tonnes of carbon being released from the world's soil.

This is the equivalent of more than four times the total admissions from China over the last 100 years, and more than double the emissions of the USA over the same timeframe.

When carbon spends less time in the soil, this is known as an increasing rate of "soil carbon turnover".

The new international research study, led by the University of Exeter, reveals the sensitivity of soil carbon turnover to global warming and subsequently halves uncertainty about this in future climate change projections.

"Our study rules out the most extreme projections - but nonetheless suggests substantial soil carbon losses due to climate change at only 2C warming," said co-author Dr Sarah Chadburn, of the University of Exeter.

"This doesn't even include losses of deeper permafrost carbon," she added.

This effect is an example of "positive feedback" - when the impacts of climate change causes knock-on effects that then contribute to further climate change.

The melting of the permafrost is a similar cycle, in which higher temperatures cause greater levels of

thawing, which releases more methane and carbon, which go on to worsen the greenhouse effect and heat the planet further.

The research team said the response of soil carbon to a warming world remains one of the greatest areas of uncertainty in understanding the carbon cycle in climate change projections.

To address this, the researchers used a new combination of observational data and Earth System Models - open-source software which can be used to simulate the climate and carbon cycle and subsequently make climate change predictions.

"We investigated how soil carbon is related to temperature in different locations on Earth to work out its sensitivity to global warming," said lead author Rebecca Varney, of the University of Exeter.

The state-of-the-art models suggest an uncertainty of about 120 billion tonnes of carbon at 2C global mean warming, but the study reduces this uncertainty to about 50 billion tonnes of carbon.

Co-author Professor Peter Cox, of Exeter's Global Systems Institute, said: "We have reduced the uncertainty in this climate change response, which is vital to calculating an accurate global carbon budget and successfully meeting Paris agreement targets."

The central aim of the Paris agreement is to reduce international greenhouse gas emissions sufficiently to keep the global average temperature "well below" 2C of warming since the pre-industrial era.

Even if all countries meet their non-binding targets, some projections estimate global temperatures could still rise by more than 3C, and possibly by over 4C.

Currently the planet is not on track to meet the targets set out in the Paris agreement, and some studies have indicated the IPCC's "worst case scenario", in which temperatures rise by up to 5C by the end of the century, remains the most accurate model. ♦

LEGAL NOTES

State of Maharashtra Vs. Suraj pal

A tiger was killed in the forests of Vidarbha Region of Maharashtra State. The investigation connected the killing and disposal of its skin bones to local poachers and their disposal through the middle men to the accused, the respondent herein, who is a resident of New Delhi and has been in the trade of trophies.

After investigation, charge-sheet was laid before the Magistrate at Amaravati and the accused persons were produced before the court. The respondent applied for bail and the application for bail was rejected. He therefore filed appeal in the Sessions Court and secured bail. Aggrieved by the order releasing the accused / respondent on bail, the ACF (Protection) and Wildlife Warden, Nagpur filed Criminal Application No.99 / 2014 before the High Court of Bombay, Nagpur Branch and the matter was heard by the Hon'ble Justice S.B. Shukre.

The allegation against the respondent is that he is a trader who deals with the in purchase and selling of endangered wild animals including critically endangered wild animal, the tiger; and also, is a provider of funds and logistical support required by poachers for killing precious wild animals and extracting their skins and body parts for the purpose of trading in India and abroad. It is also alleged that the respondent has links with international wild animal dealers and thus the offences registered against the other accused persons have transnational ramifications.

The Special Public Prosecutor who appeared on behalf of the State of Maharashtra through Forest Department submitted that there is overwhelming evidence indicating prima-facie involvement of the respondent in the offences registered against him. The investigation reveals that the respondent advanced an amount of Rs. 20,00,000 to Sarju and Naresh. These two persons are also residents of Delhi but they acted as middlemen to get tiger's skins, nails and bones from the poachers in Maharashtra and they in turn pass on the property to the respondent before the court. It is a chance detection when Naresh and Sarju were arrested by Delhi Police on 07.09.2013 when they were traveling in a car bearing registration no. MR-11-E-1001. Their confessional statements of the three accused viz. respondent, Naresh and Sarju recorded by the forest officer reveals their involvement in the crime.

The learned Public Prosecutor further submitted that perusal of the material on record one can see that the crime prima facie committed by the respondent is very serious and threatens very survival of the society as without tigers, forests cannot survive and without forests human society cannot survive. He therefore submits that the Sessions Judge while granting bail to the respondent ought to have considered the seriousness of the crime appropriately, but unfortunately, that is not the case. He submits further that the learned Sessions Judge has ignored other vital aspects of the issue and they relate to possibility of the respondent fleeing from justice and his tampering with evidence and thus interfering with the course of justice. The material shows that the other accused are threatened which is revealed by the statement of the co-accused Sarju dated 26 May 2013.

The learned counsel for the respondent has vehemently opposed the application. He submitted,

although learned Sessions Judge has found presence of material prima facie indicating involvement of the respondent in the crime against him, learned Sessions Judge has properly considered the necessity of keeping the applicant in jail particularly in a crime where maximum punishment provided is for seven years of imprisonment. It is submitted that paramount considerations for grant of bail are seriousness of the crime, punishment provided for the alleged crime and necessity of keeping the accused behind the bars in the sense of whether there is any possibility of the respondent not making himself available for trial if released on bail and whether there is likelihood of the respondent tampering with prosecution evidence keeping the respondent behind the bar amounts to pretrial punishment even when there is presumption of innocence of the accused until he is found guilty.

The court took into considerations an earlier judgment which says, "The provisions of CrPC confer discretionary jurisdiction on criminal courts to grant bail to the accused pending trial or appeal against convictions, since the jurisdiction is discretionary, it has to be executed with great care and caution by balancing the valuable right of liberty of an individual and the interest of the society in general."

The High Court adverted to several judgments of the supreme courts and observed that perusal of the confessional statements of the respondent/accused and his co-accused reveal that there is sufficient material to prima facie find that the allegations made against the respondents apparently constitute an offence punishable under Section 51 read with other relevant sections such as 44, 49-B and 52 of the Wildlife Protection Act. Confessional statements in particular of the co-accused and the respondent himself are sufficient to indicate that, prima facie the offence alleged against the respondent is made out.

It is well settled law that the confessional statements made by the accused in forest and wildlife offences are not hit by Section 25 of the Evidence Act as forest officer is not a police officer within the meaning of Section 25. In this connection a reference is made to the case: *Emerico D'Souza Vs State and Sardar Khan Vs Range Forest Officer, Yavatmal*. The court found no substance with reasons in the argument of the learned counsel for the respondent.

It was found that the learned Additional Sessions Judge in his order dated 30 July 2014 has not specifically observed anything about the existence of any reasonable grounds for believing that the accusations are against the respondent are genuine. The learned Additional Sessions Judge has taken into account many points and guiding principles laid down by the Apex court. He considered the relevant facts during hearing the present petition.

There is now available sufficient knowledge of which judicial notice can be taken and it shows that tiger is of paramount importance for maintaining the pristine health of an ecosystem. Tiger is considered to be symbol of wilderness and well-being ecosystem. Tiger constitutes the top carnivore in an ecosystem and is at the apex of the food chain, it is pyramidal structure and microbes. Tiger is not a just carnivore but also a large predator and it keeps larger herbivore like deer, blue bull, bison etc. within limits. The court brought to light many benefits of wildlife. Briefly stated a healthy forest ecosystem determines sustainability of life on earth itself and since tigers are so important a benchmark of a healthy forest ecosystem, the habitats where wildlife tigers abound are considered

Contd.. on page No.56

THE LEOPARD

The leopard (*Panthera pardus*) is one of the five extant species in the genus *Panthera*, a member of the Felidae. It occurs in a wide range in sub-Saharan Africa, in small parts of Western and Central Asia, on the Indian subcontinent to Southeast and East Asia. It is listed as Vulnerable on the IUCN Red List because leopard populations are threatened by habitat loss and fragmentation, and are declining in large parts of the global range. In Hong Kong, Singapore, Kuwait, Syria, Libya, Tunisia and most likely in Morocco, leopard populations have already been extirpated. Contemporary records suggest that the leopard occurs in only 25% of its historical global range.

Leopards are hunted illegally, and their body parts are smuggled in the wildlife trade for medicinal practices and decoration.

Compared to other wild cats, the leopard has relatively short legs and a long body with a large skull. Its fur is marked with rosettes. It is similar in appearance to the jaguar, but has a smaller, lighter physique, and its rosettes are generally smaller, more densely packed and without central spots. Both leopards and jaguars that are melanistic are known as black panthers. The leopard is distinguished by its well-camouflaged fur, opportunistic hunting behavior, broad diet, strength, and its ability to adapt to a variety of habitats ranging from rainforest to steppe, including arid and montane areas. It can run at speeds of up to 58 kilometers per hour (36 mph). The earliest known leopard fossils excavated in Europe are estimated 600,000 years old, dating to the late Early Pleistocene. Leopard fossils were also found in Japan.



Usually, leopards are larger in areas where they are at the top of the food chain, without competitive restriction from larger predators such as lions and tigers. Some leopards in North Africa allegedly were as large as Barbary lions. In 1913, an Algerian newspaper reported a leopard killed that allegedly measured about 275 cm (9 ft 0 in) in total length. To compare, male lions measure 266–311 cm (8 ft 8 1/2 in–10 ft 2 1/2 in) from head to end of tail.

Subspecies

Following Linnaeus' first description, 27 leopard subspecies were proposed by naturalists between 1794 and 1956. Since 1996, only eight subspecies have been considered valid on the basis of mitochondrial analysis. Later analysis revealed a ninth valid subspecies, the Arabian leopard. ♦



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