IndiaWilds®
Newsletter

Vol 7. Issue VII July 2015 ISSN 2394 - 6946

Eradicating Lantana through existing Government Schemes :

India has got 103 National Parks, 530 Wildlife Sanctuaries and 4.88% of its geographical area is under the Protected Areas (PAs). However, tourists are often disappointed when they go to many of these forests in search of wildlife viewing. There are forests where tourists often complain that they can't even sight a spotted deer. However, the farmers in the outskirts of the forests complain of crop depredations by herds of spotted deers, nilgais and sounders of wild boars etc.

The Ministry of Environment and Forests feel that the wild animals should restrict themselves to the precincts of the official wildlife sanctuary and not cross the boundaries. In fact in a controversial move, the Central Government is ready to allow hunting of these wildlife.

Wild Elephant surrounded by Lantana

Wild animals move from place to place in search of food. Their movements are often dictated by the availability of food, water and mate. They don't understand human drawn boundaries & laws. There was a time when their home land was vast. However, with increase in human population, forests have been clear-felled to set up human habitations. Today, with a billion plus population, Indian's are living cheek-by-jowl with wildlife and that leads to man-animal conflict.

To exacerbate matters, the quality of our wildlife habitats have become poor due to loss of species diversity. Everyday thousands of people enter into the

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forests to collect NTFP (Non-timber forest produce) thereby depriving the herbivores of much needed food. And to make matters worse, most of our forests are overrun by exotic weeds out of which lantana takes the major share. Indigenous trees are not able to grow due to spread of invasive species like lantana.

Lantana camara originating from South America was first brought to India by the British in 1807 as a flowering plant. However, it spread rapidly and now an estimated 13 million hectares of land is overgrown by lantana. (Sharma GP, Raghubanshi AS, 2011).

Lantana with its numerous seeds is easily dispersed and grows well in India's climate. This weed outcompetes other native vegetation. As the density of Lantana in forest increases, species richness decreases (Lamb D, 1991 and Fensham *et al*., 1994). Further studies in the dry deciduous forests suggests that lantana is changing forest structure and resulting in a feedback system that accelerates lantana spread by promoting its competitive superiority over native species. This is leading to species diversity loss and the creation of a homogeneous, mono-specific lantana invaded under-storey in the forest. (Sharma *et al*., 2010, Tropical Ecology, "How Lantana invades dry deciduous forest: a case study from Vindhyan highlands, India")

Lantana grows into tall and thick bushes, that are virtually impenetrable for us as well as for a lot of wildlife. Ofcourse, over a period of time game trails get created.

Lantana is allelopathic and produces biochemicals which inhibits the growth of other species nearby. A study titled "Allelopathic effects of *Lantana camara* on germination and growth behaviour of some agricultural crops in Bangladesh" found that the inhibitory effect of lantana is more pronounced in root and lateral root development than on shoot and germination (Romel Ahmed *et al*., 2012, Journal of Forestry Research) of species like mustard, garden cucumber, black gram, radish, asparagus bean and bengal gram.

Lantana also reduces germination. Due to its strong allelopathic properties, Lantana has the potential to interrupt regeneration process of other species by decreasing germination, reducing early growth rates and selectively increasing mortality of other plant species (Sharma *et al*. 2005ab). Lantana also inhibits the growth of crops like wheat, corn and soybean (Achhireddy *et al*. 1984).

Desertification:

India is also increasingly starring at desertification. 228 mha ie. 69% of India's total geographical area (about 328 mha) is under dry lands (arid, semi-arid and dry sub-humid). These lands are heavily populated and an estimated 32% of India's total land is affected by degradation out of which 81.45 mha or 24.8 % of India's total geographical area is undergoing desertification. (Source: PIB MoEF's press release).

It is known that the water runoff in lands covered by lantana is higher and hence there is more soil erosion. In a place with dense lantana camara, the capacity of the soil to absorb heavy rain is lower than that under good grass cover (Birch, E. B. 1961; Cilliers, Catharina J, 1983, Journal of the Entomological Society of Southern Africa). It takes a long time for the top soil to form and the erosion of the top soil reduces the fertility of the soil and is detri-

mental to agriculture. So in the interest of food security, it is very important that lantana needs to be eradicated.

Impact of lantana on grazing lands:

In places outside our official wildlife sanctuaries and protected areas, where traditionally communities have grazed their cattle, lantana infestations have resulted in loss of pasture. (Humphries and Stanton, 1992). Lantana is also toxic to livestock. So traditional communities like Gujjars engaged in rearing livestock would benefit tremendously if the lantana can be removed from the grazing lands. That would help in native vegetation bouncing back and will increase the availability of forage for their cattle, goats and sheep. This will result in less of cattle grazing inside the forests as forage would be available outside and the human-animal conflicts will reduce.

The pasture losses due to Lantana is estimated at **$924 million US dollars** per year (*Pimentel, D., S. McNair, J. Janecka, J. Wightman, C. Simmonds, C. O'Connell, E. Wong, L. Russel, J. Zern, T. Aquino & T. Tsomondo, 2001. Economic and environmental threats of alien plant, animal, and microbe invasions. Agriculture, Ecosystems and Environment 84: 1–20)*) in India. At the current exchange rate of Rs. 64 to a US dollar, the pasture losses amounts to **Rs. 5913.6 crores loss per year**. The same study quantifies the losses to crops as $37.8 billion per year from weeds majority of which is lantana. This amounts to Rs. **2,41,920 crores** of rupees per year (Two lakh forty one thousand nine hundred twenty crores).

Given the massive losses to bio-diversity and economy, India ought to work towards protecting its biodiversity and removing invasive species like lantana should become one of its immediate major priorities. Fighting lantana infestation may not appear as a big idea as opposed to infrastructure development like road building, however, the yearly savings from this would be much bigger than the total project cost of any infrastructural project undertaken till date in this country. So it is imperative that India seriously starts a program to eradicate lantana. The question is how do we do it?

The answer lies in the much maligned employment guarantee yojana christened as MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act, 2005).

Farmer Suicides:

While lantana infestation is continuing and is only seen as a problem to be tackled by our forest officers, its overall impact on the livelihood of people has gone unnoticed. People living in the villages across India are committing suicide due to crop failures, low or no income and utter poverty.

Migration from Rural India:

Marginal farm workers and other people who don't have a source of income today prefer to go to urban ghettos as the life in that filth and squalor seems to be better than suffering from the pangs of hunger and the allied ills of no jobs in rural areas. 75% of urban citizens live in bottom income segments, earning an average of 80 rupees a day. (McKinsey study, "*India's urban Awakening: Building inclusive cities, sustaining economic growth*", April 2010). Still the migration from the rural areas to the urban areas in India is continuing at alarming proportions. This situation is resulting in massive pressure on our Urban India. The big cities are growing bigger. Urban India is creaking at its seams as the cities have become too huge and unwieldy for people to survive. India's cities need $1.2 trillion US dollars investment to meet projected demand. (McKinsey study 2010)

According to the 2011 census data, the urban population has increased by 90.6 million and this increase is more than the rural population increase. This is the first time in 90 years that the urban population has shown higher increase than the rural population. The migration of rural folks to cities is so alarming that about 300 villages in Uttarakhand have become completely deserted.

If this alarming situation of distress migration to urban areas needs to be stopped then the rural populace ought to be provided regular and steady jobs throughout the year.

This is where the MGNREGA comes into picture.

Goals of MGNREGA:

The Mahatma Gandhi National Rural Employment Guarantee Act 2005, aims to enhance the livelihood security of people in rural areas by guaranteeing hundred days of wage-employment in a financial year to adults of rural households who want to volunteer to do unskilled work. Unfortunately, this scheme though successful in some areas hasn't lived upto its potential of completely removing poverty as well as stopping migration from rural India. However, this scheme can be slightly tweaked to achieve a better future for Wild India as well as a strong rural economy.

Present scope of MGNREGA scheme:

The MGNREGA scheme is to work on water conservation and water harvesting, afforestation, irrigation canal and minor irrigation works, renovation of ponds and other water bodies, road building for rural connectivity etc. Most of the times the MGNREGA schemes are used for constructing roads and digging ponds, strengthening canal bunds etc.

Is lantana removal possible under MGNREGA?

There is provision for afforestation under MGNREGA. For afforestation one needs to remove weeds, dig the soil and plant trees. So lantana and other weed removal can be carried out under the ambit of MGNREGA.

Also, there is provision in the MGNREGA act that any other work can be included under the ambit of MGNREGA act after being notified by the Central Government in due consultation with the State Government. So it is possible that fighting invasive weeds like *Lantana camara*, Parthenium, Eupatorium etc throughout the country is possible by the Government.

The critics of MGNREGA say that due to the unskilled labour being used, the quality of the work done is not excellent. Obviously if you want to construct certain structures which need engineering skills and/or the supervision of engineers, it becomes difficult as currently the work is routed through the local gram panchayats. Though MGNREGA promises 100 days of guaranteed work for people, the place of work and nature of work is different, as the people are required to show up at different projects. At times the place of work is also far off. Together with leakages, some people don't get adequate compensation for their efforts.

If the Government can recognise the harmful impact of lantana on farmers and food security, negative impact on grazing, reduction of bio-diversity within the wildlife sanctuaries and protected areas thereby leading to man-animal conflict, then the Government should have no qualms in fighting the menace of lantana. Fighting lantana can be done through the MGNREGA scheme.

When fighting invasives like lantana is taken up, the nature of job remains consistent. And since lantana needs to be uprooted, burnt and seeds of native species needs to be placed in those areas repeatedly for a few seasons continuously, people have a continuity of work for several years.

Skill set requirements for eradicating lantana:

Weeding invasives like lantana (*Lantana camara*) don't need the skill sets demanded by MNCs. Digging, uprooting, burning comes naturally to people living off their land and these are classified as unskilled work.

Calculations for Budget required to eradicated lantana:

It would need about two man weeks to remove lantana from one acre of forest land using the cut-root-stock method. In flat lands, outside the forests heavy earth moving equipment can be used to remove lantana. However, inside the forests it is

better to reduce disturbance and employ manual labour to cut and uproot lantana and immediately sow or replant native species there. So clearing one hectare infested by lantana and immediately sowing and/or replanting native vegetation will take 35 man days.

Clearing 1 acre lantana infested forest area = 14 man days

1 hectare of lantana (2.47 acres) infested forest area will need = 2.47*14 = 34. 58 man days

1 square km = 3458 man days = 3458/30 = 115 man months

1lakh man days can help clear lantana from = 28.91 sq kms

For entire India: 130000 square kilometres lantana infestation will require 149.84 lakh man months to complete.

The total cost would be **11238.5 crores of rupees** (@Rs.250/- per day).

If every state, excluding say Delhi (for ease of calculation), ie 28 states in total employ 1 lakh people each to weed out lantana, then lantana can be completely removed from India in **5.35 months**. That means, a total of 28 lakh people would work every day for 5.35 months to clear lantana in the first round and sow native seeds and plant native saplings.

The MoEF has to recognise that weeding out invasives from our forests and other fragile ecosystems have to be taken up in a war footing. However, before we start it is important to carry out ground level surveys throughout India to estimate the extent of lantana infestations. The above mentioned calculation is based on the 13 million hectare lantana estimation from a research article (Sharma *et al.*). The surveys will also help in understanding and then drawing up local plans to eradicate lantana.

A local plan also needs to be drawn out before hand for supply of native seeds and saplings for each area to be immediately replanted on the areas cleared off lantana. Local range offices along with NGOs and other volunteers can come together in creating a comprehensive plan across all the states.

However, this effort needs to be continued after the first round of lantana clearing, albeit at a smaller scale to monitor and weed out any regrowth of lantana for three seasons. Lantana doesn't grow well in shade, so once the native vegetation grows up, lantana doesn't find easy to germinate and grow big. Careful monitoring can eradicate it completely.

Can we find people to weed out lantana?

According to our calculation each state needs to employ 1 lakh people. These people need to work in various groups and assigned different areas.

Considering that these days our forests are hemmed in on all sides by huge towns and villages with considerable working class population, finding people to fight lantana won't be a problem. Also our women folk, can be engaged along with the men to eradicate lantana. When the men are engaged in digging and uprooting lantana, the women can sow seeds, water the area and plant native saplings. This will help the women to earn money and also be self-sufficient. This can be a great move towards **women empowerment**.

The big benefits of the Lantana Eradication program:

Massive job creation: Creation of **149.84 lakh man months** or **4495.4 lakh mandays** of job creation in the first year alone. **Twenty eight lakh** people will work simultaneously in a synchronised manner throughout the country for

5.35 months.

After the first round of lantana removal using the cut-root-stock method followed by sowing and plantation of native vegetation, periodic monitoring of the areas to check any regrowth of lantana needs to be done. Use of geospatial tools can be considered. The lantana regrowth should be immediately uprooted and again native vegetation should be planted in that area. This will help provide continuous employment. This will make the local people feel that there is a future in our villages.

Massive Spending:

This program will entail spending of **11238.5 crores** (Eleven thousand two hundred thirty eight crores and fifty lakhs rupees only) in less than six months time is going to give a boost to the rural economy. The multiplier effect on the economy due to this is going to be huge. It might be pertinent to mention that industry has recognised the purchasing power of rural India and is increasingly looking at rural India to sell its goods.

Stop migration from Rural India:

Such massive job creations will also help arrest migrations of people from rural to urban India.

Women Empowerment:

A lot of women can get work in this scheme. This will lead to more empowerment of women.

Less Man-animal conflict:

Immediately the benefit will be felt on the pasture lands where forage will be available. Similarly more green grass sprouting along with native vegetation will lead to more food supply for the wild herbivores leading to reduction in man-animal conflicts.

Wild Elephant surrounded by Lantana in Bandipur National Park

Any person killed in a man-animal conflict is given 5 lakh rupees. According to Chattishgarh Forest Minister Mahesh Gagda, 63 people were killed in man-animal conflicts in Chattishgarh in one year in FY 2014-2015. In Odisha alone, 660 peo-

ple were killed by elephants and 685 elephants were killed in the conflict in the last ten years. So the average number of people killed in Odisha per year in man-elephant conflict is similar to that in Chattishgarh.

According to R K Srivastav, Inspector General of Forests, Government of India, every year 500 people and 100 elephants are killed in man-elephant conflict. So every year, an estimated 500*5 lakhs = 25 crores is simply spent in compensation for the loss of life. There is further additional amounts of money spent in compensating for crop loss and damage to dwellings.

Considering that people often get enraged by a death of a person in man-animal conflict and cause damage to public property and light fire to vast stretches of forests as well as to Government offices, vehicles etc, the total losses incurred and money spent in man-elephant conflicts are much more.

During the harvesting period there is lot of crop raiding by elephants as elephants can get lot more calories from the crops. Earlier mostly bull elephants used to raid crops and females with small calves normally never ventured into crop raiding. However, with the major areas of forests overrun by lantana, there is very less of food species for elephants available inside the forests, so crop raiding has intensified. Clearing of lantana will make available more forage, increase species diversity and herbivores will not be forced to resort to crop raiding. So one can easily justify spending money in removing lantana by engaging the local people to help reduce such conflicts.

Less Farmer Suicides:

At present for each farmer suicide, the Governments invariably pay 3-4 lakhs and at times in much politicised cases, like the suicide of a farmer in a political rally, even 1 crore rupees. So clearing one square kilometre of lantana is going to cost the same as the compensation paid for 4 to 5 suicide cases. According to the NCRB (National Crime Records Bureau), 46 farmers commit suicide every day. However, it is another matter that not every farmer gets the compensation in time. Since lantana is estimated to cause crop losses to the tune of $37.8 billion USD every year ie. 241,920 crores of rupees per year, the crop losses are expected be arrested resulting in more farm income and farmer suicides are expected to reduce.

Budget for MGNREGA:

While presenting the Union Budget in Feb 2015, the Finance Minister Shri Arun Jaitley had promised to enhance the allocations to MGNREGA by Rs. 5000 crores on top of the allocation of Rs. 34,699 crores. The Government can also use the CAMPA (Compensatory Afforestation Fund Management and Planning Authority) funds. At present 38000 crores of the CAMPA funds are lying unused and fresh accrual of compensatory levies and interest on accumulated unspent balance, will be of the order of approximately Rs. 6,000 crore per annum. So funds is not a problem for fighting lantana. Given the huge amounts of savings expected, this seemingly impossible task should be attempted with due planning.

It might be pertinent to note that when Shri Atal Bihari Vajpayee had announced the Golden Quadrilateral ie. the road building program to connect the four metro cities at a cost of Rs. 54,000 crores of rupees, people had accused him of day dreaming. Today we are reaping the benefit of that grandiose dream.

Will the current Prime Minister of India Shri Narendra Modi dream such a big dream to cleanse Wild India of this noxious weed, nurture it back to health and thereby bring in all round benefits to the economy and create a new and healthy India?

Obituary

Former President of India, Dr. APJ Abdul Kalam passed away on Monday, 27th of July, 2015 in Shillong while delivering a lecture at IIM on how to create a liveable planet. He was 83 years old and succumbed to a massive cardiac arrest. Dr. Kalam was born on 15th of October, 1931 in Rameshwaram and was the 11th President of India from 2002 to 2007.

Contemporary India hasn't seen a man with great inner strength and vision than Dr. Kalam. Like Karna in Mahabharata, who couldn't remain anonymous despite being reared by a charioteer, Dr. Abdul Kalam broke through the barriers of poverty, class divide, lack of facilities as well as many other obstacles to successfully energise India's space dreams and become the President of India. Not content with remaining as the President of India, he moved on to conquer the hearts of the people.

If we would have been born in a humble family like Dr. Kalam's, I suspect we would have remained imprisoned in the all-pervasive negativity. He broke barriers by his thoughts, vision and perseverance. I hope we all can learn to dream from him. After all, poor indeed is a man who doesn't have dreams.

Son of a boatman, May your spirit continue to guide us and prod us to dream for a better future for mankind and for a better tomorrow, so that your unfinished lecture and agenda on how to create a liveable planet will be brought to fruition by the current and future generations.

Rest in Peace Dr. Kalam!

The Valley of the Divine Bhagirathi - a paradise amidst changing climatic variables

By - Dr Nishikant Gupta / Dr Krishnendu Mondal

"Utilize your senses…Mother Nature will not disappoint you". An advice I hold dear to my heart till today. A simple stop over for a cup of tea near a river can reveal what hours of scanning a mountain cliff from a vantage point cannot. Staring down the deep valley provided that perfect sight – a family of Near Threatened Himalayan gorals (*Naemorhedus goral*) heading towards the majestically flowing Nayar River. It was a treat for the eyes. The Himalayan gorals, renowned for their acrobatic skills on steep, near vertical cliffs were strolling casually on a river bed…a rare sight indeed, and the perfect start to my journey.

A family of Himalayan gorals on the Nayar River bed

"We are in heaven's abode"; proclaimed the driver of the vehicle. The very next moment I was jolted awake by the screeching of the brakes. Hurriedly trying to get hold of my scattered senses, I looked at him ready to give him a piece of my mind; now staring and grinning at me. I looked straight at him, and then followed his waving fingers pointing beyond the windscreen of the vehicle. The scene in the horizon was one which would put a satisfying smile on the most experienced Himalayan researchers…and I was just an amateur! The snow-clad mountains glittered in the horizon, as if mysteriously signalling to the moving clouds. The tall trees with long side branches, their dry leaves demarcating the road's edges, the eroded side hills staring bare at you…they all welcomed you with open arms. If there was ever a paradise, this was it, and I was right in the middle of it.

I slowly got down from the vehicle, keeping an eye on the moving clouds. It was a glimpse waiting to be cherished, before the playful clouds took control of it all. "The clouds are heading our way, Sir", announced the driver. "We must get going", he continued. Reluctance got the better of my decisions and I decided to stay on for those extra few minutes. "We will be fine", I said like a know-it-all.

This is where one goes wrong in the Indian Himalaya…just when you think you know what you are doing; nature plays its mischievous tricks and gets the better of you.

The Indian Himalayan landscape

We were soon engulfed by a thick fog. The next three-quarters of an hour consisted of driving in a near-zero visibility condition…windows open…the driver and I avoiding the 100 feet drop below. An experienced researcher and a good friend had once advised me, "You do not dance around with nature…and definitely not while working in the Himalaya"!

Dense fog engulfing the road ahead

My visits to the Indian Himalaya always intensify my fascination and respect for this region and its people. One is always mesmerised by a horde of extraordinary and charismatic wonders, be it the sheer beauty of its deep valleys, its majestic rivers, or the tranquillity one experiences while watching the evening *Aarti* on the banks of the Alaknanda and Bhagirathi Rivers in Deoprayag.

The Indian Himalaya is truly a paradise of sorts, both geographically and in terms of its wildlife. This region is home to the snow leopard (*Panthera uncia*), the highest predator and one of the most threatened animals in the world; the Himalayan musk deer (*Moschus* leucogaster), one of most solitary, elusive and threatened animal; the western tragopan (*Tragopan melanocephalus*), the rarest of all living pheasants with very restricted home range; the Himalayan monal (*Lophophorus impejanus*), the most beautiful bird in the Indian Himalaya; and the golden mahseer (*Tor putitora*), an endangered fish species which attracts recreational anglers from world over in its pursuit.

The Bhagirathi River is nestled in the north-western portion of the

Indian Himalayan state of Uttarakhand, originates from Gomukh (3, 900 m asl) in the Gangotri glaciers and is one of the holy shrines of the Hindus. Many devotees visit the region annually to seek blessings. The river travels for a distance of 217 km with an elevation ranging from 480 to 3,200m, forming a catchment area of just over 8,846 km^2.

The Indian Himalayan river

The Bhagirathi River meets the Alaknanda River at Deoprayag, a holy city for Hindus. The Bhagirathi River basin is rich in floral and faunal diversity. The basin serves as a migratory route for the endangered golden mahseer and the snow trout (*Schizothorax richardsonii*) fish species. The birds found here include numerous species from Schedule – I of the Indian Wildlife (Protection) Act, 1972. Inclusion of a species within this Schedule provides absolute legislative protection and highest penalties are levied on offenders. These species are the Indian white-backed vulture (*Gyps bengalensis*), Egyptian vulture (*Neophron percnopterus*), Cinereous vulture (*Aegypius monachus*), cheer pheasant (*Catreus wallichii*), western tragopan and the Himalayan monal. The mammalian species found here include the Schedule – I species such as the Himalayan brown bear (*Ursus arctos isabellinus*), Asiatic black bear (*Ursus thibetanus*), snow leopard, common leopard (*Panthera pardus fusca*), Himalayan musk deer, Himalayan tahr (*Hemitragus jemlahicus*), blue sheep and serow (*Capricornis thar*). The floral diversity includes that of the Indian maple (*Acer caesium*), Ativisa (*Aconitum hetrophyllum*), *Allium stacheyi, Arnebia benthami, Caragana sukiensis, Datisca cannabina*, *Epipogium aphyllum, Lilium polyphyllum, Nardostachys jatamansi* and *Picrorhiza kurrooa* (Source: Rajvanshi et al. 2012).

Nonetheless, the region is at the receiving end of multiple stressors we humans throw at it. Numerous scientists over the last few years have discussed these threats in great detail, (e.g. rapid increasing population, unplanned urbanization, numerous hydropower projects, direct and indirect sources of pollution, and land use change near critical habitats of threatened species). However, a potential threat which is fast approaching and which has ruffled sufficient feathers of policy makers, is the changing and unpredictable climatic variables. Although debatable, there is ample literature stating that India's greenhouse gas emission continues to increase despite the best conservation practices and efforts. Further, scientists have predicted a temperature rise anything between 3 to 5 °C by the year 2100. This is alarming as such a fluctuation can give rise to devastating floods supported by rapid glacial melt in the Indian Himalaya. There is also a long term possibility of decrease in water flow to the perennial rivers originating here, and which are the lifelines of millions of people not just in the region, but also in downstream reaches.

"We know so much, see so much, yet do so little, why?" asked my 16-year old cousin last summer while flicking through my field photos showing anthropogenic impacts on Himalayan rivers. "We are doing so in bits and pieces, and will continue to do so", was my quiet reply. But a thought bounced around my head all night long, "I hope we do…and not just in bits and pieces".

It was not until eight months later when I was given the golden opportunity by the Wildlife Institute of India (WII), Dehradun to work on one of their flagship projects, the National Mission for Sustaining the Himalayan Ecosystem, or NMSHE as we so proudly call it. The Prime Minister's Mission on Climate Change has launched this project, and it is being implemented by the Department of Science & Technology (DST).

The project "Assessment and monitoring of climate change effects on wildlife species and ecosystems for developing adaptation and mitigation strategies in the Indian Himalayan Region" aims to understand the complex processes affecting the Himalayan ecosystem and evolve suitable management and policy measures for sustaining and safeguarding it. The main goal of the project is to develop strategies to mitigate climate change effects on wild animal and plant species and ecosystem in the Indian Himalayan Region (IHR). The broad objectives of this project are: (a) identify the drivers of landscape change (climatic and anthropogenic) in the IHR and their effects on the ecological and social systems; (b) conduct focussed research on wildlife aspects (terrestrial and aquatic fauna, micro flora and their habitats) and human dimensions in IHR for framing evidence-based policy measures; (c) develop monitoring and Decision Support Systems (DSS) for indicator species in the IHR; (d) undertake climate change scenario analyses and visualization for predicting potential effects on fauna and ecosystems as a strategy to communicate with stakeholders and to influence policy and decision making; (e) develop spatial and inter-operable database to facilitate and policy decision making; and (f) build capacities within WII and of other stakeholders for sensitization and development of action plans for climate change impact mitigation and to enhance capabilities for negotiations at the national and international forums.

A cohesive team of highly experienced and expert faculty members, participating organizations (State Forest/Wildlife Departments of J&K, HP, UK, Sikkim and Arunachal Pradesh; State Biodiversity Boards of Himalayan States; GB Pant Institute for Himalayan Environment & Development, Almora; Indian Institute of Tropical Meteorology, Pune; National Botanical Research Institute, Lucknow; Birbal Sahni Institute for Paleobotany, Lucknow; Doon University, Dehradun; Uttarakhand State Forest Department; Uttarakhand State Biodiversity Board; and University of British Columbia, Canada), project scientists, project associates, project fellows and project assistants are working tremendously hard to make this project a success story.

The programme has identified four major themes, *viz.*, terrestrial ecology, aquatic ecology, spatial ecology and human ecology. The research team includes 3 Project Scientists (spatial ecology, climate change and aquatic ecology), 4 Project Associates (Fauna, Flora, Spatial ecology and Human ecology), 8 Project Fellows and 8 Project Assistants. Some of the aspects of the project which are extremely vital for the region, and ones which are close to my heart are detecting and decoupling natural and anthropogenic induced signals of global environmental changes in the Indian Himalaya; and generating a strong data base through monitoring and analysis, to eventually create a knowledge base for policy interventions.

It has to be highlighted that various government and non-government organizations have already been fighting a challenging battle on a daily basis to protect the Indian Himalayan region. The never-give-up attitude of some of these organizations is indeed credible. The NMSHE project is going to substantially add to their efforts and will strive to achieve a protected and conserved Indian Himalayan region for generations to come.

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Conservation News

Concept of differentiation is cardinal to UNFCCC mandate, says Javadekar

Prakash Javadekar's Statement at the Informal Ministerial Consultations at Paris

India's minister for Environment, Forests and Climate Change, Shri Prakash Javadekar made a statement at the Informal Ministerial Consultations at Paris and said that we should not go back to Pre-1992 days with no differentiation as the concept of differentiation is cardinal to UNFCCC mandate. Hence there shouldn't be any attempts to dilute differentiation. Rather it should be reflected across all elements of the new agreement. The annexes are an important part and basic structure of differentiation and as such we should not play with the basic concepts and the pillars on which UNFCCC edifice of climate action is based. Agenda 21 has clearly stated that developed countries accepted responsibility for finance and technology support. So he strongly felt that developed countries should not now back out and change the very edifice on which all the talks and discussions have centered for the last few decades.

He also pointed out that "even Montreal Protocol has the concept of incremental cost. The UNEP and IPCC reports point to the emission gaps. By diluting differentiation, the world will be destroying the principle of Additionality, UNFCCC, Agenda 21 and it will impact Biodiversity agreement, global environment facility and many other international treaties. The provision of additionality of finance very clearly states that it is over and above normal business channels and it is over and above ODA."

India's environment minister took a stand that countries are aware about climate change and taking action voluntarily and hence should be appreciated. He said, "We must therefore, welcome that all countries are taking action and we should limit Paris to that."

Shri Javadekar pointed out that the present per capita emissions and cumulative per capita emissions upto 2012 are extremely important indicators.

He pointed out that India is in a unique position, the Minister said that India despite being a major economy and despite being on a development path is a poor country. "We have 17% of the world's population, 17 % of the cattle population. Both require land, water and food. We have only 2.5% of the world's landmass and we have only 4 % of water and therefore, we have challenges. But we are addressing them in our own way, and successfully.

On every parameter, we are a developing country, and poverty eradication is our main challenge and we are committed to deliver on that in a short span of time. Poverty eradication is our main aim. We have 50 percent rural households, i.e 90 million houses are not 'pucca' houses but 'kutcha' houses. 90 million households are deprived, as they are lacking in one of the basic development indicators. 90 million households depend on manual casual labour. 130 million families have a main earning member who earns less than 3 dollars a day. 60 million households have no toilets. 300 million people don't have access to power. 80 percent people do not have motorized vehicles. 90 percent people don't have refrigeration."

Shri Prakash Javadekar said that despite this, India under Narendra Modi Government is doing a laudable job and is taking its own climate action with conviction "on our own volition, with our own resources".

He once again reminded that India is taking great steps towards renewable energy. "We are walking energy efficiency path aggressively and we will reduce our emission intensity. But that is what India is doing on its own. Developed countries need to do it vigorously."

Shri Javadekar further said "We have launched world's one of the largest renewable energy programmes of 175 GW, and it

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is essentially a pre-2020 action. We have given weightage to afforestation at 8.5% for the first time, and 9 billion dollars are reserved for that in the 14th finance commission and 6 billion dollars will be unlocked through Compensatory Afforestation Fund bill for afforestation. We have launched a scheme of urban forestry, school nursery, afforestation on banks of Ganga, PPP for afforestation on degraded land, and National Highway Authority of India has also decided to green the sides of 90,000 km of highways. India has launched the clean Air Quality Index and is monitoring highly polluting industries on 24/7 basis. Clean Water is our priority and Ganga and other rivers' cleaning is a major initiative. For promoting Clean energy, we are giving subsidy for electrical vehicles. We have brought in a law for e-rickshaws. We are practicing clean coal. We have quadrupled the coal cess. The waste management rules have been revamped which will take care of Methane and it will be managed properly. The smart cities building code, affordable housing, railways with solar tops and giving up LPG subsidy are new initiatives".

Govt. launches TEEB-India Initiative to highlight Economic Consequences of Bio-diversity loss

Government of India launches TEEB-India Initiative (The Economics of Ecosystems and Biodiversity) to highlight the economic consequences of the loss of biological diversity and the associated decline in ecosystem services.

TEEB-India is focused on forests, inland wetlands and coastal and marine ecosystems. TEEB-India Initiative has been launched under the Indo-German biodiversity programme and the technical cooperation is provided by GIZ.

On September 2015, India is hosting the Brazil-India-Germany TEEB Dialogue where the outcomes of 12 pilot projects from the three ecosystems will be analysed and released. The overall study report will be released at the 21st session of the UNFCCC CoP being held in November-December, 2015 at Paris.

some of the projects look at the ecosystem services from Western Ghats, application of economic approaches to man-animal conflict, effectiveness of mangrove ecosystems, assessment of the value of by catch and the impact of seasonal ban on fishing, economic impact of restoration of wetlands etc.

6 New species of Spiders found in Kerala

Monday, July 27, 2015

Research conducted by Biodiversity Research Centre of Christ College, Irinjalakuda have found 6 new spider species. These new species have been spotted at Harithavanam also knows as Kuttivanam, located near the banks of the Aluva Sivarathri Manappuram in Kerala.

The researchers have listed the six spider species to be under the genus Chrysso, Dendrolycosa, Tetragntha, Trachelas and Argyrodes.

Chrysso: This tiny spider builds small webs in between grass blades to catch their prey. It is characterized by black glossy body and brownish legs.

Dendrolycosa: These spiders feeds only on insects in water bodies. It is mainly brown in color, but has white lines on its body and visible spines on its legs. The eight eyes are located in two rows of inverted U-shaped pattern.
Tetragntha: Two other species belong to this genus. The yellow coloured long jawed spider is characterised by four black

Conservation News

spots on the back of their abdomen and black bands on the joints of legs. The dorsal surface of abdomen of green-coloured long jawed spider is covered by white coloured scales.

Trachelas: A member of ant mimicking spiders characterised by the presence of eight diamonds like sparkling eyes located in the anterior part of dark brown head.

Argyrodes: This genus is said to be associated with the family of black widow which is known as world's most venomous spider. It is only as big as a housefly and hunts for small prey on grassy greens.

T-24 Not a man-eater says NTCA

The National Tiger Conservation Authority has ruled that the Ranthambhore tiger T-24 which was branded as a man-eater and shifted to Sajjangarh Zoo is not a man-eater and wants it back in the jungle. It has questioned why the tiger was shifted to a zoo rather than to another forest.

The NTCA has come down heavily on the state forest department of translocating a tiger without its permission. It said that only a text message was sent to NTCA about the death of the forest guard stating that a report will be sent shortly.

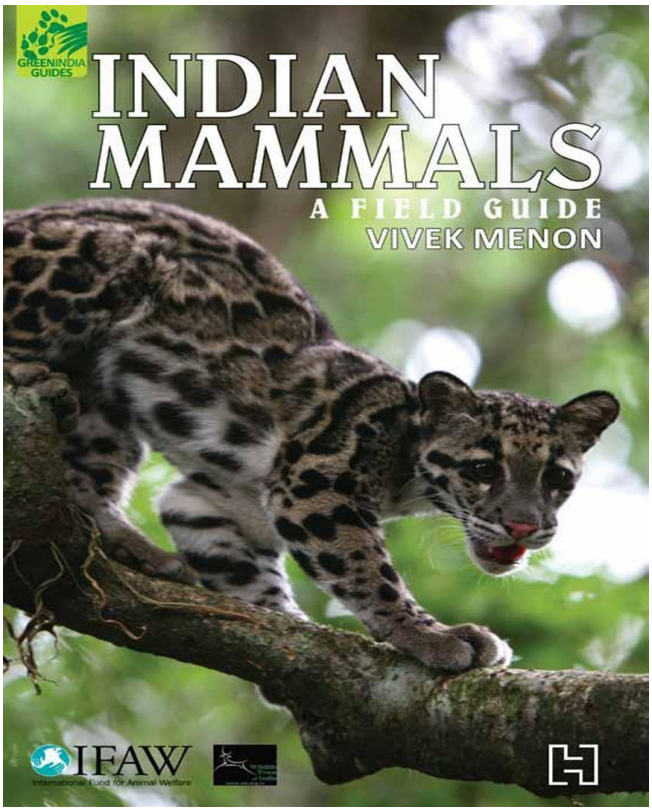
The NTCA has said that the three attacks on people which formed the basis of declaring T-24 as the man-eater, had considerable gaps between them. Further it said "such incidents may be more closely described as consequences of chance encounters due to excessive human proximity to tiger". It has also asked to regulate the unrestrained tourism activities going around Ranthambhore.

There is a continuous traffic of people to the temple inside Ranthambhore. That has to be stopped. Even so-called civilized well-to-do people start elbowing each other when they are standing in a cramped line to board an aircraft. One shouldn't forget that we have to respect the minimum personal space of each species. Despite many so-called experts linked with Ranthambhore swiftly branding T-24 as a man-eater, it is good that there is a sane voice in form of NTCA. Though the supporters and detractors of the tiger T-24 have been emotionally arguing this case for sometime. This case brings to the fore the systemic changes that are required to be carried out for Ranthambhore Tiger Reserve. Hopefully, the NTCA letter triggers those changes for a healthy Ranthambhore Tiger Reserve.

http://www.indiawilds.com/forums/showthread.php?16738-T-24-Not-a-man-eater-rules-NTCA

Book Review : Indian Mammals - A Field Guide By Vivek Menon

I had bought this book as soon as it came out in 2014. However, I must confess that the moment I opened the contents chapter, the colourful shading of various chapters made me feel that it was meant for kids. A casual flipping of the pages with lot of colour photographs, some in rectangle and others in oval just made me nervous. There are some pages marked as field notes with illustrations which made me feel that it is targeted towards the cartoon loving kids generation. Somehow its aesthetics didn't give a feeling that this book is meant to serve as a reference book.



Since I was about to leave for an assignment, the book remained unread. It was much later this year when I picked it up and found that this book has got a lot of material. The author Shri Vivek Menon would have put lot of painstaking efforts to compile this book "Indian Mammals – A Field Guide". Published by Hachette India, this book has 528 pages with over a thousand photographs and should readily help people identify the various sub-species of mammals found in India.

The author has included general behavioral aspects of the mammals in the initial stages of the book for enthusiasts to get a quick idea. For example understanding the age of mammals by observation, alarm signs, track/paw prints, interpreting feeding signs etc will immediately enhance the knowledge of beginners. Peer-reviewed information have also been provided on the various aspects including diet and foraging, vocalisations, reproductive strategies as well as threats and conservation.

Many species covered in this book, from Whales, dugongs and dolphins to the Takin and Serow may have not been seen even by the avid wildlife enthusiasts and researchers. Since along with the species there is a geographical map of India to

Irrawaddy Dolphins in Sundarbans

Book Review - Indian Mammals - A Field Guide

show the distribution of the species, this book will help in appreciating the amazing bio-diversity of India.

Flehmen Response

Useful contacts of various scientists in relevant sections have been provided for personal communication. It is good that references have been given in the End Notes and also select bibliographic information is provided for further research.

"Indian Mammals – A Field Guide" is priced at Rs. 850/-. However, I found that it is selling at Rs. 544/- in amazon.in . I feel it is fairly priced and wildlife enthusiasts and photographers as well as the layman should have this book in their book selves. And if you are a e-reader, then the Kindle version of this book is also available.

IndiaWilds App for Android Mobile

In India most of the internet penetration is happening through mobile phones. And the existing users who have access to desktops and laptops are becoming much more mobile then they used to be a few years ago. So to raise awareness and reach out to more people we need to adapt ourselves and make IndiaWilds easily accessed through a mobile phone using android OS.

Today, I am pleased to announce that we have created a mobile phone app so that people can access IndiaWilds anytime, anywhere without being tied to a computer. No need to type. One can access at the click of a button.

We have developed this app through Business Compass LLC a company based in Randolph, New Jersey, United States so that we create a good app.

Awareness is the first step before a person can become a champion of wildlife. I hope this will help us in reaching out to more people to raise awareness and make a real impact on the conservation landscape. If you have an android device then please download the app from this link:

https://play.google.com/store/apps/details?id=com.businesscompassllc.indiawilds

Equipment Discussions -

Go Pro Hero4 Session

Go Pro has announced a smaller version of its popular Hero 4 camera. The Go Pro Hero4 Session is 50% smaller than the Hero 4 and at 74g it is 40% lighter.

This camera can click 8 megapixel or 5 megapixel still images and record videos that are maximum 1080p ie Full HD.

At 1080p you can select either a medium angle of view or an ultra wide view. At 1080p the maximum frame rate is 60fps.

This camera has an internal battery. It is waterproof upto 33 feet. It has only one button to power up as well as record.

It has Wi-Fi and blue-tooth so that you can connect your smartphone or use the optional remote to change the settings.

The Go Pro Hero 4 was already small. So for some people the Hero4 Session may be too small. Nevertheless when attaching it to your hand or head, the smaller size may be preferable to some people.

Go Pro has also launched floatation device for the Go Pro Hero4 Session so that if you accidentally drop in water, the camera will float. It also has an orange colour, so that one can spot it easily.

Go Pro has also launched a lens replacement kit for the Hero4 Session, so that if the front lens element gets scratched, then you can replace the glass lens cover by removing the screws using the screwdrivers.

Equipment Discussions -

The Go Pro Hero4 Session costs 399 USD. You can buy it here:

http://www.bhphotovideo.com/c/buy/Hero4_Session/Ntt/Hero4%2BSession/N/0/kw/search/BI/19990/KBID/13252/DFF/d10-v1-t12

Natural History -

COUNTRY NOTEBOOK: M.Krishnan: 'Herd responsibility' (Gaur, Elephant, Blackbuck)

The Sunday Statesman: 05-July-2015 (shared by Shri. Saktipada Panigrahi)

"MANY experienced observers have said that in a herd of Blackbuck leadership is usually vested in an old doe. Among other animals that go about in parties and herds, consisting of one dominant male and his "harem", the same matriarchal tendency has been reported - for example, among Elephants and Gaur. No doubt this is substantially true, but observation of the behaviour of herd-bulls (in Elephant and Gaur herds) suggested to me that the position is by no means as simple as stated.

It has been said that a tusker or master bull of a gaur herd is always in the rearguard, and seeks independent escape when the alarm is sounded, looking always to the safety of his hide and never caring to look after the rest of the herd.

That, like many sweeping statements on animal behaviour, is not true. While it is generally valid, there are occasions when the herd-bull does take upon himself the responsibility of covering the retreat of the herd - it is likely that such instances are due both to some individual peculiarity of the herd-bull and to circumstances.

Anyway, I have seen a Gaur bull advance towards a party of men and stand his ground truculently till the rest of the herd had made good its hurried escape, and another time I saw two herd-bulls patrol the periphery of a hunched group of Gaur when a Tiger was around.

And following a herd of Elephants, I had a rather frightening experience. The tusker, a singularly powerful one, not only guarded the retreat of the herd but actually urged the cows on, by voice and physical hustling; when they were all gone, he belligerently uprooted a young tree and kicked it about in front of us (Gaur bulls, too, indulge in similar demonstrations at times), then slowly followed the herd, turning back repeatedly to halt us.

I should like further opportunity for the study of such behaviour before writing about this aspect of herd-mastery in ele-

phants and gaur. However, I have been experimenting, for the past few months, with Blackbuck, and can say while alarm is usually sounded by the doe, the herd-buck assumes command of the retreat as often as not.

As others have pointed out, it is not any one doe that is always on guard duty when a herd of Blackbuck is grazing. The master-buck may be with the does, or else on the outskirts of the group by himself (or with one select doe). An adult doe is on the watch while the rest of the herd grazes; she grazes when another doe takes up the watch; at times the buck, too, takes his turn at watching. I am sorry to be so full of guarded qualifications, but it is just not possible to be more definite.

My method was to creep up gradually, behind cover, towards a grazing herd, and to hide behind a bush. Then I would excite an alarm, varying the mode of excitement each time - by shaking the bush, on waving a white handkerchief, or whistling. Sometimes the buck would be the first to spot me, but more often the watching doe. Then the does and young would bolt; after the usual preliminary "high jinks" they would bolt in a herd, though one or two of the does might not take the same line as the rest but scatter sideways. At times, especially when he was in the middle of the herd, the buck would bolt with the main body of the herd, but more often he would stay behind to round up the does that were taking an independent line, and chase them in front of him towards the rest of the herd.

Both the buck and does sound the alarm with the same grunting snort, except that it is more a grunt than snort when the buck sounds it, and a sort of snort when a doe sounds it. But the buck directing a scattering doe to follow the main body of the departed herd prances around her with the same strutting gait that he uses during the courtship display, tail curled over the rump, nose high, limbs moving in a high, stilted action - the only difference I noticed between the courtship display and this hustling was that when hustling a doe he does not droop the ears. This rounding up of recalcitrant does was done when the source of alarm (myself) was at some distance; when the alarm was urgent, he drove the does ahead at a gallop, with lowered head and horns, even prodding them at times.

I conducted these experiments at Guindy Park, where the territory of each herd is highly limited. I do not know to what extent the buck's behaviour will differ or if it will differ at all, when the terrain is unlimited, as it is under more natural conditions."

-M. Krishnan

This was first published on 28 February 1960 in The Sunday Statesman

Natural History -

White-rumped Munia (*Lonchura striata*) feeding on green Algae
By Samrat Sarkar

Very close to where I live I have seen nests of different kinds of birds in the monsoon periods; specially, in front of our house a flock of White rumped Munia (WRM) make their nests every year, sometimes on deodar trees, sometimes on plantations of pointed gourds (parwal), in the boxes hanging from electric poles etc.

The WRMs feed mainly on grass seeds, on young bamboo shoots etc. They feed their nestlings small insects; but they eat another food regularly on the basis of availability- that is green algae (Spirogyra SP.). Mr. Salim Ali has also mentioned this in his famous book (Pillai, JBHNS, 65:490). This is obviously a rather unusual feeding habit of the WRMs. It is heard that they feed on the green algae to meet their regular protein requirements.

Out of about ten birds I have exactly identified a particular WRM with a visible white distinguishable spot just below its left ear.

WRM touched water with its beak

Natural History -

White-rumped Munia (*Lonchura striata*) feeding on green Algae

WRM pulled out algae from water

WRM shakes the algae

Natural History -

White-rumped Munia (*Lonchura striata*) feeding on green Algae

By Samrat Sarkar

WRM swallowing algae

WRM swallowed algae

Wildlife Photography -

Kabini elephants by Shyamala Kumar

Elephantscape by Samrat Sarkar

Wildlife Photography -

Leopard in Ranthambore by Vipin Sharma

Blue Bull by Rajbir Oberoi

Wildlife Photography -

Chital carrying fine antler by Saktipada Panigrahi

Black headed Ibis by Sandipan Ghosh

Wildlife Photography -

Indigo Bush Frog by Abhishek Jamalabad

Treehopper by Prajwal Ullal

Ghost Crab by Dr Hari Venkatesh K R

I look forward to your inputs and support in preserving the last tracts of wilderness and wildlife left in our beautiful country. For other interesting articles and images check - ***http://www.indiawilds.com/forums/***

To post in the IndiaWilds forums, you can register free of cost using your Full Name as user id at -

http://www.indiawilds.com/forums/register.php

If you are already a member of IndiaWilds and have forgotten you user id and/or password you can mail administrator@indiawilds.com

Regards,
Sabyasachi Patra

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