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Honouring Nature Conservation

TIGERS OFFER 2-MILLION DOLLARS FLOW BENEFITS

ECONOMIC VALUATION OF TIGER RESERVES IN INDIA

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It is first ever study to provide quantitative and qualitative estimates of the natural capital stored in selected tiger reserves of India.

It is to make benefits emanating from and embedded in these tiger reserves visible to economies and society.

Per hectare: The study findings indicate that the monetary values of flow benefits emanating from selected tiger reserves range from US$ 10 to US$ 21 Million annually. In terms of unit area, this translates into US$ 6,000 to US$ 18,500.

In addition, selected tiger reserves protect and conserve stock valued in the range of US$ 25 million. In the light of growing awareness of life-supporting functions of many ecosystem services and advanced technology to make use of genetic diversity, the economic value of this stock is likely to appreciate rapidly.

Intangible: Study findings also indicate that a large proportion of flow benefits (as well as stock) are intangible, and hence often unaccounted for in market transactions. Economic valuation can help in recognizing these intangibles and hence have them considered in policy actions.

Further, adequate investment in natural capital contained in tiger reserves is essential to ensure the flow of ecosystem services in future, and is economically rational based on the study findings. A focus on ecosystem services also has the potential to inform zoning and management of tiger reserves at the local landscape level, create partnerships with other local policy-makers to improve effectiveness and ameliorate funding for such areas.

This edition of Conservation Times is also dedicated to golden jubilee (1973 - 2023) of Project Tiger. The event was organized during 2nd week of April 23.

Landscape: Where justified by broader benefit, economic valuation consequently can help in establishing effective policies and

Continued on page 3

Corbett Tiger Reserve is famed for Red Jungle Fowl, e-Bird.

THEME FOR THE NEXT ISSUE

We received many positive comments about our last issue that celebrated the 50th anniversary of Project Tiger. Because of the tiger's popularity, we have decided to make 2023 the Year of the Tiger in Conservation Times. Each issue for the rest of the year will include articles on tigers and tiger conservation.

However, we will also continue to focus on a different theme for each issue of CT. The theme for the next issue is human/wildlife conflicts.

As usual, we welcome good articles on any wildlife or environmental topic in addition to those on the theme for the upcoming issue. If you would like to write an article, please request a style sheet for Conservation Times from emccrea@eecg.org

The deadline for submitting articles for the next edition is the end of May 2023.

GOLDEN JUBILEE CONGRATULATIONS

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India has registered its leadership over the global wilderness. Prime Minister, Narendra Modi has led golden jubilee celebrations of Project Tiger during April 2023 thereby pronouncing the country's firm conviction to conserve this iconic species. India would also start releasing its Tigers in such country's wilderness where the species had become extinct: re-wilding. Kudos to all those who have been shedding sweat, almost round the clock, to combat menace of poaching and protecting India's forests. Some of them have been recognized and accorded praise at an event led by the Prime Minister. A convincing role for the Government and it deserves appreciation. As a curtain raiser to golden jubilee (1973 – 2023), we had carried analytical reports about Tiger Conservation in the previous issue of Conservation Times. This is being followed in this issue by outlining the economic gains from Tiger Reserves. Dr. Madhu Verma deserves plaudits for having executed path breaking studies on some selected Tiger Reserves. She did it while she taught at Indian Institute of Forest Management, Bhopal. It is like a new discovery about forest regimes offering inestimable benefits to people. They generally remain unrecognized. Reason?

Priority to forest management continues to be low. It is in recent years that the Climate Change cry has alerted national governments in several countries. Concern for forest conservation, therefore, appears gaining a new conscious approach. However, the divide between mass-scale consumers across urban areas and stake-holder consumers in rural areas is striking, pointedly in a country like India. Villagers living around Tiger Reserves face continuous threats from wild animals. The stake-holders deserve a share in the benefits from revenue generated through conservation tourism. ◆

Rhino lives with Tiger in Kaziranga, Google

mechanisms for payment of ecosystem services to equitably share benefits and costs of conservation. In order to conserve biological diversity and ensure the flow of a wide range of ecosystem services from tiger reserves, it is imperative to expand the network of tiger reserves as to make them comprehensive and representative.

Further, it is essential to integrate management of tiger reserves into the broader landscape and enhance/restore ecological connectivity among these tiger reserves and their wide environment. Connectivity and exchange of gene-flow is critical for increasing ecosystem resilience, their ability to mitigate environmental risks.

Services: Acknowledging our limited understanding of natural processes and their associated values, the study uses a VALUE+ approach. The 'VALUE' represents all benefits for which monetary economic valuation is possible and conducted, while the '+' represents all those benefits for which economic valuation is currently not possible either on account of lack of accepted methodologies, knowledge and/or understanding.

6 TIGER RESERVES CAUSE SMILES

The Flow Benefit Study provides conservative estimates of the economic value of six selected tiger reserves in India:

Swamp Deer in Kanha, Google

* Corbett

* Kanha

* Kaziranga

* Periyar

* Ranthambhore

* Sundarbans

Apart from quantitative and qualitative estimates of ecosystem services from selected tiger reserves, the study also explores other dimensions of values. It does so through mapping of ecosystem services in two of the selected tiger reserves and estimating what it would cost to re-create a tiger reserve.

It is important to note that the objective of the study is neither to compare the benefits of the tiger reserve with any economic venture such as mining, nor compare the benefits across selected tiger reserves.

CORBETT TIGER RESERVE

A representative of Terai-arc landscape, Corbett is referred to as the land of roar, trumpet and song (attributed to tigers, elephants and birds respectively).

It is estimated that the Corbett Tiger Reserve provides flow benefits worth US$ 18 million hectare annually. Important ecosystem services originating from there include:

* gene-pool protection US$ 12 million.

* provisioning of water to downstream districts of Uttar Pradesh US$ 1.6 million and water purification services to the city of New Delhi US$ 67 million.

Other important services emanating from this Reserve include:

* generation of employment for local communities US$ 11 million.

* provision of habitat and refugia for wildlife US$ 34 million.

* sequestration of carbon US$ 32 million.

A Tea Garden in Periyar, Google

KANHA TIGER RESERVE

A typical geo-physiographical representative of the Central India Highlands, Kanha is internationally renowned for successful conservation of two endangered wildlife species, viz. the Royal Bengal Tiger and the Central Indian Barasingha.

It is estimated that the Kanha Tiger Reserve provides flow benefits worth US$ 1.8 million annually. Important ecosystem services originating from Kanha Tiger Reserve include:

* genepool protection US$ 1.35 million.

* provisioning of water to downstream regions US$ 63 million.

* provisioning of fodder in buffer areas US$ 61 million.

Other important services emanating from Kanha include:

* recreation value US$ 35 million.

* provision of habitat and refugia for wildlife US$ 33 million.

* sequestration of carbon US$ 24 million.

KAZIRANGA TIGER RESERVE

Kaziranga is a World Heritage Site inhabited by the world's largest population of one-horned rhinoceros. In addition, it also supports the population of tigers and elephants.

It is estimated that the Kaziranga Tiger Reserve provides flow benefits worth US$ 12 million /hectare annually.

Important ecosystem services originating from Kaziranga include:

* habitat and refugia for wildlife US$ 6.6 million.

* gene-pool protection US$ 5 million.

Other important services emanating from Kaziranga include recreation value, biological control US$ 2.6 million and sequestration of carbon.

PERIYAR TIGER RESERVE

Periyar Tiger Reserve is a representative of the southern western Ghats with high endemism.

Important ecosystem services originating from Periyar include:

* gene-pool protection US$ 8.6 million.

* provisioning of water to districts of Tamil Nadu US$ 4.1 million.

* provision of habitat and refugia for wildlife US$ 4 million.

RANTHAMBHORE TIGER RESERVE

Ranthambhore is undoubtedly the most popular tiger reserve and marks the transition zone between the true desert and seasonally wet peninsular India.

It is estimated that the Ranthambhore Tiger Reserve provides flow benefits worth US$ 10.5 million/hectare annually.

Important ecosystem services originating from Ranthambhore Tiger Reserve include:

* gene-pool protection US$ .9 million.

* provisioning of water to the neighbouring region US$ 14 million.

Ranthambhore Fort, Google

Boating in Sundarbans, Google

Road-block across Umred forest near Tadoba Tiger Reserve, Amrut Naik

* provisioning of habitat and refugia for wildlife US$ 22 million.

Other important services emanating from Ranthambhore include:

* generation of cycling of nutrients US$ 4 million.

* sequestration of carbon US$ 8 million, apart from housing the Ganesh Temple visited by about one million pilgrims every year.

SUNDARBANS TIGER RESERVE

Sundarbans forms the largest contiguous track of mangrove forest found anywhere in the world and is the only mangrove forest inhabited by tigers. It is estimated that the Sundarbans Tiger Reserve provides flow benefits worth US$ 1.4 million/ hectare annually. Important ecosystem services originating from Sundarbans Tiger Reserve include:

* nursery function US$ 6.3 million.

*genepool protection US$ 3.8 million.

* provisioning of fish US$ 1.6 million.

* waste assimilation services US$ 1.5 million.

Other important services emanating from Sundarbans include:

* moderation of cyclonic storms US$ 3.6 million.

* provision of habitat and refugia for wildlife US$ 4.4 million.

* sequestration of carbon US$ 5.4 million.

THE UMBRELLA

"Every dollar invested in saving the wild tiger also helps save many threatened species, and ecosystem services that are critical to millions of people," says the World Wildlife Fund report, "Beyond the Stripes: Save tigers, save so much more."

Tiger landscapes range from the world's largest mangrove forests in the Sundarbans, to temperate forests in the snowy mountains of Bhutan.

The report highlights that securing tiger landscapes could help protect at least nine major watersheds, which regulate and provide freshwater for up to 830 million people in Asia, including in urban areas across India, Malaysia and Thailand. Similarly, safeguarding tiger landscapes could, in turn, protect the last remaining forests critical for carbon sequestration, helping to mitigate climate change.

Tourism at its peak for Tigers, a scene in Tadoba Tiger Reserve, HV's records

TIGER'S GENETICS FACES QUESTIONS

By Harsh Vardhan
Email: birdfair1@hotmail.com

Harsh is a citizen advocate for wildlife conservation and is based in India. -- Editors

Can there be more white Tigers like the legendary Mohan? It was caught at age of seven months by Raja Martand Singh of Rewa on 6 June 1951 in forests adjoining today's Bandhavgarh Tiger Reserve. At first mating with a golden colour normal Tigress, it produced normal colour Tiger cubs. It was mated with its own daughter, Radha, and he sired a few white Tigers. They were named as Raja, Rani, Mohini and Sukeshi. It took place at fort Gobindgarh where facilities had been created for them to raise families.

The offspings moved to New Delhi Zoo and to the US. So the world started having white Tigers in various zoological parks. Mohan died in 1970 at age of 20, living in captivity.

What reason: White Tigers have been observed in the Sundarbans Tiger Reserve. In 2017, a white Tiger was photographed in the Nilgiri forests. A Black Tiger was observed in Simlipal Tiger Reserve. No more such cases came to light.

What caused Mohan to become a white Tiger? It remains unknown as scientific tests were hardly undertaken about its genes. Subsequent researches revealed that white strain in a common orange colour Tiger was due to any genetic variability caused due to inbreeding. May be it was a case of genetic recession? It was not an albino.

How are genes of the Tigers in the India's wild behaving? It needs to be examined at wider landscape level where the Tigers are getting dispersed. Today's wild Tigers in India owe their origin from an extremely small number of parents in certain pockets of forests.

In Ranthambhore Tiger Reserve, April 2023, Shikha Durlabhji

Same parents: Ranthambhore Tiger Reserve had 14 Tigers in its wild up to late nineties. They were products of parents hailing from the same stock and roaming around within the 392 sq., km., range of this reserve. Officials claim their number increased to about 110 by 2023. Do they all carry the same genetic order? It is a fact that the parents of all of them had been the same. So should diversity of blood line be questionable?

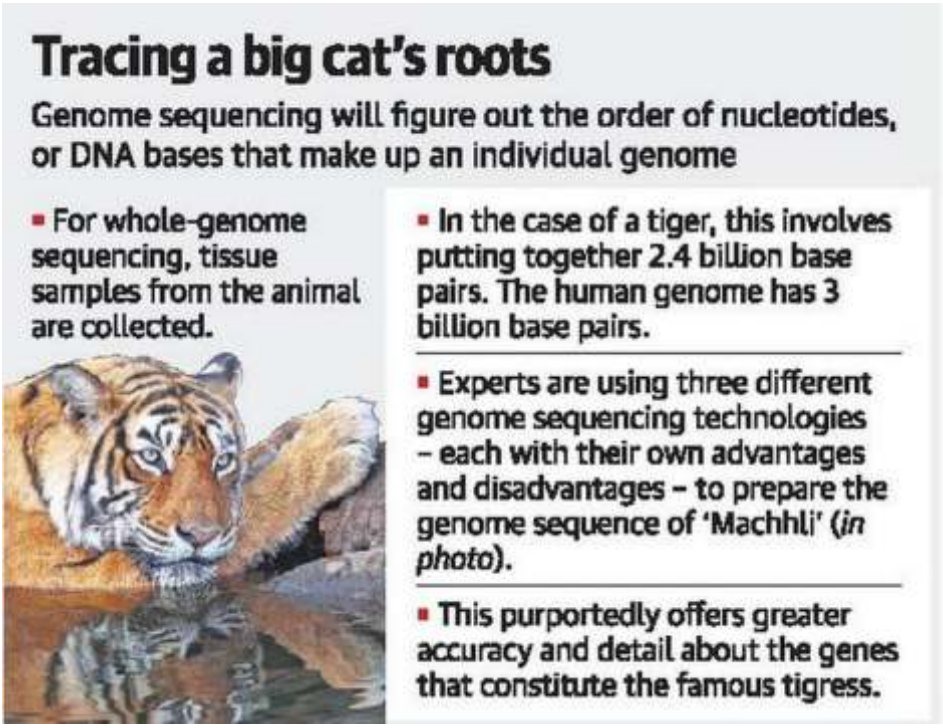
The case of white Tigers bred in captivity is much different. They were confined to captive conditions. So their genes received captive impacts – inbreeding was in vogue. The wild Tigers are claimed to be not prone to impacts as are received by their cousins in captivity. So is their genetic variety getting enriched and diversified – in wilderness? It is believed that the white Tiger variant is viable in the wild.

Reeta Sharma at Wildlife Institute of India, Heiko Stuckas at Senckenberg Research Institute, Ranjana Bhaskar at Zoological Survey of India, Chennai, Surendra Goyal, Imran Khan and Ralph Tiedemann scripted a research paper titled as "Genetically distinct population of Bengal tiger (*Panthera tigris tigris*) in Terai Arc Landscape (TAL) of India."

They analyzed "mtDNA polymorphisms" in 91 scats and 12 tissue samples of Bengal tiger (*Panthera tigris tigris*) populations across Terai Arc Landscape (TAL) located at the foothills of Himalayas in North Western India, Buxa Tiger Reserve (BTR), and North East India.

Isolation: In TAL and BTR, they found a specific haplotype at high frequency, which was absent elsewhere, indicating a genetically distinct population in these regions. Within the TAL region, there is some evidence for genetic isolation of the tiger populations west of river Ganges, i.e., in the western part of Rajaji National Park (RNP). Although the river itself might not constitute a significant barrier for tigers, recent human-induced changes in habitat and degradation of the Motichur-Chilla Corridor connecting the two sides of the tiger habitat of RNP might effectively prevent genetic exchange.

A cohesive population is observed for the rest of the TAL. Even the more eastern BTR belongs genetically to this unit, despite the present lack of a migration corridor between BTR and TAL. In spite of a close geographic proximity, Royal Chitwan Tiger Reserve (Nepal)



Want to know my DNA, come closer,
Harsh Vardhan

constitutes a tiger population genetically different from TAL. Moreover, it is observed that the North East India tiger populations are genetically different from TAL and BTR, as well as from the other Bengal tiger populations in India.

Territories: This leads us to acknowledge that wilderness has potential influence on Tigers and that Tigers of one landscape vary from others in far off landscapes. They represent geography dominated characteristics and therefore need not be considered to be translocated from any one region to any other region. They are highly territorial. The males have larger territories. They spray urine over tree trunks to mark their territories.

Just before the females enter their oestrus phase, they do scent marking over ground and tree trunks to make their presence known to the males around. Prey density is the main factor drawing a male or female in a particular region. This predator is celebrated to acknowledge its territories and know exactly where they would find a water puddle and where can they hide themselves when threatened.

Corridors make vital links for diversity of Tigers' genetic versatility. Corridors are stretches of land that enable Tiger movement between habitats, aiding in genetic diversity and improving local populations of the species.

Genome variation: The genome variation depends on some such aspects which seldom receive attention of Managers of Tiger Reserves. They can be continued loss of geographical connectivity, species' management, conservation action, anthropogenic pressures, etc. The gene flow becomes stagnant as animals are forced to remain confined in a limited forest cover. It leads to admixed ancestry

Tigers became extinct in a large geographic landscape, eg., Chittorgarh, Rawatbhata, Kota, Bundi, Tonk, Jaipur, Dausa, Keladevi, Mandarayal, Talab-i-Shahi, Dholpur and areas south of the Chambal river like Kuno Palpur, Shivpuri, Gwalior, Jhansi, etc.

Only Ranthambhore forest could sustain Tigers in course of past eighty years of extinction of the species in its adjoining and far off regions. It was left with 14 Tigers till end of nineties. Admirable and sustained management led this number to rise to 110 by 2023. As their population increased, they were forced to adopt new territories in some of the forest blocks where they had become extinct eg Keladevi, Mandarayal, Dholpur, Kuno Palpur, Bundi, Kota, etc.

India is racing forward at doubling Tiger numbers – statistical goal. The mammals are gaining new ground as they know they cannot survive within one forest block. What new management for them in new territories where prey base is scanty and protection measures are inadequate? They are exposed to intense anthropogenic pressures.

Questionable: I believe that connectivity through corridors, at one time, would have enabled Nepal Tigers to reach Tamil Nadu in southern most part of India. It would depend on plenty of prey base, availability of water and protection, factors Tigers know the best for own survival.

If so, the genetic diversity would have been the best in a period when Tigers were to travel such long distance of nearly 2,500 kilometers. Gone is that era as forest reserves today stand isolated.

Is it not leading to genetic disqualification for existing population of Tigers in India. And will it lead to abnormal births too. White Tigers may again surface up? If not genetic disqualifications would have crept in? Who to examine? The year 2023 is golden jubilee year of Project Tiger. Hope such aspects are scrutinized to ensure genetic characteristics of this mega predator remain intact.

PROJECT TIGER IS GLOBAL SUCCESS: NARENDRA MODI

By Editors of C.Times

India's Prime Minister, Narendra Modi

India's Prime Minister, Narendra Modi has announced that India's tiger population increased to 3,167 in 2022 which was 2,967 in 2018. Releasing a report on 'Status of Tigers, India 2022' in Mysuru, Karnataka, he took pride in the phenomenal success of the Project Tiger, which has completed 50 years.

Buoyed by the success, Modi exclaimed that protecting nature is part of Indian culture and hence India has achieved several milestones in wildlife conservation at the global level. He was leading a conclave organized to celebrate golden jubilee of project Tiger.

Largest range: The Prime Minister said that India, with just about 2.4 per cent of the world's land, contributes about 8 per cent of the known global biodiversity.

"Today, India is also the largest tiger range country in the entire world. Further, with about 30,000 elephants, India has the largest range of Asiatic elephants.

He added that similarly, India has the largest range of 3,000 single-horned rhinoceros population. This apart, India is the only country to hold the population of Asiatic Lions and their population has gone up from 525 in 2015 to 675 in 2020. The leopard population in India has also gone up by 60 per cent in just four years.

Ganga: Referring to the Government's programmes towards biodiversity regeneration, the Prime Minister said works are being done to clean up rivers. "Cleaning up of Ganga helped biodiversity regenerate and several endangered aquatic species have shown improvement. All these have been achieved due to the greater participation of people and the culture of conservation, which is intrinsic to every Indian. For wildlife to thrive, it is important for the ecosystem to thrive. This has been steadily happening in India," the Prime Minister detailed in his speech.

Calling on all the delegates from several tiger range countries in South-east Asia and other parts of the globe to offer a standing ovation to the tiger, Prime Minister, Modi threw light on the history of tiger conservation in India dating back to prehistoric times.

Safe habitat: "In India, Tiger conservation history goes back several thousand years. Rock paintings of tigers by prehistoric settlers have been discovered in Madhya Pradesh, Maharashtra and other parts of central India. Many communities in India worship tigers and consider them as part of their family. Tiger is also the "vahan" (vehicle) of Goddess Durga and Lord Aiyappa," Modi said.

Thanking the whole world for the success of this ambitious programme, the PM said, "The success of Project Tiger is not just the success of India but of the entire world. By doing so, India has not only saved the tiger population but also provided them with a safe habitat to thrive.

"Just as we are celebrating 75 years of India's independence, 75 per cent of the global tiger population is in India. Similarly, the expanse of tiger reserves across the country has also spread over 75,000 sq km besides witnessing a 75 per cent increase in their population over the last 50 years," he exclaimed.

"When a man wants to murder a tiger, he calls it sport; when a tiger wants to murder him, he calls it ferocity." **-- George Bernard Shaw**

"Those who foolishly sought power by riding the back of the tiger ended up inside." **-- John F. Kennedy**

BRAND VALUE OF TIGER RESERVES

By Dr. Madhu Verma and team, madhuver10@gmail.com

While teaching at Indian Institute of Forest Management, Bhopal, Prof. Madhu Verma undertook this assessment as part of Tiger conservation exercise.

Whether experts or visiting community, often it is asked: which tiger Reserve to visit? Now that total number crossed half a century mark of such reserves in India by 2023, it is more debatable.

A major aspect is about faunal observations at a reserve. Which wild species are to be best viewed and at least discomfort? Lodge-board remain equally significant factors.

A destination brand is a set of cultural and symbolic meanings related to a place. The tangible assets of the destination brand could include geographical features such as mountains, forests, historical sites, and attractions; intangible assets might include culture, customs, and history. Consumers going to a destination are seeking to experience tangible or intangible features that are different from those they can experience at home.

To explore the potential of Tiger reserves as destination brands, a pilot exercise was conducted for the six Tiger reserves by Dr. Madhu Verma and her team. An online survey was carried out to assess needs and expectations. The attributes captured in the survey primarily included, awareness, perception, intention to revisit and recommendation of the respective Tiger reserve.

Brand perception was asked for the destinations the respondents were aware of, whereas, intention to revisit and recommendation were administered only to the visitors of the destination brand. The reserves included were: Corbett, Ranthambhore, Kanha, Periyar, Sundarbans and Kaziranga.

The parameters used for Destination Brand Measurement were Awareness/Brand Identity, Image Attributes/Brand Perception and Recommendation and Willingness to Visit. Brand equity can be understood as a multi-dimensional construct composed of brand strength and brand value.

While brand equity deals with a consumer-based perspective; brand value is more of a company-based perspective. In case of Tiger reserves, judging through consumer perspective seemed more appropriate. As calculating brand value was not possible because the exercise was too data intensive, as the surrogate, brand equity was considered to measure Destination Brand.

The survey findings indicated that visitors to Tiger Reserves were to seek natural beauty and not just tigers. Tiger Reserves like Corbett, Ranthambhore and Kanha ranked high in brand awareness.

In terms of Brand Image, Sundarbans and Kanha were perceived to be unique destinations by 54% and 48 per cent respondents (higher than others).

In terms of presence of religious, historical and cultural places, Ranthambhore (49 per cent) stood out among the lot.

Tiger reserves like Corbett (60 per cent) and Kanha (63 per cent) were highly associated with scenic natural beauty.

In the management aspect, Kanha outperformed on the service related parameters.

Corbett, Ranthambhore and Kanha were perceived to be better on most of the parameters. The Brand Equity score was highest for Kanha (296) followed by Ranthambhore (258) and Corbett (228).

WHAT MATTERS MOST FOR GENOME STUDIES?

Tiger scat is the most easily accessible and used source of tiger DNA. However, it provides only low concentrations of DNA while blood and tissue provide whole-genome data. Not easy to procure blood or tissue samples.

Shed hair has been the most common source of DNA in the wild and provides five whole-genome sequences. Relatedness and lineage data can also be obtained from such genomes. They can be verified with data from an older study using tissues and records if maintained by the forest authorities.

To find out which sources of DNA could provide whole-genome data from wild tigers, a team of the National Centre for Biological Sciences (Bengaluru), officials of the Rajasthan Forest Department and researchers at Bengaluru's Medgenome Labs followed 34 tigers over a year in Ranthambhore Tiger Reserve.

They collected shed hair from each individual, picking up more than 5,000 strands left behind at 207 scratch posts, scats from nine individuals and blood or tissue samples from four tigers. The team extracted DNA from all these samples in the laboratory.

The team was delighted to find that their methods stood the scrutiny: hair did have valuable genetic information comparable to DNA from high-quality tissue.

This is the first time that scientists have derived whole-genome sequences from naturally shed hair in the wild.

The whole genomes of five tiger individuals that the team obtained from hair samples revealed a lot of detailed genetic information about Ranthambhore's tigers. Their genomic data showed high relatedness between pairs of tigers in the Reserve, suggesting that this population could be inbred.

Courtesy: india.mongabay.com

RANTHAMBHORE WHISKEY!

By Editors of C. Times

Good heavens! Tiger adventure is crossing limits to an extent that a liquor distilling company in India has launched a brand of whiskey in name of Ranthambhore, albeit Ranthambhore Tiger Reserve!

It is called as 'Royal Ranthambhore'. Described as 'India's finest yet' whiskey, it is a product by Radico Khaitan. It claims to be one of the top distillers in India in operation for more than seventy five years.

It calls its products as 'timeless brands' and already delivered in markets brand names such as Jaisalmer Gin, Rampur Indian Single Malt, etc.

It is described as premium category drink. The company hails the new whiskey as epitomizing 'royalty' and 'inspired by the majestic Royal Bengal Tiger.'

It is on Twitter as well: @Ranthambhore. Portrayed through a video showing pug marks of Tigers, then a Tiger is seen walking at ease, another Tiger is seen yawning, then appears the emblem of the product and finally emerges the 'geo coordinates of Ranthambhore Tiger Reserve.' The video show cases only this mammal.

The exposure falls on bacchanal idiom. An attempt to encash this Tiger Reserve to market liquor, it is too obvious that the company aims at gaining extra ordinary popularity for its product by capitalizing on Ranthambhore.

The very word, Ranthambhore, is very intoxicating, said Prakash Bhandari, one time Bureau Chief at The Times of India.

He floated this product over his email to many with words expressing laughter cum excitement.

The Conservation Times' editors have been sounded by some renowned experts of wildlife to seek answers to this kind of liquor marketing aimed at encashing Ranthambhore Tigers.

Hence some questions are being raised:

*Did this company (Radico Khaitan) seek permission from Government of India, represented in this case by the National Tiger Conservation Authority (NTCA) to use name of Ranthambhore Tiger Reserve to be associated with its liquor brand?

*Is it legal to let a Tiger Reserve be projected to market a liquor brand?

*Has the liquor company any track record of having served for Tiger Conservation, if yes, what did it contribute for this cause?

*Is liquor branding association with a Tiger Reserve permitted as per Government rules?

"POWER TRULY LIES IN HANDS OF PEOPLE"

A COMMUNITY WATER STEWARDSHIP PROGRAMME IN ZANSKAR, THE HIDDEN GEM OF LADAKH IN India

Zanskar villagers attend a talk on sustainable ways of water management, Kirti Chavan

The US based Environmental Education and Conservation Global (EECG) has funded the Snow Leopard Conservancy India Trust (SLC-IT) project on sustainable water management in Zanskar, Ladakh, India. The main objective is to build people's capacity so that they can adopt sustainable water management techniques that better match their needs and the local context.

The article offers easy solutions to increasing crises of water-use or excessive use. – Editors.

Kirti Chavan

Conservationist—Snow Leopard Conservancy India Trust (SLC—IT)

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For the first time in six years, *Yul sum* (meaning cluster of three villages) in central Zanskar lay barren. I have climbed up the adjoining mountain slopes of the *Yul sum* many times during my studies of brown bears in the area. After reaching the elevation of 4200 meters, one gets spectacular views of the central Zanskar plateau sheltered by jagged mountain peaks on all sides. However, in the summer of 2021, this spectacular view was disrupted by many patches of dry barren land. After talking to the villagers, I learned they had decided not to cultivate 70% of their land due to the severe drought.

Water scarcity due to the receding glaciers is a common phenomenon in Zanskar, two villages, Pishu and Kumic have been in news for a few years because they are on the verge of relocation because of water shortages. But now many more villages have started reporting water scarcity due to less snowfall and fast-receding glaciers. The three villages, Khasar, Techa, and Langmi that form the *Yul sum* cluster, and two other villages, Zangla and Tzacar are the five new entrants in this ongoing water crisis in Zanskar.

In the past, the people of Zanskar made permanent settlements at locations where there were abundant freshwater streams that were either fed by snowmelt or glaciers. Traditionally, every village was self-sufficient and mainly engaged in farming and rearing livestock. The members of the village community were assigned important job roles to manage the community resources. One of the jobs was that of a water manager, locally called 'Churpon.' The job of a Churpon was to manage artificial water reservoirs or ponds called 'Zings' and to distribute the water to every household in turn.

In modern times, many of the traditional job roles have ceased to exist as dependence on the government increased. Due to this dependence, many new water management schemes were introduced in Zanskar without considering the local context and need. This resulted in mismanagement and discontent among villagers. In the last two years, one such scheme has

A greenhouse made from recycled plastic bottles, Kirti

attempted to divert all the water directly to the villages without considering its ecological impact on the wider ecosystem and in turn local residents.

The ongoing water diversion project has shown a direct impact on local wildlife like the Himalayan brown bears' behaviour. There has been much evidence of the bears now following the water diversion channels to reach new villages, which then resulted in new incidents of human-bear conflict. Such projects can also have a huge impact on the growth of wild vegetation which is important for the sustenance of livestock, wild ungulates, and bears.

In an attempt to strike a balance between the needs of people and wildlife, Environmental Education and Conservation Global (EECG) funded the Snow Leopard Conservancy India Trust (SLC-IT) project on sustainable water management in Zanskar. The project's main objective is to build people's capacity so that they can adopt sustainable water management techniques that better match their needs and the local context.

The focus was not just on water management or increasing agriculture productivity, but to unite and give voice to the marginalized communities who can learn to work alongside the government bodies in finding solutions to the ongoing climate crisis.

The project's implementation was divided into three stages, the education and awareness stage, the practical exposure stage, and the third phase which involves taking up local action. The first of which entailed people from the five villages attending a training session on the significance of traditional water management practices that were organically sustainable.

One of the invited speakers was Mr. Tsering Tashi, a local elder who has contributed significantly to numerous water canal projects in Zanskar. He claimed that his goal in joining the program was not merely to offer his extensive expertise, but also to attempt to complete what he had previously failed to do. He stated:

"**In the past, working on irrigation projects, I was able to connect water to people, but I was unable to connect people to water**."

He elaborated on how modernization brought conveniences as well as some level of disrespect towards their environment. This, according to him, is one of the reasons why we are slowly being deprived of this valuable resource. His words resonated with the villagers, everyone acknowledged that people have started disrespecting many important natural assets, including water.

The project's second phase narrowed its focus to working with two individuals from each village, who are acting as village advisors. A total of 12 advisors travelled 250 km from their villages to Leh town which is a hub for many innovative ideas for sustainable living. The High Mountain Arid Agriculture Research Institute and the Himalayan Institute of Alternatives, Ladakh (HIAL) are two important centres of innovative research.

HIAL was represented by Mr. Sonam Wangcuk who has won many awards for his ground-breaking work like an ice stupa, a type of artificial glacier to address the water crisis in many parts of Ladakh. One of HIAL's ongoing ambitious projects is to rehabilitate a village called Kullum that was abandoned by people due to water scarcity.

Vegetables thriving in the recycled greenhouse, Kirti

HIAL's team combined traditional and modern ways of water management and was successful in increasing agricultural productivity in the village by using minimal amounts of water. This was an important revelation for village advisors from Zanskar who were exposed to practical alternatives to address water scarcity challenges similar to theirs. ***To experience is to believe.***

The field trip to Leh exposed the advisory group members to water sprinklers and drip irrigation techniques that use 70% less water than traditional flood irrigation techniques. The use of artificial glaciers to replenish groundwater combined with drip irrigation is transforming and reclaiming the village of Kullum. This exposure left a lasting impression on the advisory members and they seemed hopeful for the future.

Apart from water management, ideas on other sustainable ways of farming were presented. Mushroom farming and the setting up of a greenhouse using waste material provided insight into how some are diversifying their farming with a minimum financial investment. Harsh weather conditions make it challenging for farmers in Zanskar to grow vegetables but greenhouses make it possible, which means farmers do not have to buy vegetables shipped from outside Zanskar. The village advisors showed keen interest in the various options for constructing greenhouses using discarded plastic bottles and vehicle tires.

The third and most important phase of the project is about liaising the advisors and community members with government bodies that play a key role in providing financial assistance to implement development work in the villages. SLC-IT facilitated a meeting between the community members and government officials to discuss the villages water scarcity problem.

The first meeting paved the way for future dialogue between stakeholders and government bodies to find solutions to the ongoing climate crisis. In the coming months, the five villages are expected to develop a water management plan and present it to the government bodies in the form of a proposal. This will be done with the expectation that it will provide:

1.Local communities with a voice in the planning and implementation of development work in Zanskar, and

2.Demonstrate a practical approach for how communities and government bodies can work together to ensure development activities address community needs while using technologies and approaches that fit the local context and environment.

SLC-IT believes that community stewardship is important for the long-term sustainability of conservation action. The impact of many projects can be short-lived because they are often dependent on the donor money that is often time-bound. However, if the local community is motivated, engaged, and take ownership there is a greater possibility that their efforts will continue beyond the project life-cycle.

A village elder from Zangla village, Mr. Lobzang Tsering, said that by participating in this project he gained new knowledge and an appreciation for the value of respecting nature. He said he now believes that power truly lies in the hands of people and how they use this power will determine the future of Zanskar.

ELEPHANTS DAMAGE CROPS AND HOUSES BECAUSE OF DROUGHT

By David Leonard Kabambo
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The climate change crisis in Africa is expected to affect both people and wildlife. Drought is a regular occurrence, and droughts are expected to become more frequently in most arid and semi-arid ecosystems in Tanzania. Vice president of Tanzania, the Honorable Philip Mpango, outlined measures the government is taking to address climate change. According to him, Tanzania has been implementing an extensive tree planting programme in which each district had a target of planting 1.5 million trees annually. In 2021, over one hundred million trees were planted country wide, he said. Source The Citizen Newspaper, Friday December 09, 2022.

Water shortage, habitat destruction, and inadequate elephant forage which is caused by drought translate into disaster for elephants. Elephant need water to drink, hence are vulnerable to drought. They usually need to drink up to two hundred liters of water per day. During a drought period elephants tend to migrate from a park to communities in search of available water and food. Villagers' maize farms are invaded by elephants searching for something to eat. Also, houses are destroyed by elephants searching for something to eat.

In Makame Ward, during a peak of drought in November 2021, the drought triggered a scrabble for drinking water between the Makame ward residents and elephants.

Local people say human elephant conflict increased between September 2021 and January 2022. At that time, residents were forced to share scarce water from ponds with elephants.

The African Elephant

Severe drought dried out ponds and led to a scarcity of grasses for elephant grazing. Noah Sitati, wildlife species expert from World Wildlife Fund (WWF) in Arusha –Tanzania, says the loss of grass poses additional risk to wildlife including elephants.

Drought can also mean that young elephants die or do not develop properly because their parched mothers produce less milk. Research shows that elephants migrate seasonally depending on the availability of water.

According to Dr. Maurus Msuha, Director of Wildlife Unit in the Ministry of Natural Resources and Tourism, says that the Tanzania National Parks Authority (TANAPA) and the Tanzania Wildlife Management Authority (TAWA) are taking steps to counter drought.

TANAPA's conservation commissioner, Mr. William Mwakilema, acknowledges that drought has disturbed elephants in some National Parks and Wildlife Management Areas through 2021.Plans to build dams and drill wells have been in place for some years. Source IPP news 19 March 2022.

According to Tanzania Meteorological Authority in a report released on 3 March, there has not been such a severe drought for 20 years. Through 2022, temperatures were 0.5 degrees Celsius above the long-term average recorded between 1981 and 2020. Tanzania National Climate Change Strategy 2021-2026 proposes to mitigate climate change with cross-cutting interventions such as using technology development to reduce forest degradation.

Elephants in Tanzania have economic value through wildlife based natural tourism. Tourists from around the world visit Tanzania, to see wildlife including elephants. Tanzania tourism sector generated USD 1.4 billion in revenue in 2021, verses USD 1 billion in 2020,when it was severely affected by Covid-19 pandemic and its impact on international travel and in 2019 it generated 2.6 billion.

Source: Tanzania tourism investment Tanzania Tourism Sector - February 2023.

SPRING REMINDER FOR BETTER LIFE

By Manoj Sharma
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Tulip garden in Srinagar, Google

Manoj Sharma worked for the Indian Statistical Service for 10 years and then immigrated to the USA to pursue graduate studies in statistics. Currently he is the Director of Biostatistics at Grail Inc., supporting the company vision of "Detect cancer early, when it can be cured".

Spring is the season when nature changes its course. Succeeding winter and preceding summer, this season creates new beginnings, when dormant plants start to bloom again. People start outdoor activities and spend time in nature.

In the northern hemisphere the season begins on March 21. This day is also referred as Spring (vernal) equinox, when day and night are of equal duration. Almost all world regions and religions celebrate this period with several festivals (Easter, Ayyam-i-Ha, Purim, and Holi), fasting (Lent, Ramadan, and Navratri), new year (Naw Ruz and Gudi Padwa).

Naw Ruz meaning "the new day" symbolizes hopes for the New Year and is celebrated by Persians worldwide. GudiPadwa is the beginning of New Year for Hindus and is celebrated as the first day of the Shukla Paksha of Chitra month. The year refers to Vikram Samvat (57 years ahead of Gregorian calendar), and is used by Hindus, Sikhs, and Pashtuns. The ninth day of Navratri is celebrated as Lord Rama's birthday. Lord Rama was born in Ayodhya, India on the ninth day of Shukla Paksha of Chaitra month.

There has been a movement in India for re-building Ram temple in Ayodhya. There are a lot of interpretations on different couplets narrated by Saint Tulsidasa in the Hindu scripture of Ram Charita Manas. Indian masses living in India as well as Indians living abroad have equal enthusiasm for this revival of faith in Lord Rama, symbolized by the temple building movement.

People paying so much faith appear forgetting the life story of Rama. He had spent 14 years exile in forest giving up the kingship. When we worship someone, we have to look at the entire life story rather than just focusing on the birth or the beginning. Lord Rama was instrumental in preserving human values by destroying the demonic values through out his life. His living and moving into the forests with his wife and brother for 14 years is an example to emulate for co-existence with nature and preserving human values.

Following the model of co-existence with nature and preserving good human values is the right dharma as depicted by Lord Rama. Demonic values are symbolized by negativity, hunger for power, and greed for accumulation as exemplified by several characters in his life story. Looking at one aspect and focusing on a life-segment breeds fundamentalism and movement but doesn't serve the purpose of human life.

We also mistakenly think progeny as purpose of human life but even that cannot be fulfilled for future generations if we lose to see the big picture of interdependence with nature. We are already noticing worldwide climate change, droughts, floods, and natural calamities, which could also be interpreted as demonic results of our not paying attention to the full life's view.

We often make mistakes in our life and later repent with guilt when guided by strong emotions and one-sided point of view and forget the truth of life as a continuous cycle of birth and death.

As Spring is the new beginning, could we commit to make a new beginning for our life by simply understanding this fundamental point of view of interdependence with nature and spending some effort (time, resource) for its preservation for our future generations. Preservation of nature also requires that we be conscious of ecological balance that is created by the major elements of forest, e.g., unpolluted rivers, trees, predators, and preys.

WILL DROUGHT BE A DETRIMENT TO POLLINATORS?

By Binita Pandey
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Honeycomb, not observed easily now a days, Harsh Vardhan

Globally, pollinators are reported to be impacted by climate change. Plant physiology and distribution are altered due to the impact of climate change. Besides these changes, climate change is likely to have a variety of effects on pollinators such as range shifts and spatial or phenological mismatches in plant-pollinator interactions. Recent studies show that drought and rising temperatures because of climate change are common stressors affecting plant growth and development.

Drought in particular has been identified as a major threat to pollinators and pollination. It will primarily affect the availability of floral resources on which pollinators rely. In general, a decrease in water availability reduces photosynthetic rate, resulting in fewer resources available to plants for investment in reproduction and flowers. As a result of drought, there could be another impact on pollinators as the quality or quantity of floral resources will be reduced. Drought has been shown to reduce flower size, the number of flowers per plant, result in flowers that produce less pollen, and a lower proportion of viable pollen grains and affect floral volatiles, which can influence the attractiveness of flowers to pollinators. Changes are also observed in terms of morphology and/or attractiveness between plants and pollinators, causing potential morphological and recognition mismatches.

In most countries, drought in the spring and summer may be harmful to plant-pollinator systems as these are critical times for the growth and reproduction of both flowering plants and their pollinators. New research shows more frequent droughts could cause plants to produce fewer flowers. Drought (periods of abnormal precipitation deficit) is expected to become more common and intense in many parts of the world as a result of climate change.

In a country like Nepal, the impact of climate change would be obvious. Nepal, which is in the heart of a climate change "hotspot" (Stocker et al. 2013), has long been acknowledged as one of the most climate-vulnerable countries, ranking 9th in the world on the Long-term Climate Risk Index from 1999 to 2018 (Sönke et al. 2015).

Since 2005, drought has been reported continuously in Nepal which could be an impact of climate change.

However, the impact of drought on pollinators are not studied yet in Nepal but bees being primary pollinators in Nepal's highland regions, there is a significant risk to bees declination.

TEACHERS' AND YOUTH LEADERS' CORNER

By Kirti Chavan
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The project on Sustainable water management in Zanskar funded by Environmental Education and Conservation Global (EECG) and implemented by the Snow Leopard Conservancy India Trust (SLC-IT) tackled many sensitive issues, one of which was to make communities understand the concept of overharvesting of natural resources and how it impacts every stakeholder involved.

To tackle a complicated topic such as overharvesting, game-based activity on the concept of the tragedy of the commons was devised.

The tragedy of the commons is a concept in economics that describes a situation where individuals, acting in their own self-interest, deplete or degrade a shared resource that they all depend on.

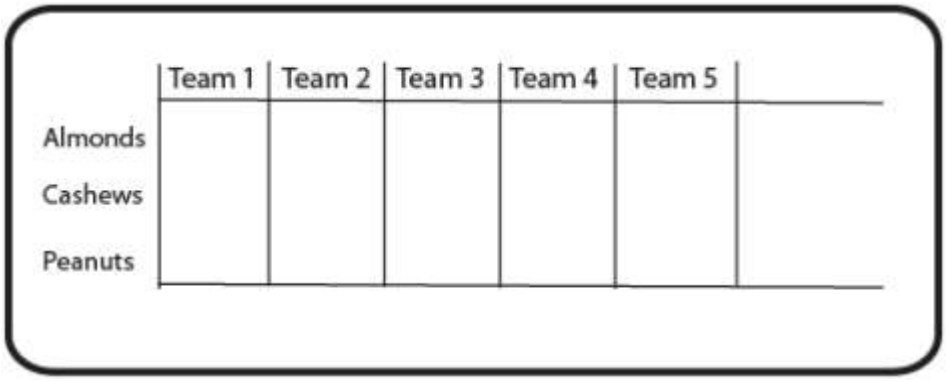
This happens because each person feels entitled to use as much of the resource as they want, without considering the impact of their actions on others.

As a result, the resource becomes overused and eventually depleted or destroyed. The tragedy of the commons highlights the conflict between individual interests and the common good, and the need for collective action and management of shared resources like water.

In the game, 5 teams were formed comprising 2 participants, two from each of the project villages.

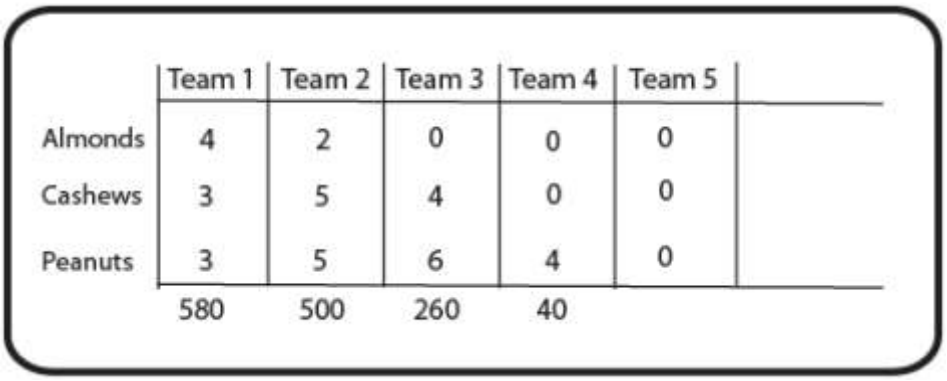
The teams were presented with a plate full of three types of nuts, six almonds, twelve cashews, and eighteen peanuts. Almonds were less in number but were assigned 100 points, cashews were assigned 50, and peanuts were assigned only 10 points.

To track the score, a whiteboard was used to display the score each team would score during the game.



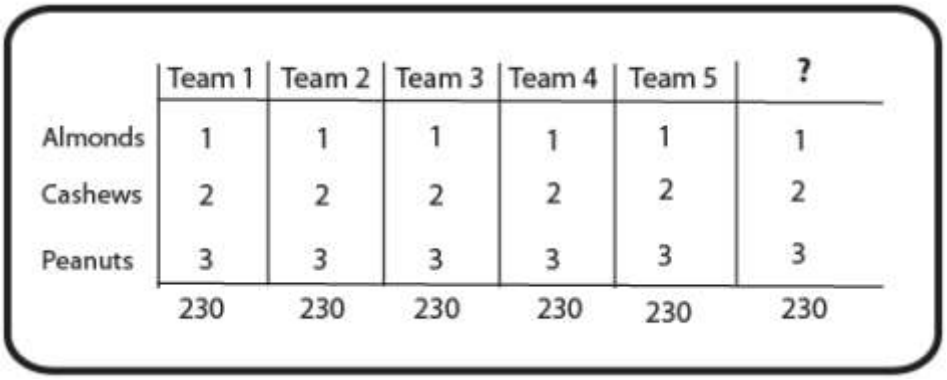
	Team 1	Team 2	Team 3	Team 4	Team 5	
Almonds						
Cashews						
Peanuts						

The first team was asked to pick any amount of nuts with a spoon in 30 seconds, after which the next team gets to do the same, and so on and so forth. By the time the third team finished their turn, it was evident that the remaining two teams had no chance of winning the game as the nuts with higher value got picked up by the first two or three teams, and the scoreboard looked as follows:



	Team 1	Team 2	Team 3	Team 4	Team 5	
Almonds	4	2	0	0	0	
Cashews	3	5	4	0	0	
Peanuts	3	5	6	4	0	
	580	500	260	40		

The moderator of the game opens up a discussion by asking, does this game gives a fair chance for everyone to win? The message of the game was intuitively understood by all the participants and the discussion elaborated on the idea of equity in justice in resource sharing. The moderator rearranges the scores on the whiteboard depicting a scenario, if teams were mindful and had equally distributed the resources, then the scores would look as follows:



	Team 1	Team 2	Team 3	Team 4	Team 5	?
Almonds	1	1	1	1	1	1
Cashews	2	2	2	2	2	2
Peanuts	3	3	3	3	3	3
	230	230	230	230	230	230

The rearranged scores, as expected, puzzled the participants because the resources appear to be distributed in six parts as opposed to five. The moderator explained the importance of keeping an extra share for nature, to ensure regeneration, and revival, without which we will end up on a resource-depleted planet.

A WORLD RECORD FOR THIS BIRD

By Editors of CTimes

(left) YD Singh with Great Indian Bustard at Jodhpur Zoo, Harsh Vardhan, (right) A male Great Indian Bustard in display, Radheyshyam Pemani Bishnoi

The BirdLife International (BLI), a renowned non government organization based at Cambridge, Britain, contented that Great Indian Bustard (*Ardeotis nigriceps*) will not be able to breed in captive conditions. Its expert expressed such views at a meeting in New Delhi some years ago organized by the Ministry of Environment Forest and Climate Change (MoEFCC).

It was then the proposal for ex situ breeding of the species was taken up at Ministry level again. The matter was being discussed for several decades with no decision being arrived at. Because forest authorities were shy to capture birds in wild as the global population was stated to be only about 130. Maximum were in Jaisalmer region of Rajasthan, India.

In 2019, Arindam Tomar, Chief Wildlife Warden of Rajasthan, took the unprecedented decision to consent for ex situ breeding. In came Wildlife Institute of India and invited support from Abu Dhabi based International Fund for Houbara Conservation. Eggs were collected from wild and hatched at a hatchery created at Desert National Park.

By 2023 summer, 23 chicks of Great Indian Bustard are in safe condition roaming around the hatchery. The first adult pair performed courtship and laid an egg. A chick was born. It is next generation bird and considered to be a world record for the species. Such chicks born there will be released in wild to restock population of the species described by IUCN as critically endangered.

The experiment is being administered by Dr. Suthirtho Datta, a scientist from Wildlife Institute of India, assisted by an experienced veterinarian, Dr. Shravan Singh Rathore.

The Institute's Dean, Dr. Y.V. Jhala has been singularly responsible for conceptualizing and introducing such an ex situ breeding enterprise for the species. Jhala was leader of the Indian team for importing Namibian Cheetahs to India's Kuno National Park during September 2022. The project was supported by Lauri Marker, founder of Cheetah Conservation Fund.

Jhala retired from the Wildlife Institute of India recently. He is in process of launching a new initiative.

The GIB project is administered by forest department of Rajasthan. It is funded by MoEFCC. An appropriately planned hatchery has been developed at Ramdevra habitat, about 90 km away from Desert National Park in Jaisalmer. It is to serve as state of art facility for the birds in question. The bird's presence at this habitat is impressive.

However, pariah dogs' number has increased and are a menace to eggs laid in wild. Semi wild boars add to the problem. Their rescue and release far away has been initiated and success is visible. The species requires uncommon efforts to be conserved. That is what, at long last, started happening. Tourism & Wildlife Society of India (TWSI) had initiated conservation initiatives for this species in 1980 amply supported by US Fish & Wildlife Service.

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