Wildlife conservation efforts: Sanjay Gubbi wins Whitley Award 2017

Sanjay Gubbi is a wildlife biologist and conservationist who mainly works on conservation issues in Karnataka, India. His interests lie in large conservation biology conservation policy, human–wildlife interactions and outreach. Sanjay hails from Tumkur district in Karnataka. He graduated with a Bachelor's degree in engineering. Later he took up conservation as a full-time career and obtained a Master's degree in Conservation Biology from the University of Kent, UK in 2006. His Master's dissertation won two major international awards. He was also the recipient of the Maurice Swingland Award for the best postgraduate student of the year. He is the recipient of Carl Zeiss Wildlife Conservation Award for 2011. In May 2017, Sanjay won the prestigious Whitley Award, popularly known as the Green Oscars, for his efforts in tiger conservation. The awards are instituted by the UK-registered charity Whitley Fund for Nature, which supports nature conservationists in their efforts to conserve wildlife and nature. He won the award for his work to protect tiger corridors, reducing fragmentation threats and conservation outreach in Karnataka.

Sanjay has worked on key panels of Karnataka, including the State Board for Wildlife. His recent work on the Western Ghats of Karnataka has strived to reduce the impact of habitat fragmentation. He has also been collaborating with the Karnataka Forest Department towards an expansion of protected areas.

Pioneering work carried out by Sanjay in the field of protected area expansion, human–animal conflict, conservation of wildlife, and its governance is briefly described here, drawn from the excerpts of the work carried out by him and his colleagues in these areas in Karnataka.

Human–wildlife conflict and work carried out in the area

Karnataka is rich and diverse in its flora and fauna. The recorded forest area of Karnataka is 43,356.47 sq. km, according to the State's Forest Department annual report for the year 2014–15. With regard to the geographical area of Karnataka, unprotected forests constitute 16%, protected forest areas constitute 3% with 5 national parks and 29 wildlife sanctuaries, 12 conservation reserves and 1 community reserve[1]. The Western Ghats is a biodiversity hot spot in the country. Animals such as tiger, elephant, lion-tailed macaque, dhole, sloth bear, leopard and gaur are found here. Such fauna are being threatened due to poaching, human–wildlife conflict, habitat destruction and pollution.

Human–wildlife conflict poses a critical threat to the survival of endangered species such as elephant, tiger, lion-tailed macaque, etc. This conflict is an obstacle to wildlife conservation which not only threatens the lives of humans and animals, but also hampers long-term biodiversity conservation goals.

The following are some of the issues, causes and direct/indirect consequences of human–wildlife conflict[1].

Issues in human–wildlife conflict cause damage to crops, livestock, humans, road kills, poaching and transmission of diseases or disease-causing parasites.

Causes of human–wildlife conflict include increased fragmentation of protected areas owing to gradual loss of wildlife habitat; transformation of wildlife habitats for agriculture, tourism and animal husbandry; natural factors such as droughts, man-made fires, climatic conditions and other natural hazards that impact wildlife habitat and seasonal modification of habitats due to rainfall.

Direct and indirect consequences of human–wildlife conflict are chance encounters with wildlife along paths between dwellings and a water source in the forest, and also with wild animals that stray out of the natural boundaries in search of food. This results in injuries/death of people, loss of domestic cattle affecting the wealth and livelihood of families. A common reaction of human–wildlife conflict is the killing of wild animals by people as retaliation.

Transmission of diseases from domestic animals to wildlife and vice versa, competition over grazing land, habitat fragmentation and pollution that pose a threat to the survival of wildlife population are some of the indirect consequences of this conflict. Improvement in the habitat, training and awareness programmes, technical and financial support, boundary walls and eco-development activities are some of the measures that can be taken to reduce this conflict.

Wildlife–vehicle conflict

Sanjay's work highlighting human–wildlife conflict includes the impacts of roads and highways on movement of animals such as elephants, leopards and tigers[2–4]. Gubbi et al.[2] draw our attention to the fact that over the past decade, expansion and improvement in transport and other infrastructure networks have contributed to India's economic growth. The authors state that though there are legal mandates that require assessment of ecological impacts of infrastructure projects prior to implementation, no proper assessment of the post-implementation ecological impact is currently being done. In an attempt to assess wildlife–vehicle conflict owing to the construction of roads, remotely triggered camera traps were placed on two sections of the highway passing through Nagarahole tiger reserve in Karnataka – one section was closed to vehicular traffic and the other was open to traffic during the daytime. Low rates of sighting of chital, gaur and elephant were recorded in camera traps where the traffic density was high. This suggests that these animals avoid busy highways. Gubbi[3] has highlighted the mortality of leopards due to vehicle-induced accidents. According to him[3], in 5 years (2010–2014), 23 leopards were killed due to road accidents in Karnataka. Another article, a case study[4], draws attention to tigers. As with other mammals, tigers are also threatened by road traffic. The case study highlights that though the mortality of tigers due to wildlife–vehicle collisions in India is recorded at 20 deaths over the past 15 years, this is most likely an underestimate, due to some deaths not being detected and reported.

Management of wildlife–vehicle conflict

In an attempt to show how the risk of wildlife–vehicle conflict can be managed and mitigated, Gubbi et al.[4] have reported a case study of the Nagarahole and Bandipur conservation reserves, that house over 100 breeding tigers. The authors draw our attention to the fact that there are seven major roads passing

through the two contiguous reserves. In the year 2008, the government closed the 27.3 km stretch of the Mysore–Mananthavadi Road (SH-17) that passed through the southern part of Nagarahole reserve between 18:00 and 06:00 h. An alternative route was identified. This reduced the length of the road within the tiger reserve to 17.3 km and provided better access to 11 poorly connected villages. The realignment of the roads outside the reserve reduced the impact of traffic. Owing to poor condition of the alternate route, in 2012 the government released US$ 3.2 m for its repair after it was convinced of the conservation and public welfare merits.

In 2010, following the example of the Mysore–Mananthavadi road, the Karnataka Government closed two highways (NH-67 and NH-212) passing through the Bandipur tiger reserve between 21:00 and 06:00 h. An alternate road that was less damaging passed along the boundary of Nagarahole (SH-90). As in the case of the Mysore–Mananthavadi road, this was in a poor condition too. The government allocated US$ 8.03 m for repair works.

Gubbi et al.[4] cite the following future course of action for reducing wildlife–vehicle conflict:

1. Prevention of construction of new roads in protected forest areas followed by rerouting through the core area of a reserve.
2. Engagement of different levels of the government and community to mitigate road impacts.
3. The need for a dedicated wildlife-crossing structure instead of the current standard drainage.
4. Funding agencies which fund construction of roads should also get involved and ensure that the new developments do not endanger wildlife in the area of construction.

Led by these examples, other state governments implemented night closure of roads in protected forests and developed diversion roads. These include the Mudumalai tiger reserve in Tamil Nadu, and Gir National Park and Velavadar Wildlife Sanctuary in Gujarat.

Defragmentation of habitat to establish tiger corridors

With regard to tiger corridors, Gubbi et al.[5] have highlighted the following: Several effective strategies have been implemented by the Karnataka Government to conserve tigers. However, the protected areas that shelter these tigers were disjointed and isolated. This resulted in increased fragmentation of the tiger population in these areas. The authors state that habitat connectivity between populations will enable genetic exchange between them and help maintain the same. In response to this, in collaboration with civil societies, the Government of Karnataka started to link the tiger populations by identifying ecologically important habitats and designating them as protected areas to ensure long-term habitat protection. The government set up the 906 sq. km Malai Mahadeshwara Wildlife Sanctuary resulting in contiguous network of protected areas. Over 19 months new areas were added to the network of protected areas that host and connect a population of nearly 300 tigers. Such measures delivered dual benefits of wildlife conservation and protection of watersheds. Using a conservation planning technique that considered ecological, social and political factors[6], the approach resulted in the expansion of the protected area network by 2385 sq. km, connected 23 protected areas and the created three complexes of protected areas, thus increasing the protected area network in Karnataka from 3.8% to 5.2%. Such partnership between stakeholders highlights the importance of complementary roles in conservation planning and implementation.

Welfare measures for forest watchers and guards

Sanjay[7] talks about the forest watchers and guards as the unsung heroes of wildlife conservation. They are the first line of defence against wildlife poaching, forest fires, timber smugglers and other activities that degrade wildlife habitats. The forest guards face risks from Maoists, terrorists, and also have to face the wrath of local farmers who suffer from human–wildlife conflict. To add, many of these frontline staff are old and cannot take harsh duties which the job demands.

These guards lack basic amenities such as drinking water, and have to face hardships such as night duty, 365-day duty and lack of proper mobile-phone networks. Besides, temporary staff are always at the mercy of the local officer with a salary that is neither fixed nor assured. They are not eligible for leave and are always in the fear of losing their jobs. Many do not even own two decent pairs of uniforms, which could act as an important deterrent against poachers and smugglers.

Sanjay has helped institute new social security and welfare measures for forest watchers and guards to offset the additional cost of maintaining families at distant places. A new policy that provides hardship allowance from Rs 2000 to Rs 3500 per month was instituted in Karnataka for the frontline staff of protected areas due to his efforts. Karnataka has implemented a policy to provide insurance even for temporary staff working in protected areas, and give one lakh rupees to any temporary watcher who has put in substantial years of service at the time of retirement in any of its tiger reserves. The funding for this is from the respective tiger foundation.

Wildlife governance

He states that conservation of wildlife does not depend on science alone but is also dependent on the quality of governance and wider social setting[8]. 'While effective administrative intervention has often helped in species and ecosystem recovery in India, inept government efforts have accelerated or degraded the habitats with adverse impact to wildlife.'

The author discusses the earlier model of wildlife conservation and how this started to change from the 1990s. The increase in protected areas to 723 over a period of 20 years (1970–1990) was owing to a political leadership that was sympathetic towards conservation of wildlife. He states that this model is now challenged externally and internally; externally owing to economic growth and internally owing to drift of the mission away from protection towards eco-development, system inefficiencies such as lack of welfare measures for department staff and corruption in the Forest Department.

With the country's economy growing at about 7–9%, industrialization and increasing number of development projects pose a threat to wildlife. Sanjay cites that there has been a weakening of the forest conservation laws on account of economic growth, e.g., infrastructure projects

implemented by government agencies receive softer scrutiny when implemented in ecologically sensitive areas. Also, the political parties ruling the state and centre/coalition governments can have divergent philosophies with respect to conservation.

The earlier model of wildlife conservation relied on beat patrol system, intelligence gathering and efficient prosecution handling. With a boom in the tourism industry, protected area managers have now shifted their focus towards eco-development and habitat improvement. Funding from multilateral aid agencies towards eco-development of protected areas has also increased. He states that the direct effects and by-products of such increased funding need careful scrutiny[9].

He cites that in the present scenario, there is a lack of social tolerance as well. Even crop-raiding wildlife (elephants) was revered previously. In the current scenario, the number of elephants killed by farmers who retaliate against crop raid has increased from 8 to 28 in just 3 years.

Takeaways for successful wildlife governance

Successful wildlife governance particularly needs constant interest and support of political groups. Sanjay cites some of the following measures that can be adopted for successful governance:

'Developing a network of political constituencies at all levels and fostering it through informed outreach will provide a great boost for conservation. Civil society, conservation biologists, activists and supporters of wildlife must prioritize their list of strategies and constantly engage with the power houses for effective results.

'Protected area budgets should be used towards mitigating staff problems at lower levels, enhancing field protection, motivating field staff and other similar activities. Corruption needs to be curtailed for effective management.

'Conservation management can be made more accountable through independent auditing and there is a strong need to develop meaningful indicators to measure success. One such measure would be the ability of managers to work towards ecological needs of wildlife.'

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S. Priya (*S. Ramaseshan Fellow*), Current Science Association, Bengaluru 560 080, India.
e-mail: priya@ias.ac.in

MEETING REPORT

Innovation and science*

The dialogue on innovation and sciences revolves around general questions common to both exact and human sciences such as choices and constraints, stability and changes, perception and realities. Is innovation to science what fashion is to textile industry? A compulsion to always propose new products in order to maintain the consumer in a constant state of expectations and to ensure sales? If we cannot but underline the ambiguous rela-

tionship between innovation, science and technology in the context of the financial and economic competition, we cannot ignore the real creativity of the technological world. Moreover, is not change just an inherent feature of both human nature and culture as well as of the world at large?

The lectures delivered under an Indo-French Innovation Workshop held at the National Institute of Advanced Studies (NIAS), Bengaluru focused on how recent technological innovations may bring challenging perspectives for notions which are central to modernity, such as object/subject or reality. If change is accepted as an inherent feature in any life process, how do we position ourselves in this perspective and how can innovations enhance a better understanding of the world with humans, not the passive receiving end of technological apparels driven by financial private interests, but as an active stakeholder at every level?

Are there non-destructive modes of explorations, and can technologies remediate the global challenges we are confronted to? What can be the role of scientists, institutions and companies in that context? How can scientific cooperation between India and France contribute to finding answers to those questions?

NIAS was founded by JRD Tata, an eminent Indian personality born as a French citizen, the country where he grew up and was educated. The very life of Tata, a pilot trained with Louis Bleriot, who became one of the world's leading entrepreneurs and founded some of the best scientific institutions in India, is itself a remarkable case of multidisciplinarity and of a long and very high standard of scientific dialogue with France. Efforts in that direction were initiated more than a century ago by various individuals and organizations, and carried forward since India's independence at a bilateral level. NIAS was thus a