Editorial

Conservation Drones: A new tool for conservation action

Collecting good and timely field data is important for proper conservation initiatives. Lack of data is often given as an excuse by decision makers for not taking conservation action. Scientists and conservationists use various methods to collect field information, mostly with limited resources, both human and financial. With increasing restrictions on research permission, particularly for invasive research, it becomes extremely difficult to collect good information that can be used to convince decision makers such as forest officials. National parks and tiger reserves, where some semblance of natural habitat survives, are becoming out of bounds for ground research.

There appears to be great resistance to the use of new technology in wildlife research by the government. For example, satellite tracking of animals was pioneered in the USA in the early 1970s and became popular for bird migration studies from the early 1990s; the Ministry of Environment and Forests (MoEF), however, resisted the use of satellite tracking for many decades, for security reasons, until they allowed it on an 'experimental basis' in 2001. Similarly, their initial reaction to freely available Google maps was to block them for security reasons. Fortunately, technology bulldozed this ill-conceived opposition and now the Government of India is one of the biggest users of satellite maps, employing them to study various aspects from the forest cover to urban planning.

A new technology of using unmanned drones for conservation purposes is on the anvil. Unmanned Aerial Vehicles (UAV) or Conservation Drones is still in the experimental stage but I foresee a huge potential, from catching poachers to surveying difficult terrain for conservation planning. Drones have also shown tremendous scope to study vehicular traffic, crowd control, and disaster management. There is a website www.ConservationDrones.org whose mission is "to share our knowledge for building low-cost Conservation Drones to help conservation workers and researchers in developing countries do their jobs a lot more effectively and cost efficiently."

Due to misuse by the military, the very idea of drones sends a negative feeling among the public. However, Lian Pin Koh, Assistant Professor of Applied Ecology and Conservation, Swiss Federal Institute of Technology, Zurich, and Serge Wich, Professor at the Research Center in Evolutionary Anthropology and Paleoecology at Liverpool John Moores University, showed that drone technology, based on hobby aircraft models, can be used for conservation purposes. The technology was first used in the Sumatra Rainforest to photograph Orangutan nests on tall trees, which were difficult to identify from the ground. The Conservation Drone, fitted with camera and GPS came up with numerous pictures of nests which gave data on the number of Orangutan surviving in the area. During 30 flights, it collected hundreds of photographs and hours of video footage. It also showed the devastation of the rain forest due to oil palm plantation and illegal logging. Since the successful experiment in Sumatra, conservation drones have been used in Malaysia, and some countries in Africa.

In South Asia, Nepal was the first country to experiment with conservation drones. In June 2012, a conservation drone was successfully flown in Chitwan National Park, under the famous Terai Arc Landscape Programme of WWF-Nepal. The aim is to deploy these drones to check the movements of poachers and encroachers. Once a poacher gang is located, the ground staff can reach quickly as the drone transmits the GPS location. A successful test flight undertaken in Kaziranga NP shows that Conservation Drones could be a potentially useful tool in the fight against rhino poachers.

A Conservation Drone can be pre-programmed to travel particular routes and take aerial pictures and video footage. This will be of use to gather geospatial data of inaccessible areas. It can also be used for Citizen Science programmes, involving amateurs to analyze the high-resolution data (images/videos) collected by the Conservation Drone. These high-resolution images can provide information about the condition of forests and changes, if any, taking place due to fire, encroachment, invasive species, or a natural calamity. Conservation Drones will be particularly useful to monitor encroachment as they can provide monthly or even weekly data (depending on how frequently they are flown). Timely ground action based on high resolution images can prevent further damage.

My particular interest is to use camera-fitted Conservation Drones to fly over grasslands to locate Bengal Florican. The Bengal Florican *Houbaropsis bengalensis* lives in medium to tall wet grasslands of India and Nepal terai, and the Brahmaputra flood plains. These grasslands are also inhabited by Tiger, Rhino, Elephant, and Wild Buffalo, so ground surveys are not always possible. The bird is seen either just after burning of the grassland when the grass is very short, or when it displays by jumping above the grasslands. I will be interested to experiment if a Conservation Drone can be used to locate Bengal Florican. If this is possible, it will help to survey the large number of grasslands on river islands (*chaporis*) of the Brahmaputra river that come up every year just after the monsoon floods, which are otherwise difficult and/or time consuming to approach. Once Bengal Floricans are located, ground truthing can be done wherever possible. Similar studies can be done on other animals such as Rhino, Elephant, Swamp Deer, Wild Buffalo, and to keep an eye on poachers and encroachers.

As this technology is still in the experimental stages for conservation purposes, it will be good if India takes a lead. A mature approach would be for the government to set up a policy and rules governing the use of drones for civilian and research purposes, so that India leads the way in promoting this nascent technology for the benefit of conservation. But, will the jittery mandarins in the corridors of power in Delhi allow this, or will Indian field conservationists have to wait for a couple of decades for this technology to overcome all the difficulties? This is the big question.

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(With inputs by Dr. Christy Williams)