'Language and Technique' for popular wildlife science

(*Extracts from a first person account of life and experience*)

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Simple tools and easy interpretations can help a lot for popularizing science, particularly when it is in the kind that is off the main academics. Here are a few experiences, innovations and lessons under Crocodile Conservation Scheme and Project Tiger which are two nation-wide projects for scientific management of wildlife resource.

Field practices in these projects have largely been successful as the science of Wildlife Conservation has been explained and implemented with appropriate range of field-languages and techniques suitable for various levels. It has been done with (a) the staffs at the grass root level who strive to translate theoretical recommendations into field actions, (b) the local people who understand just the simple ways of the nature that has nurtured their character to use and protect the resources for generations, and (c) the students who wish that the Wildlife Science steers them through a meaningful career (d) The remaining public at large and the media are reached with the entire package of approaches.

Wildlife Management prescriptions are strongly directed and improved from experience and lessons learnt in the field. At least three other components which keep changing and interacting on each other also determine the course of management activities. These components are the (a) ecological factors influencing the habitat of wildlife species, (b) the changing or adaptive behaviour of wildlife species, and (c) eco-friendly accommodation of the demand and expectations of various anthropogenic elements. All these components have shaped the growth of the science of wildlife management.

Of late I fear, to a certain extent 'Wildlife Management Practices' is digressing away from the realities of requirements in the field. Instead of laying emphasis on indigenous innovations Wildlife Studies and Management are getting studded with experiments and recommendations applicable to wildlife from very different biomes in other parts of the globe. As a result, perhaps the Wildlife Science is heading to become an abstract science that is not a true refection of Indian natural history or wildlife biology. There is an increasing trend for applying techniques that appear to overshadow the management of 'wild living beings'. Modern gadgets and statistical extrapolations should be used for improving interpretations and not as a matter of convenience to replace field rigours. It is misleading and dangerous to get satisfied with answers to everything out of very little field data.

One of the many reasons for this trend is rooted to a kind of infatuation reflected through dependency and over-use of virtual mathematical models. Computers and remote sensors are able to provide choice for studies without hazardous field camping. Another reason is the administrative and financial ease for experimenting in the field such costly products which are results out of scientific and industrial growth in the electronic sectors. These are fine as supplements that are short-lived enthusiasm for adding luster. These shouldn't sacrifice the most established and familiar basics in natural history and wildlife biology.

A popular subject easily elicits public cooperation

In 1952 the 'Central Board for Wildlife' was constituted as conservation of wildlife is an important, popular and widely advocated subject of importance for human survival. Later, the Board was renamed as the Indian Board for Wildlife (IBWL) and now it is the National Board for Wildlife (NBWL), with parallel Boards at the State level. The members of the Board are drawn from a wide range of public and professional profile. These members need to be told in simple terms what is all happening in the wildlife sector.

In accordance with recommendations of the Board we have celebration of the Wildlife Week, coinciding with the birthday of Mahatma Gandhi. At this time there are publicity through lectures, print and electronic media, film shows, guided nature tours, and essay competitions in schools and colleges. Other activities that popularise and educate different target groups about the Wildlife Science are 'nature clubs' in educational institutions, and the subject of environmental conservation in the syllabus adopted by the NCERT (National Council of Education Research and Training). The University Grants Commission (UGC) recommended for setting up of faculties on wildlife education in selected universities but the curriculum appears to have only a few takers. The North Orissa University runs a self-financing M.Sc., course in Wildlife Conservation and Management.

School students are the most receptive to conservation message

During 1994-1997 we started to conduct a number of 3-days long nature camps in Similipal Tiger Reserve. There were different participant groups,--- the undergraduate students, college faculties, members from the civil society with various professional profiles, and the school students. The purpose was to give a type of once-in-lifetime exposure in the forest, and demonstrate the various wildlife conservation tools and techniques including studying of tracks and signs. The significant lesson for the management was that the High School children constituted the best target group as these were receptive as well as meaningfully responsive.

The language of interaction and the curriculum of a nature camp were very carefully drawn up. Every part of their time during trekking or discussion gave the participants guided orientation and information. The forest guards, foresters, range officers and watchers were very enthusiastic during those days when they could share their life and experience in the forest with wildlife. The language for communication of the art and science of wildlife conservation was simple, interesting and adventurous for the staff and their audience. I have seen, some of the children (students) becoming emotional before the staff when it was time for departure from the forest.

Successful conservation and research go hand-in-hand

'Successful conservation and research go hand in hand'. That was the dictum of approach in crocodile conservation programme launched in 1974-75, and it showed the approach for other wildlife conservation projects. There were two main conservation projects in India during 1970s and 1980s. The approach for handling research was different in the beginning. Fresh pass outs from Universities were selected for crocodile conservation work. But in Tiger Reserves the Field Directors handled research initially. Later, Research Officers worked under concerned Protected Area managers or the Chief Wildlife Wardens.

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The scientific personnel involved in crocodile conservation programme, project tiger and other wildlife conservation activities *in situ* and *ex situ* have produced the bulk of information and literature available today about the target species and the activities for conservation and management. Administration has come to recognize that research personnel form the assured base for access to information. Most often these research persons carry out most of the interpretation work for a project. Special Projects like that for vulture breeding is awaiting a suitable research person to remain in charge of it.

Grooming authors who work and write

My professor from University days, Professor B. K. Behura says research is incomplete without a publication. Yes, unless observations are published, a new researcher joining at some later stage wastes days or years in rediscovering what is already known. At this stage come the aspects like authorship of an article or a research paper, and the choice for a journal.

Considering the actual role of a researcher and the need for sustainability of the pursuit for popularization of scientific research, authorship has to be given due consideration. Administrators or technocrats who adorn chairs for supervision need to be open hearted in giving credit. A scientist often works just for the shake of recognition!

I was recently writing my reaction in response to a blog about the not very happy experience for authorship status like first, second, third, etc. in a publication. The contention is about who will be the first author, and what order should be followed upto the last author. In scientific laboratories some kind of understanding seems to have prevailed. This is not true in non-research organisations, where the principal or prime researcher normally brings into his fold of confidence as many 'authors' as possible. At the end the authorship credit may appear to be a hierarchical testament under the title of the paper.

When it is a management prescription it is, however, a good idea to have that kind of authorship. People who matter get encouraged and also implement its advantages. Nevertheless, I have also noticed that although I have many coauthors during the course of my 36 years of research, very seldom have they produced a technical publication even in their next posting. I have a notion that publication potential is everywhere and in every posting of a person.

During Post-Graduation it was training and, therefore, customary to follow the hierarchy or age-seniority in a research paper. I have taken the facts in that spirit. Things were different after M.Sc. In this context I must pay my tribute to one person– Dr H. R. Bustard, the FAO Consultant in India for Crocodile Conservation programme. The project started during 1970s, and there I started my professional career. Dr Bustard was the field guide and non-official Ph.D. guide for me. He had issued a circular very early about the principle to be followed for authorship of technical papers. If it was equal contribution starting from an idea to experimentation or data collection and writing, the authorship was alphabetical, though Dr. Bustard had the alphabetical advantage over me. For other instances, depending on contributions the first authorship was shared among us.

That was a very healthy practice. Other co-researchers were also happy with that. It got flouted when I had to write with (for) others. Yet, I always expected, sometime somewhere somebody should bring my name to the first, or while giving a talk or powerpoint presentation at least used a 'plural term' to indicate that the analysis was done with others in the administrative set up. Very seldom did it happen, if it ever did. That sometimes hurts a field researcher, and it dampens the spirit of continuing the pursuit of writing for popularization of science!

Where should I publish my work!

The year of start, the international stature of the wildlife project and the locations for my field work were such that most of the observations were new and worth reporting or publishing. Out of over 250 write ups by me only about a dozen may be overseas publications. Others are in Indian journals but with overseas circulation. I always exercised my own choice and option for a journal. I have chosen the journal in such a way that the publication reaches the right audience or the right user.

When I am writing about a new technique which field foresters are to use, I choose Indian Forester which reaches all Divisional Forest offices of India and many desks overseas. When it is a biological note on an Indian species I have chosen the Journal of Bombay Natural History or Hornbill. When the observations or discussions have implications in captive management of animals in India I chose the Zoos' Print. A very old time journal is Cheetal published by the Wildlife Preservation Society of India, Dehradun. These are very widely circulated and established journals for wildlife matter. The WWF Newsletters, the IUCN Specialist Group Newsletters and Sanctuary-Asia are some of the other publications for submitting write ups.

In those days, there was no 'impact factor' of a journal, and there was nothing like internet to browse and search. I had to build my own library. For the last four decades I have been carrying bulks of paper wherever I went. I came to know about impact factor when my daughter started publishing her work on nano medicines and discuss with me issues relating to it while selecting a journal for submission of papers. In modern days the 'impact factors' seem to be the basis for judging the scientific status of a scientist.

Inspired, I searched the net for any possible impact factor given to my journals, but no. My journals, although very special in their kind and used by field workers, had nothing like an impact factor. I am not aware, what exactly is the situation today. I cannot comment on medical science research, which has global implications. And the trend is changing in the world of research.

What I drive to say is that present-day wildlife scientists are competing to gather 'impact factors' through publication of their data overseas, but its utility is often lost to actual field level users. Therefore, where field research involves natural history or techniques for sanctuary management, one must not worry where the journal is published or what is it's impact factor; but must think whether the contents of the writing reaches the field staff and field biologist who will benefit from this and shall not spend time in rediscovering what has already been discovered. They should instead carry the work ahead from the point where it is left at that moment. In this respect there should be a mention about the open access journals on the internet these days. These are very good, very quick, available on the net, and perhaps with some impact factors, if someone is bothered about it.

Institution Heads and Administrators who are assessing their wildlife scientists for promotion or a higher scale should not be fussy about the impact factor. Instead mechanisms should be devised to assess usefulness of the research in the field. Unless this is done, wildlife science will have a difficult road for poularisation.

Field-translation of professional lessons from ingenous masters

As a fresher in wildlife research I had the first opportunity to listen to Saroj Raj Choudhury when he explained near a stream along Tikarpada-Purunakote road on how to interpret hooves marks indicating stampede behaviour of a herd of spotted deer. The herd might have heard or sighted a predator, perhaps the tiger. Through that, Choudhury was giving the basic guidance on how a practitioner of wildlife research should remain alert for visual signs as well as smell and sound to make his field studies fruitful and safe.

During my work in the Mahanadi I had nearly six and a half years of field work with the help of Raja Behera and the team comprising his nephew Prafulla and son Amulya. All three were engaged as Gharial Guards at Tikarpada, as a strategy towards demonstrating 'people's involvement in crocodile conservation. Many other experienced persons like Narottam and Shiba joined as Gharial Guards later. All of them were boatmen and fishermen by profession. They were able to negotiate their narrow long wooden boat on the waters of Mahanadi along the downstream or upstream or in high flood with as much ease and comfort as they did it during low waters of winter and summer. I had my first lessons of rowing a boat from Prafulla and Amulya.

More important, from Raja and others I also learnt how to spot and confirm the sighting of a crocodile on water surface or on sand banks. Then, there were training sessions by Dr. Bustard on how to eye-estimate the length of crocodiles from a distance.

Those were initiations which kept me water-borne and study crocodiles. Rest of the happenings in my career demonstrated that indeed 'necessity is the mother of invention'. I wanted to judge the size of the crocodile from just the portion of the head that remained surfacing on water or the various kinds of tale telling spoors of a crocodile that had basked on sand banks. Then I devised the methods for size estimation from body spoor. Similarly, was the invention of the technique to individually identify hundreds of crocodiles from their tail-scute colour pattern. These are simple field techniques that keep the science accessible, usable and popular.

Field techniques have to be comprehensible in implementation and interpretation

One of the major scientific activities in wildlife management is census of wildlife species, at least a few indicator or flagship species, which can indicate the condition or happenings in the entire habitat. The results of census attract the attention of the public, media and the concerned administration. Census results form an easy and direct access to the story of performance of the project on species conservation.

Observing wildlife in natural conditions is not easy because wild animals have learnt to avoid threats or disturbances. That is their strategy and adaptation for survival. The task is more difficult when ground vegetation is dense and high. Determining the exact numbers of wild animals is a difficult technical requirement but has to be carried out with man power available within the Forest Department. By conducting the census the staffs get a first hand feel of the status of the animals inhabiting their jurisdiction, and have a sense of belongingness. Therefore, the technique has to be staff-friendly, something which they can understand, implement and interpret.

For every occasion of wildlife census in Similipal, about 25 participants from different parts of the state and a few from other states and even overseas join the staffs as non-official volunteers. They all belong to very different walks of life. They are given orientation training about the method of census and the jungle-etiquettes. They live with Forest Guards or watchers in tree-top machans or Beat-Camps and carry out field work during the entire period of census. Again, some of them come back for analysis and interpretation of data, and drawing of spatial distribution map of the species counted. For tiger and leopard they become conversant in pugmark tracking method and for elephants it is direct sighting.

A few of these participants have chanced into my office after several years and interacted with me. In these years some of them have reached new heights of career excellence but they continue to be passionate as before. They have expressed that the visit they had to Similipal has left a permanent impression in their mind and action. I feel that the level of interactions with them and the quality of data they handled were responsible for such lasting memory. The Science of Wildlife Conservation has to be easy and understandable through simple biological explanations and the application of common logics.

Some lessons and guidelines

There is no shortcut in Wildlife Science. It has to be backed with full quota of rigorous field exercises carried out locally in the heat or frost, soiled knees or knee-deep humus. While popularising Wildlife Science some of the lessons learnt and that may form recommended guidelines are as follows.

- The staffs of the wildlife organization who implement the project in the field must feel themselves a part of the science that is in practice, and should be able to take pride in explaining the subject and the related activities hey are doing. These staffs include grass root level persons like the Forest Guards as well as Research Scholars who join with career ambitions.
- The people who live within the forest or its fringe who have already contributed a great deal of traditional knowledge, should be comfortable with the new tools and participate in various management actions directly or indirectly, with a sense of belongingness.
- The spectra of administrators, intelligentsia in the society, public representatives, media persons and other stake-holding organizations, who too play a substantial role in sustenance of pursuits linked with 'Wildlife Science' must understand the language of the science and be able to convincingly explain these to others in apropos of their own activities.
- In order to achieve the above objectives the Wildlife Conservation Project should have effective monitoring mechanisms.