Chapter – 08

RESEARCH, MONITORING AND TRAINING

Research is one of the major issues in the Plan Outline of the Project Tiger document, 1972. The document envisaged that the scientific staff of the reserves would undertake basic research programmes aimed at evaluating systematic factors and influences, for devising pragmatic management practices to cover specific populations and the entire ecosystems. Research constitutes a very important aspect of effective management of wildlife protected areas. Research based wildlife management is crucial for the success of any Tiger Reserve. This is a legitimate activity, and must be compatible with the objectives of wildlife management in the protected area. The Tiger Reserve should have a clear wildlife research policy based on the following priorities.

8.1 Research Priorities

Wildlife management is a mix of field craft and science based on field research. Research in the Tiger Reserve should focus on the critical information needs, which are by and large common to most of our Protected Areas. Professional researchers working in isolation on topics or species relating to their field of interest can contribute very little for fostering wildlife management. The research should be "problem solving studies", based on a consultative process involving PA management, indigenous people and overall ground reality prevailing in our tropical setting. Some "pressure points" for PA management are common to most of our PAs, and in addition to the ongoing small term projects, wildlife research in Pench Tiger Reserve should preferably focus on these:

Table No. – 98

PA Managerial Priorities	Research Areas
A) **Values Relating to PA :** 1. Ecological/ Regional landscape	- Regional changes in species richness & diversity - Changes in species occurrence - Effect on water table - Habitat fragmentation - Endangered species: prey base, age/ sex ratio, biomass computation, life table computation
2. Habitat degradation	- Types of exotic infestation - Control methods
1. Livestock depredation by carnivores & crop damage by wild ungulates	- Reasons for livestock depredation - Percentage of livestock in the food-spectrum of carnivores - Reasons for crop damage
4. Habitat management practices	- Biodiversity conservation vis-a-vis management practices in-vogue
5. Poaching	- Magnitude - Modus operandi (variations) - Wildlife crime intelligence and networking - Wildlife crime prevention
6. Fire	- Nature and efficacy of existing preventive and control measures - Changes in the habitat due to fire - Changes in animal use pattern due to fire
7. Insects as agents of ecological change	- Impact (magnitude) - Ecological changes - Periodicity
8. In-situ conservation	- Founder population size - Translocation

9. Eco-tourism	- Involvement of host-communities - Mechanism - Impact assessment
10. Jurisprudence	- Morphological studies - Biochemical studies - DNA fingerprinting
11. Wildlife disease	- Landscape epidemology studies - Linkages between sylvatic & pastoral cycles
12. Animal monitoring and estimation techniques	- Customisation of softwares suited to Pench setting - Estimation procedures, indices for various species - Home range studies
B) Study of Wetland (Totladoh Reservoir)	- Vegetative succession in the entire wetland, especially in regard to weed invasion in draw down area. - Detailed ecology of the fauna of the wetland, especially invertebrate fauna - Effect of agricultural and other practices in the catchment area of Pench river outside the park on the long term viability of the wetland.
C) Biotic Pressure on PAs: Vision beyond the PA Interface problems	 - Effect of existing land use - Mechanism/ strategy to mitigate ill effects - Magnitude of crop damage outside PAs - Methods for mitigation - Decadal population growth in impact zones outside PAs (human/ cattle) - Resource use pattern of indigenous people - Impact of PAs on indigenous people - Legal status of the impact zone & related problems - Community role in conservation - Levels of sustainable use - Grazing impact - Regeneration status in right burdened forests - Impact of rights and concessions on habitat quality - Socio-economics of indigenous community - Resource requirements of indigenous people & dependencies - Traditional knowledge & occupation of indigenous communities - Impact assessment of Eco-development woks

Apart from the above biological/ ecological researches, the Pench management should also encourage the collection of relevant information on the effects of the Tiger Reserve on local economy and communities of the surrounding villages. Such social researches should also be developed into reports, status papers, microplans, and other documents resulting in the formation of effective policies for upliftment / eco-development of local communities. Although these social projects may sound purely academic or official, and may not have any immediate obvious management significance, they would prove to be of a great value later, as the present scenario of the park - people interface in our country is bound to go a very long way.

8.1.1 Future strategy: -

1. Development of Infrastructure

A. Research Labs -

One main Research Lab at Seoni and two Field Lab at Karmajhiri and Jamtara have been constructed. Few instruments for research have been provided. The addition instruments required for differents field research may be procured. There is an urgent need to carrying out systematic and basic research related to habitat, herbivore and

carnivore status population density habitat use pattern etc. and impact of various works being carried out in an around the Protected Area. There is an urgent need of full time research officer, researcher and assistants.

B. Meteorological Stations –

Metrological Station at Alikatta, Dhutera and Kokiwara have been established. There is an urgent need to take proper information and collate the data systematically.

Similarly, Chemical Immobilization equipment and drugs would also be required to capture the diseased or other wild animals in stress requiring help and treatment. This procurement has recently been done.

C. Constitution of Animal Rescue team:-

An Animal Rescue Team has been constituted by Field Director, Pench Tiger Reserve, Seoni, which will carried out the rescue and rehabilitation of wild animals. The details of team as following –

In-charge Officer	-	Dr. Akhilesh Mishra, Veterinary Doctor
Range Officer	-	Shri Manmohan Singh Jatav, R.O. Gumtara
Deputy Ranger	-	Shri D. K. Shukla, Deputy Ranger
	-	Shri Damodar Patle, Deputy Ranger
	-	Shri R. B. Pathak, Deputy Ranger
Forester	-	Shri Bhuwneshwar Patle, Forester
		Shri Kamlesh Washingtan, Forester
Forest guard	-	Shri Ravindra Meshram, Forest Guard
		Shiri Dayanand Soni, Forest Guard
		Shri Jilesingh Dhurve, Forest Guard
Experience Member	-	Shri Ajab Singh Batti
	-	Shri Guru Prasad Rajak

The team members will be trained in, tranquilizing, trapping the distressed animal and providing it first aid; and in application of various useful instruments.

2. Constitution of Research Advisory Committee

A Research Advisory Committee may be constituted with the following members–

(i)	The Chief Wildlife Warden, M.P.	Chairman
(ii)	C.F. Seoni	Member
(iii)	Field Director, Kanha Tiger Reserve	Member
(iv)	A representative from WII	Member
(v)	State Wildlife Health Coordinator from Veterinary College, Jabalpur.	Member
(vi)	Field Director, Pench Tiger Reserve	Member Secretary
	Any other Scientist / Forest officials, nominated by the Chief Wildlife Warden of M.P.	Member/Special invitee

The Committee would have the following main activities: -

(a) To finalize the selection/identification of relevant research based studies.
(b) To review the progress of research activities carried out for the PTR
(c) Provide suggestion/recommendations for improvement and smooth functioning of the research activities.

The meeting should be arranged as per the requirement, but at least once in six months. The members would be eligible to get TA/DA and other facilities, decided by the Government from time to time.

8.2 Research Projects

The following research works have been conducted by concerning agency under India Eco-development project –

Table No. – 99

S. No.	Consultancy services	Contracted Individual/ organizations
1	Baseline mapping of PA and surrounding areas	Proposed Small Earthen dam / ponds/Tank Construction in Core Area of PTR
2	Environmental Assessment of Regional Plan	Proposed Small Earthen dam / ponds/Tank Construction in Core Area of PTR
3	PA Level Visitor Management and Participatory Eco-tourism Study	Proposed Small Earthen dam / ponds/Tank Construction in Core Area of PTR
4	Process Documentation Research	The Indian Institute Of Forest Management, Bhopal
5	Documentation of traditional knowledge	State Forest Research Institute, Jabalpur
6	Study on wetland and riparian areas in PTR with diversity and status of fish and waterfowl and mammals	Zoological Survey of India, Jabalpur
7	Faunal Survey, on insects, fishes, reptiles and Amphibians; Conservation Status and distribution of Rare and Endangered Animals.	Zoological Survey of India, Jabalpur
8	Floristic Survey, Vegetation Description, Conservation Status And Distribution of Rare and Endangered Plants/Plants Communities contributed for Herbarium	Division of Biodiversity & Ecology, SFRI, Jabalpur
9	Mapping of the Protected Area (PA) & Surrounding Areas in Pench Tiger Reserve M.P.	WII Dehradun
10	Study on Wildlife health Disease Surveillance and monitoring	Veterinary College, Jabalpur
11	Development and establishment of long term ecological programme in PTR with reference to physical, biological and sociological aspects and linking it up with spatial data base	IIFM, Bhopal

Apart from above short-term research work, following research works have been conducted by individuals or organization.

1. Ecology of Gaur (Bos gaurus) in Pench Tiger Reserve M.P. – WII
2. Ecology of Wild Dog in Pench Tiger Reserve M.P. – WII
3. Ecology of Tiger in Pench Tiger Reserve M.P. is an ongoing project of WII with Management of Pench Tiger Reserve, financed - NTCA.
4. Ecological Studies and conservation of Tiger in India - Dr. Ullahas Karant – Wildlife Biologist, Maysur, Karnataka
5. Prey selection in Tigers & Habitat occupancy across anthropogenic disturbance in sympatric regulate species – WII
6. PA Management and Human dimensions - Ashsh Dwivedi, Indian Industrial Institute, Pawai, Mumbai
7. Ecology diversity and conservation oriented study on parasites of wild animal - Shri Milind Bavte, HOD Micro biology Department, Garwale college Pune
8. Research on Birds – WII
9. Study on understanding the ecological impact of the Pench Tiger Reserve, Seoni – PSI, Dehradun
10. Biodiversity Characterization at Landscape Level using Satellite Remote Sensing of GIS in M.P.

8.3 Monitoring Framework

The Park Management should continue to ensure that the monitoring of biological resources form a basic routine activity in protected area management, and it is the principal way in which the management can identify trends or changes, and so gauge the effectiveness of its managerial inputs. Though it may sound an unplanned and subjective procedure, it is easy to collect useful biological information in a simple, systematic and scientific manner. The management should strive to include a number of useful monitoring activities in the routine duties of the staff, as well as regular annual estimation of wildlife, counts and other activities. All such data should be incorporated in the MIS in a routine manner.

The Tiger Reserve should continue the present system of ecological monitoring of flora and fauna. As stated above, the Reserve has a very good network of forest camps covering all vegetation cover types and habitats of wildlife. All these forest camps have been provided with camp registers containing printed proforma of information/ data collection relating to the broad phenology of the vegetation type, species-wise animal sighting with their age-class and sex-class structures, females with fawns, lactating females, and others etc. The proforma for recording indirect evidence of tiger and panther has also been included. As far as the management is concerned, a useful inventory could be as simple as information on the distribution of important species, whose numbers reflects important ecological processes. Even crude indications of the numbers of these animal species would add to the value of inventory. A coloured photographic guide for identification of animals has been prepared and distributed among all the field staff. A photographic album of ground flora covering many species of grasses, herbs and forbs should be prepared and should be distributed to all field staff involved in the day to day monitoring to facilitate easy identification of species from the management point of view. The data generated from such continuous monitoring should later be inferred/ analysed into very interesting trends, and bases for species-specific and habitat specific planning in the Tiger Reserve. The proforma

of the above camp register is given below. Each Forest Guard in-charge of the respective camp must fill in the requisite information derived from the daylong patrolling of his beat. This would lead to the generation of a lot of data on the basic parameters required for managing a wildlife protected area.
The data can be complied for large carnivore on the basis of camp registers and monthly presence map for tiger and panther may be prepared.

Table No. – 100

Format of Patrolling Camp Register for Routine Ecological Monitoring

Particulars of Patrolling			Phenology			
Date	Place & Compartment No.	Time	Flowering trees/ Plants	Fruiting Trees/ Plants	Leaf Fall	New Leaves
1	2	3	4	5	6	7

Herd Structure of Ungulates														
Total No. of Herds (Chital/ Sambar/ Nilgai/ Gaur)	All Male Herd				Female-Fawn Herd				Mixed Herd					
	Adult	Sub-Adult	Fawn	Total	Adult	Sub-Adult	Fawn	Total	Male Adult	Male Sub Adult	Female Adult	Female Sub Adult	Fawn	Total
8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

Various Stages of Antler Development					Birth Frequency of Ungulates (15 days Intervals)		Stages of Gestation	
Males with Fallen Antlers	Males with Developing Antlers	Males with Branched velvet Antlers	Males with Developed Hard Antlers	Total	Date	Total New Borns	No. of Pregnant Female	No. of Lactating Females
23	24	25	26	27	28	29	30	31

Data/ Evidence Relating to the Tiger										
Male/ Female Pugmark (No./ Unit Distance Walked)	Urination (No./ Unit Distance Walked)	Scraping (No./ Unit Distance Walked)	Call (No./ Unit Distance Walked)	Scratches (No./ Unit Distance Walked)	Scat (No./ Unit Distance Walked)	Cattle Kill	Other Kill	Stride Measurement	Straddle Measurement	Signature Inspecting Officer
32	33	34	35	36	37	38	39	40	41	42

A few monitoring studies are being conducted in Pench Tiger Reserve to assess the impact of habitat improvement interventions with the help of some simple formats being filled by lower field staff. These formats are presented in the **Annexure No. – 35.**

8.4 Training Needs Assessments

Though the management of the Pench ecosystem itself is a learning process for the majority of the frontline staff, the Park Management should ensure that the newly inducted staff undergoes wildlife training conducted by various Institutes in the State and outside. Officers should be encouraged to undergo Diploma as well as Certificate and Capsule courses conducted by the Wildlife Institute of India, Dehradun for officers down to the Forest Ranger. The information about the training and institute providing training is as following –

Table No. – 101

S. No	Course Name	Course Type	Course Duration	Participant Level	Resource person/ org.	Frequency
1	Improved Wildlife Management	Diploma Course	Nine Months	A.C.F./DCF	WII, Dehradun	Once
2	Eco-development	Module	Three Months	A.C.F./DCF	WII	Once
3	Improved Wildlife Management	Certificate Course	Three Months	F.R.	WII	Once

Besides, Forest Guards posted in wildlife area should be trained as Game Guard in Bandhavgarh Training School, Tala. Apart from above basic training, some very important training are require to staff/officers for their day to day functioning.

1. Weapon training -

The staff has to face the anti-social elements including hard-core criminals, who are engaged in unlawful activities. To have an effective control, the staff must be equipped with modern arms and ammunitions and should know how to handle the arms ammunitions. Thus full course training to handle the arms and ammunition should be arranged for the field staff on regular basis.

2. Wildlife Health Monitoring Training

Monitoring of wildlife health and treatment of various contagious diseases require some technical skills. The staff must also know the techniques to collect samples to send it to forensic laboratory or to the research centre at WII, Dehradun for its detailed analysis.

3. Chemical immobilization training -

It has been realized that frequent strayal of wild animals occurs near the human habitation especially during summer season. Such unusual situation creates problems, both for wild animals and human beings. Such animals, that come under distress should be safely captured to release in wild after proper treatment.

4. Tourism and interpretation training

Tourism and Interpretation are very sensitive issues. Even a slight discourteous behavior can defame the PA as well as the Forest Department. The staff engaged in handling the tourists must be properly trained to handle the situation in a cordial manner. In doing so, the implementation of various Rules and Enactment, related with the wildlife tourism and management, is ensured also. Similarly, staff deputed for interpretation activities must have sufficient knowledge about the Protected Area and other on-going activities. If the tourists are not satisfied for their queries, the purpose of extension and Interpretation can not be achieved. A fundamental training and regular refresher course training to the staff should be done. At present no systematic training on tourism and interpretation activities has been organized.

5. Computer Application Training:

Use of Computer application and related software has now become an indispensable task for day-to-day management. Application of GIS and other related software and their interpretation could improve the efficiency of the P.A. Management. All these efforts may be useful, when the staff capable enough to handle these machines. Hence three- month **Capsule course training** for the selected staff / officers should be arranged at Seoni.

Apart from these training some other important topics may be included if required.

8.5 Human resources development Plan (HRD Plan)

Wildlife management is a specialized branch, which need special orientation, skill and knowledge. Training makes a technocrat and field staffs perfect in his profession. Exposure of good efforts done in the *Par excellence* site develops a feeling of motivation to achieve the goal to the same degree or sometimes higher also. Not only this, tremendous degree of confidence is also developed if the initiative done is appreciated by others. Hence it is nice to initiate effort to impart special training to all level of staff in various relevant fields.

Imparting of training to the field staff and the official posted in the Pench Tiger Reserve has got much relevance, as they have to handle sensitive bio-diversity conservation vis-à-vis eco-development issue. Although adequate technical assistance and guidance would be availed from the concerned experts. Hence imparting regular refresher courses covering different topics is recommended for the various levels of staff of Pench Tiger Reserve as following -

Table No. – 102

S. No	Course Name	Course Type	Course Duration	Participant Level	Resource person/ org	Frequency
1	General wildlife management course	Orientation Course	One week	D.C.F./C.F.	WII, Dehradun	Once
1 a	--do--	Orientation Course	10 days	A.C.F./ D.C.F.	WII, Dehradun	Once

1 b	--do--	Orientation Course Module I	One week	Dy. Ranger Foresters, & Forest Guard	Wildlife training school, Bandhavgarh (M.P).	Once
1 c	--do--	Orientation Course Module II	Two weeks	Dy. Ranger Foresters, & Forest Guard	Wildlife training school, Bandhavgarh	Once
1 d	--do--	Orientation Course Module III	One week	Dy. Ranger Foresters, & Forest Guard	--do--	Once
1e	--do--	Orientation Course Module IV	Two weeks	Dy. Ranger Foresters, & Forest Guard	--do--	Once
1f	--do--	Orientation Course Module V	Two weeks	Dy. Ranger Foresters, & Forest Guard	--do--	Once
1g	--do--	Orientation Course Module VI	One week	Dy. Ranger Foresters, & Forest Guard	--do--	Once
1h	--do--	Orientation Course Module VII	One week	Dy. Ranger Foresters, & Forest Guard	--do--	Once
1i	--do--	Orientation Course Module IX	One week	Dy. Ranger Foresters, & Forest Guard	--do--	Once
1j	--do--	Orientation Course Module X	One week	Dy. Ranger Foresters, & Forest Guard	--do--	Once
2	Soil and moisture Conservation	Orientation Course	One week	Dy. Ranger Foresters, & Forest Guard	WALMI, Bhopal	Once in a year
3	Rural development	Orientation Course Module II	One week	Dy. Ranger Foresters, & Forest Guard	State Rural Development Institute, Jabalpur	Once in a year
4	Enforcement of Law and Enactment's	Refresher Course	Three days	Range officers Dy. Ranger Foresters & Forest Guards	Circle Headquarters or at Seoni	Once in six months
5	Fire protection training	Local training and Orientation course	One week	Dy. Ranger Foresters, & Forest Guard	Should be organized locally at Divisional level	Once in a year
6	EDC account keeping capsule course	Refresher course	Three days	EDC chairmen and associated staff	Divisional Headquarters at Seoni	Once in Two year
7	Research and Monitoring course	Capsule course	One week	DCF, ACF, Range officers, Foresters and Forest guard.	WII, Dehradun for DCF and ACF; Wildlife training school, Bandhavgarh For lower staff	Once in Two year
8	Education Awareness course	Refresher course	One week	ACF, Range officers, Foresters and Forest guard	WII, Dehradun for DCF and ACF; Wildlife training school, Bandhavgarh For Foresters and Forest guards.	Once in two year

The senior as well as lower field staff should be exposed to latest trends and developments achieved in different subjects related with wildlife management. Such exposure would help the field staff to carry out various management practices for effective management. A regular short- course requires to be organized from time to time for the ground level field staff to impart technical expertise to carry out various routine works, like; population estimation, water hole management, wildlife habitat management and the like.

To impart training in the above topics and other useful subjects, the selected staff should be sent to Wildlife training school at Bandhavgarh (M.P.) and other concerned institute, like; the State Rural Development Institute, Jabalpur, State Forest Research Institute, Jabalpur, Water And Land Management Institute (WALMI), Bhopal and the like.

Conducting Study tours at par-excellence sites: -

(i) Eco-development study tour for EDC members and associated staff
(ii) Wildlife management study tour for Officers & field staff.
(iii) International study tours
(iv) Working visit for PA Director

Workshops and Field Study : -

Every year workshop and field study should be organized at PTR level to share the experience gain during the field works and disseminate the new knowledge and practices being used in other PAs. Some of the topic for workshop and field study may be -

1. Wildlife and its habitat monitoring and understanding the objective of data collection during regular patrolling.
2. Wildlife census and field techniques
3. Anti poaching, Legal proceeding and forensics
4. Micro planning for eco-development in surrounding villages
5. Fire protection training
6. EDC Account keeping
7. Environmental Education and Awareness
8. PA planning workshop
9. Regional planning workshop
10. PA management plan finalization workshop

During these types of workshop and field training regular interactions/ discussions between officers and field staff would also add to the understanding of new perspectives relating to wildlife management.

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