Evaluation of Biosphere Reserve Scheme

Achanakmar-Amarkantak Bioshere Reserve

Lead Institute: Tropical Forest Research Institute, Jabalpur (Madhya Pradesh)

Information in respect to the queries are as follows :

i. Whether the Scheme has achieved its objectives : Yes

The achievements made during the Phase-I (2006-2009) and Phase-II (2010-2013) of Lead Institution project, in respect to the eight objectives assigned by MoEFCC are as follows :

Objective-I : Collection, synthesis and dissemination of research based information in respect of biosphere reserve from all sources.

Consulted and collected current literature and information on flora, fauna and socio-economic aspects from scientific journals and internet which used for updating on the basis of new publications. The information gathered was compiled in six issues of Biosphere Reserve Information Series.

Objective-II : Interaction with regional research organizations for development of suitable research projects.

Scientific organizations including various universities of Madhya Pradesh and Chhattisgarh, viz. Guru Ghasidas University, Bilaspur, (CG), Awadh Pratap Singh University, Rewa (M.P.), Indira Gandhi Agricultural University, Raipur (CG), Jawaharlal Nehru Krishi Vishwa Vidhyalaya, Jabalpur, Zoological Survey of India, Central Zone, Jabalpur, State Forest Research Institute, Polipather, Jabalpur, School of Studies in Zoology, Jiwaji University, Gwalior, M.P. and Jaiv Vividhta avam Adivashi Vikas Anushandhan Network, Jabalpur, (M.P.) were visited for interaction with scientists and academicians. They were encouraged to submit the research project proposal on Achanakmar- Amarkantak BR to MoEFCC, Government of India for funding.

Objective-III : Undertake research and develop data bank.

Seven sample plots laid out in core and buffer zones to study soil nutrients, soil moisture, and population density of trees, shrubs, herbs and regeneration status.

Collected meteorological data (temperature, humidity and rainfall) of core and buffer zones of the biosphere reserve.

Observations recorded on regeneration status of tree species in the established permanent plots in core and buffer zones representing different vegetation types.

Recorded status of 28 selected economically important threatened flora from core and buffer zones.

Surveyed biosphere reserve during rainy, winter and summer seasons, collected and identified 39 species of butterflies and 34 species of moths. Among the butterflies and moths, 17 and 30 species respectively were recorded for the first time from this biosphere reserve. This is being a new addition to the insect faunal composition of Achanakmar-Amarknatk biosphere reserve.

Collected information on population of different villages as per census 2001 and shifted inhabitants from six villages of core zone to buffer zone of biosphere reserve.

Objective-IV : Maintain regular interface with the Biosphere Reserve managers to assess the research needs and crucial areas requiring research efforts and providing research inputs for inclusion in Management Action Plan.

Organized a workshop at TFRI Jabalpur on Research needs for Achanakmar-Amarkantak BR and gathered latest information on taxonomically identified species of lichen, ferns and various threats to fauna and flora and various approaches to uplift the economic status of forest dwellers.

Meetings were held with BR manager to assess the research needs in crucial areas such as tree mortality in biosphere reserve and other activity like monitoring and evaluation of developmental activities of MAP.

Suggestions were also given to the BR manager with regard to rehabilitating the land through development of grassland in villages shifted from the core zone of biosphere reserve.

Disseminated research based information by conducting six one day workshop/ training for front line staff representing all the ranges from the three zones of biosphere reserve.

Objective-V : Publication of a compendium of up to date information and bringing biannual publications aimed at educating stakeholders.

Published Compendium and four issues of Biosphere Research Information Series (BRIS) Vol.1(1), Vol.1(2), Vol. 2 (1-2) and Vol. 3 (1-2). Carried out compilation of Biosphere Reserve Information Series (BRIS) Vol.4 (1-2) for its publication.

Objective-VI : Preparation of project document for designation of new BRs in coordination with concern State Government.

Discussed with BR Manager on preparation of project document on Abujmarh for designation of new BR in Chhattisgarh.

Objective-VII : Formulation of project proposals for designation of Indian Biosphere Reserves on World Network of BR recognized by UNESCO.

Submitted nomination document of Achanakmar-Amarkantak biosphere reserve to United Nations Educational, Scientific and Cultural Organization (UNESCO) through MoEFCC, GoI, for inclusion in World Network of Biosphere Reserves (WNBR). International Coordinating council of UNESCO's man and the Biosphere (MAB) programme, at its 24th session held at UNESCO headquarters in Paris from 9th to 13th July, 2012 approved the inclusion of Achanakmar-Amarkantak biosphere reserve in its world's network of Biosphere Reserves.

Designed webpage on Achanakmar-Amarkantak Biosphere Reserve under Lead Institution and linked to the official website of TFRI, Jabalpur (http://tfri.icfre.org/AABR/aabr-INDEX/index.html) to exchange and share information and technology.

Objective-VIII : Any other assignments which may be entrusted by Central Government to achieve the larger objectives of the scheme.

Performed duties assigned by MoEFCC, GoI, for Hon'ble High Court Case on some legal issues related to Achanakmar – Amarkantak biosphere reserve.

ii. Details of funds released & utilized during the XII Plan period

Phase-I (2006-2009)

Amount received			Total amount received	Expenditure				Total expenditure	Balance
2006-07	2007-08	2008-09		2006-07	2007-08	2008-09	2009-10		
200000	193544 178000	236800 237000	1045344	188172	382470	414787	57077	1042506	2838

Phase-II (2010-2013)

Opening balance	Amount received			Total amount received	Expenditure			Total expenditure	Balance + Bank interest
	2010-11	2011-12	2012-13		2010-11	2011-12	2012-13		
2837.99	487162	598418	446427	1534845	422150	542043	349268	1313461	221383.99 + 1451 =222834.99

Refunded balance amount of Rs. 2, 22, 834.99/- only through UBI DD bearing No. 602334 dated 31.03.14 to PAO, MoEFCC, New Delhi, vide this Office letter No. A/c 2-13(32)/TFRI/Lead-MoEF/Jbp/2006-07/139 dated 16/04/14

iii. Achievements during the different Plan periods

Phase-I (2006-2009)

The forest vegetation in the BR is Tropical Deciduous type and is classified into Northern Tropical Moist Deciduous and Southern Dry Mixed Deciduous Forests.

In all, 1498 identified species of flora consisting of 7 algal species, 178 fungi, 130 species of lichen, 16 species of bryophytes, 40 pterodophytes, 16 species of gymnosperms and 1111 spcies of angiosperms.

Nearly 51 species of angiosperms and 7 species of pterdophytes, natural growing or cultivated in BR, have great demand for preparation of Ayurvedic medicines. Besides this, 3 species of flora are endemic, 282 species are rare and 39 species are threatened due to over exploitation and habitat loss.

The faunal resources are also very rich and varied from soil microbes to arthropods, scavengers, phytophagous, omnivorous and carnivorous species. About 117 identified species of invertebrates including variety of beautiful butterflies, moths, beetles, centipedes and 210 identified species of vertebrates including beautiful mammals, birds, reptiles, amphibians and fishes enhance the beauty of the BR. Out of 327 identified species of fauna in different ranges of BR, about 17 % species are regionally threatened to various categories.

Human- wildlife conflict caused by snakes, wild boar, leopard, sloth bear, etc. is often reported from different ranges of the BR. the maximum incidences are due to sloth bear followed by jackals, leopards, hyena and wild boar. The reason is probably due to degradation of forest areas, fragmented and interspersed agricultural fields.

Nearly, 7,617 traditional primitive tribal inhabitants ar per the population census of the year 2001 are settled in 22 villages of the core zone whereas 4,40,404 inhabitants live in 396 villages and suburban areas of buffer and transition zones of the BR.

There are 27 communities living in different zones and these are Baiga, Dhanwar, Kol, Kanwar, Oraon, Chamar, Sais, Basora, Lonia, Muslim, Sindhi, Brahmin, Rajput, Goswami, Baraith, Kolar, Kumhar, Kewat, Nai, Ahir, Panika, Sondhiya, Lohar, Maratha, Sonar and Bania.

Research projects are continued on various aspects of Achanakmar-Amarkantak BR. Hence, regular collection of scientific information and then disseminate it to BR managers to incorporate in management plan, is essential need of the hour. The present system should continue in the near future also.

Publications :

Anonymous (2007). Achanakmar-Amarkantak Biosphere Reserve. Compendium. Tropical Forest Research Institute, Jabalpur. 69 pp.

Anonymous (2007). Achanakmar-Amarkantak Biosphere reserve. Biosphere Reserve Information Series (BRIS) **1**(1) : 134 pp.

Joshi, K.C. and Mandal, A.K. (2007). Research needs for Achanakmar-Amarkantak biosphere reserve. Proceedings of Workshop held at Tropical Forest Research Institute, Jabalpur on 30th April, 2007. Tropical Forest Research Institute, Jabalpur. 153 pp.

Anonymous (2008). Achanakmar-Amarkantak Biosphere reserve. Biosphere Reserve Information Series (BRIS) **1**(2) : 86 pp.

Joshi, K.C., Roychoudhury, N. and Barve, S.K. (2008). New addition to the moth and beetle fauna of Achanakmar-Amarkantak biosphere reserve. *Indian J. Trop. Biodiv.* **16**(2) : 179-184.

Phase-II (2010-2013)

- Achanakmar-Amarkantak biosphere reserve is a paradise of biodiversity. The biosphere reseve is blessed with a total of 1738 identified floral species (7 algae, 238 fungi, 184 lichens, 44 bryophytes, 53 pteridophytes, 16 gymnosperms, 1196 angiosperms, 335 monocot, 861dicot). They yield spices, food, ayurvedic medicines and timbers. Around 184 species of plants have been identified for their ethnobotanical and ethnomedicinal uses. Besides these, there are 389 identified faunal species consisting of 179 species of invertebrates (5 centipedes, 66 butterflies, 66 moths, 41 beetles, 1 cricket) and 210 species of vertebrates (16 pisces, 10 amphibians, 15 reptiles, 144 aves, 27 mammals). Further, 192 species of plants have been identified for their ethnobotanical (73 species) and ethnomedicinal uses (119 species).

- Interacted with regional research organization to develop suitable research project for the benefit of the local peoples of the biosphere reserve. Synthesized data of meteorological observations of biosphere reserve to understand climate change and global warming. The data on density of tree species, species richness and their regeneration status indicated good regeneration both in core and buffer zones of biosphere reserve. Recorded status of 28 selected economically important threatened flora from core and buffer zones. Survey of biosphere resereve in different seasons revealed 73 species of lepidopteran insects (39 butterflies and 34 moths), of which 17 species of butterflies and 30 species of moths recorded for the first time from this biosphere reserve. This is being a new addition to the insect faunal composition of Achanakmar-Amarknatk biosphere reserve. Provided information on population of biosphere reserve and movement of inhabitants from six villages of core zone to buffer zone.

- Disseminated research based information by conducting workshop/ training for front line field staff and published Biosphere Research Informations Series (BRIS) and distributed to all stakeholders.

- Included Achanakmar-Amarkantak biosphere reserve in its world's network of Biosphere Reserves (WNBR) by UNESCO's man and the Biosphere (MAB) programme. To provide all these information, webpage on Achanakmar-Amarkantak Biosphere Reserve under Lead Institution has been designed and linked to the official website of TFRI, Jabalpur (http://tfri.icfre.org/AABR/aabr-INDEX/index.html), to exchange and share technology.

Publications :

Anonymous (2010). Achanakmar-Amarkantak Biosphere reserve. Biosphere Reserve Information Series (BRIS) **2**(1-2) : 158 pp.

Anonymous (2012). Achanakmar-Amarkantak Biosphere Reserve. Biosphere Reserve Information Series (BRIS) **3**(1-2) : 93 pp.

Kushwaha, D.K., Barve, S.K. and Roychoudhury, N. (2012). *Ypthima avanta* Moore (Lepidoptera : Satyridae) – a new addition to the butterfly fauna of Achanakmar-Amarkantak biosphere reserve. *Indian J. Forestry* **35**(2) : 231-234.

Roychoudhury, N., Chandra, S. and Deepa, M. (2013). *Botyodes asialis* Guen. (Lepidoptera : Pyralidae) – a new addition to the moth fauna of Achanakmar-Amarkantak biosphere reserve. *Indian J. Forestry* **36**(4) : 455-458.

Joshi, K.C. and Sharma, R. (2012). Achanakmar-Amarkantak biosphere reserve, central highlands, India. In : Compendium on Indian Biosphere Reserves (Eds. L.M.S. Palni, R.S. Rawal, R.K. Rai and S.V. Reddy), pp. 152-160. Ministry of Environment and Forests, Govt. of India and G.B. Pant Institute of Himalayan Environment and Development.

Roychoudhury, N., Sharma, R., Yadav, D. K. and Kushwaha, D.K. (2012). Achanakmar-Amarkantak biosphere reserve : a paradise of biodiversity. *Vaniki Sandesh* **2**(4) : 27-37.

iv. Suggest ways and means to improve the modalities of the Scheme

The biosphere research scheme is a great opportunity for scientists, foresters and academicians to carry out research in natural biome or biological laboratory to understand dynamics of forest ecosystem, flora and fauna, including wild life, landscapes and peoples residing in and around biosphere reserve. It involves high level of coordination and cooperation between Lead Institution and Forest Department for the improvement and development of biosphere reserve as well as enhancement of livelihood options of tribal communities. The biosphere research scheme needs to continue and more sites should be identified and designated as Biosphere Reserves, so as to not only protect the environment, but also provide livelihood security to local communities.

Biosphere reserves serve to combine three main functions, viz. conservation, development and logistic support. Research and monitoring in biosphere reserve is not only crucial but constitutes the very basis of designing developmental strategies and solutions for management of relevant problems. Education and training among the front line staff of the Forest Department and local communities are essential components for the management of biosphere reserve in order to understand modern concept of conservation and sustainable use of biological resources.

Research on biosphere reserve needs to be diverted to improve quality and quantity of ecosystem services, improvement of species of economic interest, ecotourism and socio-economic upliftment of local communities through income generation activities. There is a need to conserve endemic species, threatened economically important plants and animals and their habitats. It is also necessary to remove or eradicate unwanted plants, such as invasive alien species.

The meeting of the Standing Finance Committee (SFC) held on 30th April, 2013 at MoEFCC, New Delhi, approved the continuation of Biosphere Reserve Scheme from XI to XII plan period. Further, it has been mentioned that Lead Institutions must be revived and proactively involved in the biosphere reserves and a Lead Institution needs to be identified for each designated BR. Such a step would ensure that the Lead Institute becomes a repository of all technical, scientific, financial and social knowledge for the particular BR. The identified Lead Institutions could also play a major role in advising and providing scientific and technical inputs to the State Level Steering Committees, as well as Local Committees. Lead Institutions should show the way forward to State Governments by undertaking cutting edge research in BRs. The Lead Institutions should also help the State Governments in preparing the Annual Plan of Operations. MoEFCC should sanction adequate funds to the Lead Institutions.

Though a significant advancement has been made towards the understanding of the unique concept of Man and Biosphere, still a lot of information to be explored without disturbing the overall activities of natural biome that serve as natural biological laboratories for the benefit of local people, scientists, government, decision makers and the world community.