ACHANAKMAR-AMARKANTAK BIOSPHERE RESERVE UNDER WORLD NETWORK OF BIOSPHERE RESERVES

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INTRODUCTION

- The idea of Biosphere Reserves was mooted by United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1973 under its Man and Biosphere (MAB) programme for "building scientific and technical capacity for effective management and sustainable use of biodiversity".
- Biosphere reserve (BR) is an international designation coined by UNESCO for representative parts of natural and cultural landscapes extending over terrestrial or coastal/marine ecosystems.
- A biosphere reserve is a unique concept that includes one or more protected areas and surrounding lands that manage to combine both conservation, and sustainable use of natural resources.

- The first biosphere reserve of the world was established in 1979, since then the network of biosphere reserves has increased to 580 in 114 countries across the world.
- India launched National Biosphere Reserve Programme in 1979 under Indian MAB.
- The Ministry of Environment and Forest, Government of India, is implementing this programme in the country.
- Currently, there are 18 biosphere reserves operating in India.
- Of these, “Achanakmar-Amarkanatak Biosphere Reserve” is located in the States of Chhattisgarh and Madhya Pradesh, under the jurisdiction of Tropical Forest Research Institute, Jabalpur, a Lead Institute for this biosphere reserve.

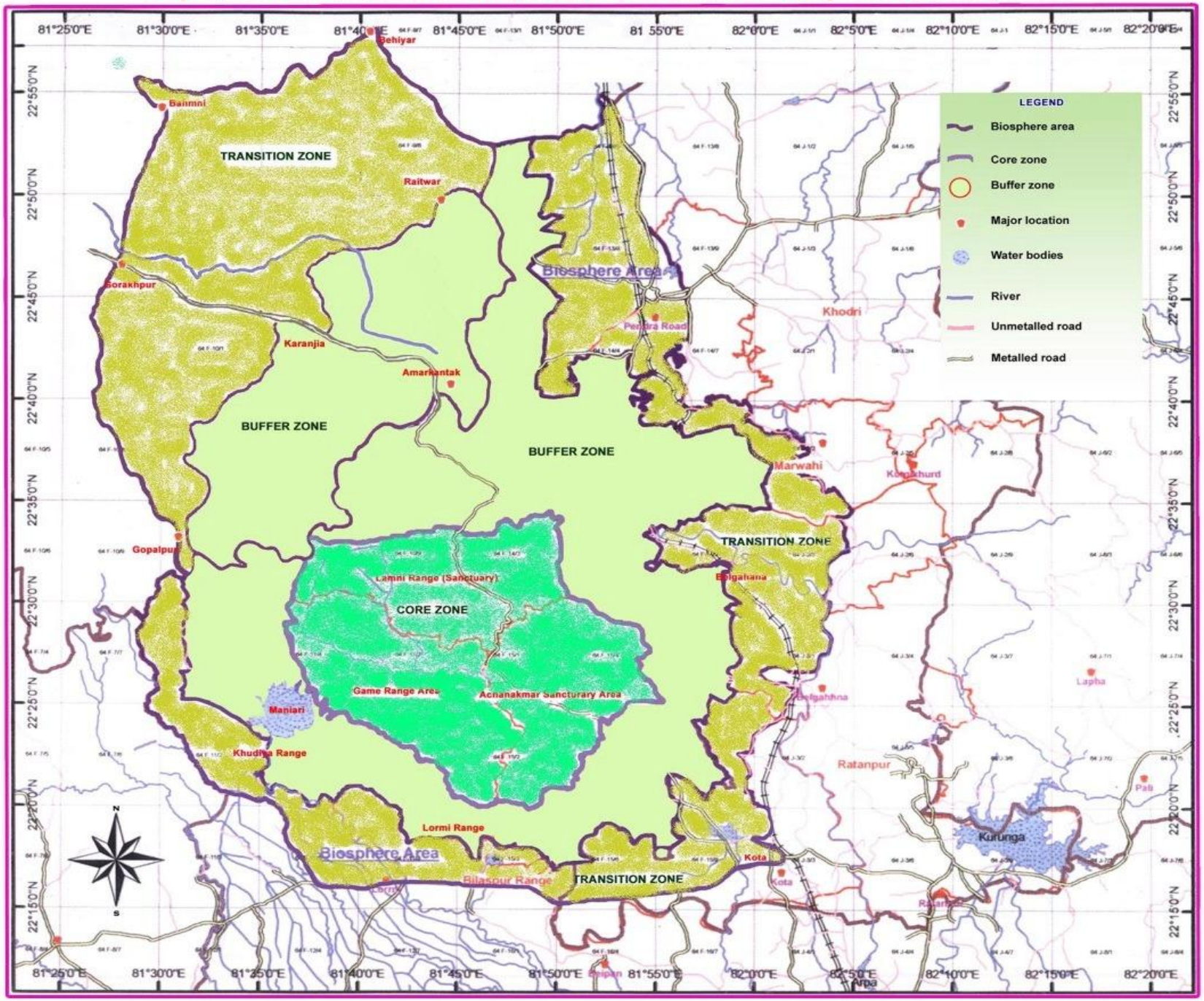
Achanakmar-Amarkantak Biosphere Reserve

- Achanakmar-Amarkantak Biosphere Reserve is the first biosphere reserve of Chhattisgarh State and 14th biosphere reserve of the country, declared by Government of India during the year 2005 (vide No. 9/16/99 CS/BR dated 30th March 2005). It lies between latitude 22^0 15' to 20^0 58' N and longitude 81^0 25'N to 82^0 5'E and is spread from Maikal hill ranges to the junction of Vindhyan and Satpura hill ranges in a triangular shape. Its boundaries start from Kota and Lormi forest ranges of Bilaspur district in (Chhattisgarh) south to Rajendragram forest range of Anuppur district (Madhya Pradesh) in the north and Belgahana forest range of Chhattisgarh in the east to Dindori forest range of Dindori district in Madhya Pradesh. The total geographical area of biosphere reserve is 38,35.51 sq. km (Anon, 2007).

- It consists of three distinct zones, viz. core zone with an area of 551.55 sq. ha. in Chhattisgarh state, buffer zone with an area of 1,95,587.5 sq. ha. in Madhya Pradesh and Chhattisgarh, and outer most transition zone with an area of 132808.5 sq. ha. in both the states. The core zone has 22 villages with a population of 7,709 inhabitants whereas the buffer zone and transition zones have 396 revenue and forest villages in both States with a population of 4,17,571 inhabitants. In all, 27 communities, mostly tribal, scheduled castes and other backward classes, live in the biosphere reserve. The biosphere reserve has three distinct seasons, viz. monsoon, which begins from July and continues up to October; winter from November to February; and summer from March to June. The lowest temperature in winter is 2 ^{o}C, which rises up to a maximum of 46 ^{o}C in June. The humidity varies from 39 % to 90%.


Map showing neighbouring counties and their protected areas around the proposed site
TAJIKISTAN
AFGHANISTAN
PAKISTAN
CHINA
TIBET
NEPAL
BHUTAN
BANGLADESH
SRI LANKA
N
JAMMU & KASHMIR
Dochigam
Hemis High Attitude
Kishtwar
Great Himalayan
HIMACHAL PRADESH
PUNJAB
Abohar
UTTARANCHAL
HARYANA
Corbett
Sultanpur
Dudwa
Tal Chapper
Desert
Sarisha
UTTAR PRADESH
RAJASTHAN
Mount Abu
Rantnambore
Chambal
Nal Sarovar
Wild Ass
GUJRAT
Marine
Gir
DIU
Van Vihar
Madhav
Panna
Bandhavgarh
Kanha
Pench
MADHYA PRADESH
Bansda
Melghat
Tadoba
DADRA & NAGAR HAVELI
Sanjay Gandhi
MAHARASHTRA
Eturnagaram
Dandeli
Anshi
GOA
Kudremuth
Nagarhele
KARNATAKA
Bandipur
Pulicat
Nagarjunasagar
ANDHRA PRADESH
Guindy
Vedantangal
Madumalai
Eravikuram
KERALA
TAMIL NADU
Marine
Periyar
Mundanthurai
Kolleru
Chilika Lake
Ushakothi
CHATTISGARH
ORISSA
Simlipal
Sundar bans
JHARKHAND
WEST BENGAL
BIHAR
Hazaribagh
Gautam Budda
Shilong
MEGHALAYA
TRIPURA
MIZORAM
MANIPUR
Lamjao
NAGALAND
ASSAM
ARUNACHAL PRADESH
Mpling
Namdang
Keibul
SIKKIM
Achanakmar-Amarkantak Biosphere Reserve
Arabian Sea
Bay of Bengal
LAKSHADWEEP (INDIA)
ANDAMAN & NICOBAR ISLAND (INDIA)
Scale 1:34,000,000
Km 0 200 400 600 Km
Protected Areas
I N D I A

Map with the boundaries of Achanakmar -Amarkantak Biosphere Reserve, India



Area

- Spread over- 3835.51 sq km
- Core zone - 551.55 sq km
- Buffer Zone – 1955.87 sq km
- Transition zone- 1328.09 sq km
- Forest constitutes 63.91% of total geographical area.

Floral and faunal attributes

- The forest area is about 63.19% and the vegetation of the Achanakmar-Amarkantak biosphere reserve is tropical deciduous type. The biosphere reserve is very rich with high density of flora and fauna. It comprises of 1527 species of identified flora, 324 species of identified fauna and many more undescribed floral and faunal taxa. Plant species like the lichen, *Caloplaca amarkantakana*, fern, *Isoetes bilaspurensis* and an angiosperm, *Bothrichloa grahamii* are endemic to this region. Twenty eight threatened species of flora and 55 threatened species of fauna belonging to various groups have been identified and grouped into different threat categories regionally as well as globally as per IUCN criteria ver. 2001.

- Besides these, there are 518 floral species of food and medicinal values. Seven of them are pteridophytes whereas remaining 511 species are flowering plants of dicotyledons and monocotyledons (Anon, 2007). Inventory reports on 144 species of grasses belonging to 71 genera, including an endemic species, *Bothriockloa grahamii* (Haines) have been published recently (Anon, 2012). Many forest invasive species like *Lantana*, *Parthenium*, etc. are present in biosphere reserve and invading the forest areas.

- Among fauna, there are two critically endangered species, viz. *Philautus sanctisilvaticus* (Amphibia : Hylidae), *Gyps bengalensis* (Aves : Accipitridae) and two endangered species, viz. *Notopterus chitala* (Pisces : Notopteridae), *Panthera tigris* (Mammalia : Felidae), besides 51 low risk to vulnerable species as per IUCN categorization. The area of the biosphere reserve has a known habitat for animals like tiger, bison, bear, spotted deer, barking deer, panther, wild cat, fox, wild dog, sambhar, four horned antelope, mouse deer, etc (Anon, 2008). It has rugged terrain as well as grasslands giving shelter to wildlife in all seasons. Rich dense forests dominated by sal and its associates give way to high precipitation further enhancing and promoting moist habitat and supported plant diversity.

Vegetation Type

1.Northern Tropical Moist Deciduous

2.Northern Tropical Dry Deciduous

Inhabitants

22 villages in core and 396 villages in buffer and transition zones.

Rural and sub-urban population of inhabitants in-

Core - 7,617 primitive tribe

Buffer & Transition – 4,40,404

Total - 4,48,021 inhabitants of 27 communities in 418 villages.

Depends on Agriculture and partially on BR for fuel, fodder, food, medicine, etc.

Flora

1. Thallophytes- 316
- Algae -7
- Fungi -179
- Lichen -130

2. Bryophytes -44
3. Pteridophytes-40
4. Gymnosperms-16
5. Angiosperms-1111

Endemic- 3

Lichen

Pteridophyte

Angiosperm

Rare- 282 species

Threatened- 40 species

IUCN categorized species

Critically endangered – 01, Endangered – 10, Vulnerable – 19,

Near Threatened - 08




MEDICINAL PLANTS OF ACHANAKMAR-AMARKANTAK BIOSPHERE RESERVE




List of economically important threatened flora in buffer zone

S.N.	Name of species	Common name	Division: Family	Category
1	*Adiantum capillus veneris* L.	Hansraj	Pteridophyta: Adiantaceae	EN
2	*Lygodium flexuosum* (L.) Sw	-	Pteridophyta: Lygodiaceae	EN
3	*Andrographis paniculata* (Burm.f.) Wallich *ex* Nees.	Kalmegh	Angiosperm: Acanthaceae	VU
4	*Peucedanum nagpurense* Prain	Tejraj	Apiaceae	VU
5	*Boswellia serrata* Roxb.	Salai	Burseraceae	VU
6	*Celastrus paniculata* Willd.	Malkangni	Celastraceae	VU
7	*Terminalia chebula* Retz.	Harra	Combretaceae	VU
8	*Phyllanthus emblica* L.	Aonla	Euphorbiaceae	VU
9	*Pterocarpus marsupium* Roxb.	Bija	Fabaceae	VU
10	*Uraria picta* (Jacq.) Desv. ex DC.		Fabaceae	VU
11	*Litsea glutinosa* (Lour.) CR. Robins	Maida	Lauraceae	VU
12	*Plumbago zeylanica* DC.	Chitrak	Plumbaginaceae	VU
13	*Thalictrum foliolosum* DC.	Mameri	Ranunculaceae	VU
14	*Sterculia urens* Roxb.	Kullu	Sterculiaceae	VU
15	*Clerodendrum serratum* (Linn.) Moon.	Bharangi	Verbenaceae	EN
16	*Acorus calamus* L.	Buch	Araceae	EN
17	*Dioscorea bulbifera* Linn.	Ratalu	Dioscoreaceae	VU
18	*D. hispida* Denn.	Karuakanda	Dioscoreaceae	VU
19	*Chlorophytum tuberosum* Baker	Safed musali	Liliaceae	VU
20	*Drimia indica* (Roxb.) I.P. Jessop	Jangali Pyaj	Liliaceae	VU
21	*Gloriosa superba* L.	Kaliyari	Liliaceae	VU
22	*Eulophia herbacea* Linds.		Orchidaceae	EN
23	*Costus speciosus* Sm.	Keokand	Zingiberaceae	VU
24	*Curcuma angustifolia* Roxb.	Tikhur	Zingiberaceae	VU

Fauna

- Invertebrate

Centipedes	- 05
Butterfly	- 49
Moth	- 35
Beetles	- 24
Cricket	- 01

- Vertebrate

Pisces	- 16
Amphibians	- 10
Reptiles	- 15
Birds	- 142
Mammals	- 27

Threatened - 55 species.

IUCN categorized species

Critically endangered – 02

Sacred Grove Bush Frog,

Asian white backed Vulture

Endangered – 02

Chital fish

Tiger

Vulnerable – 14 and Low Risk - 49


Gyps bengalensis(CR)


Bos gaurus gaurus (VU)


Cervus unicolor niger (LR)

Some Threatened fauna


Panthera tigris (EN)


Cuon alpinus (VU)


Presbytis entellus (LR)

Papilio polytes

Precis lemonias

Euploea core

Danias genutia

Apis sp.

Neptis hylas

Occurrence of butterflies in Achanakmar-Amarkantak biosphere reserve

Name of Species	Family	Status	Accession No.
Abisara echerius (Stoll)	Erycinidae	C	419
Badamia exclamationis (Fabr.)	Hesperiidae	C	160
Catopsilia crocale (Cramer)	Pieridae	VC	38
Catopsilia pyranthe pyranthe (Linn.)	Pieridae	VC	346
Danaus genutia (Cramer)	Nymphalidae	VC	295
Euploea core (Cramer)	Danaidae	VC	15
Hypolimnas bolina (Linn.)	Nymphalidae	C	386
Hypolimnas misippus (Linn.)	Nymphalidae	LC	154
Melanitis leda ismene (Cramer)	Satyridae	C	254
Phalantha phalantha (Drury)	Nymphalidae	C	45
Precis lemonias lemonias (Linn.)	Nymphalidae	C	52
Ypthima avanta Moore*	Satyridae	NR	422

*New record. C=Common. VC=Very common. LC=Least concern. NR=Not rare.

Occurrence of moths in Achanakmar- Amarkantak biosphere reserve

Name of Species	Family	Status	Accession No.
Agrotis segetis Hubner*	Noctuidae	C	586
Agrotis ypsilon Rott.*	Noctuidae	C	28
Antheraea mylitta Drury	Saturniidae	C	440a
Antheraea paphia L.	Saturniidae	C	440b
Chaerocampa boerhaviae Fabricius*	Sphingidae	C	454
Creatonotus gangis (L.)*	Arctiidae	C	60
Cyana perigrina Walker*	Arctiidae	C	408
Dasychira mendosa (Hubner)*	Lymantriidae	C	20
Estigena pardalis Walker*	Limacodidae	NR	403
Eusemia adlatatrix Koll.*	Agaristidae	C	388
Gramodes mygdon Cramer*	Noctuidae	NR	566
Hamodes unilinea Swinhoe*	Noctuidae	NR	428
Harse convolvuli Linnaeus*	Sphingidae	C	380
Macroglossum belis Linnaeus*	Sphingidae	NR	694
Metanastria repanda Walker*	Lasiocampidae	C	471
Nephele hespera Fabricius*	Sphingidae	C	484
Nyctipao macrops Linnaeus*	Noctuidae	C	482
Pericallia ricini (Fabricius)*	Arctiidae	C	42
Plusia orichalcea (Fabricius)*	Noctuidae	C	173
Polytela gloriosa Fabricius	Noctuidae	C	349
Psilogramma menephron (Cramer)	Sphingidae	C	450
Remigia archesia Cramer*	Noctuidae	C	379
Semiothisa eleonora Cramer*	Geometridae	NR	491
Spodoptera litura Fabricius*	Noctuidae	C	35

BIO-INDICATOR OF ENVIRONMENT

BIO-INDICATOR OF ENVIRONMENT

Antheraea paphia

Antheraea mylitta

Polytela gloriosa

Pericallia ricini

Remigia archesia

Agrotis ypsilon

Metanastria repanda

Eusemia adlatatrix

Spodoptera litura

Agrotis segetis

Cyana perigrina

Creatonotus gangis

Chaerocampa boerhavia

Hamodes unilinea

Macroglossum belis

Nephele hespera

Psilogramma menephron

Harse convolvuli

- Though a significant progress has been made towards the understanding of biodiversity of Achanakmar-Amarkantak biosphere reserve (Anon, 2007, 2008, 2010, 2012), a lot of information still needs to be explored especially floral and faunal compositions including forest invasive species, without disturbing the overall activities of natural biome that serve as natural biological laboratories for the benefit of local peoples, scientists, government, decision makers and the world community.

Objectives

- Collection, synthesis and dissemination of research based information in respect of biosphere reserve from all sources.
- Interaction with regional research organizations for development of suitable research projects.
- Undertake research and develop data bank.
- Maintain regular interface with biosphere reserve managers to assess the research needs and crucial areas requiring research efforts and providing research inputs for inclusion in Management Action Plans.

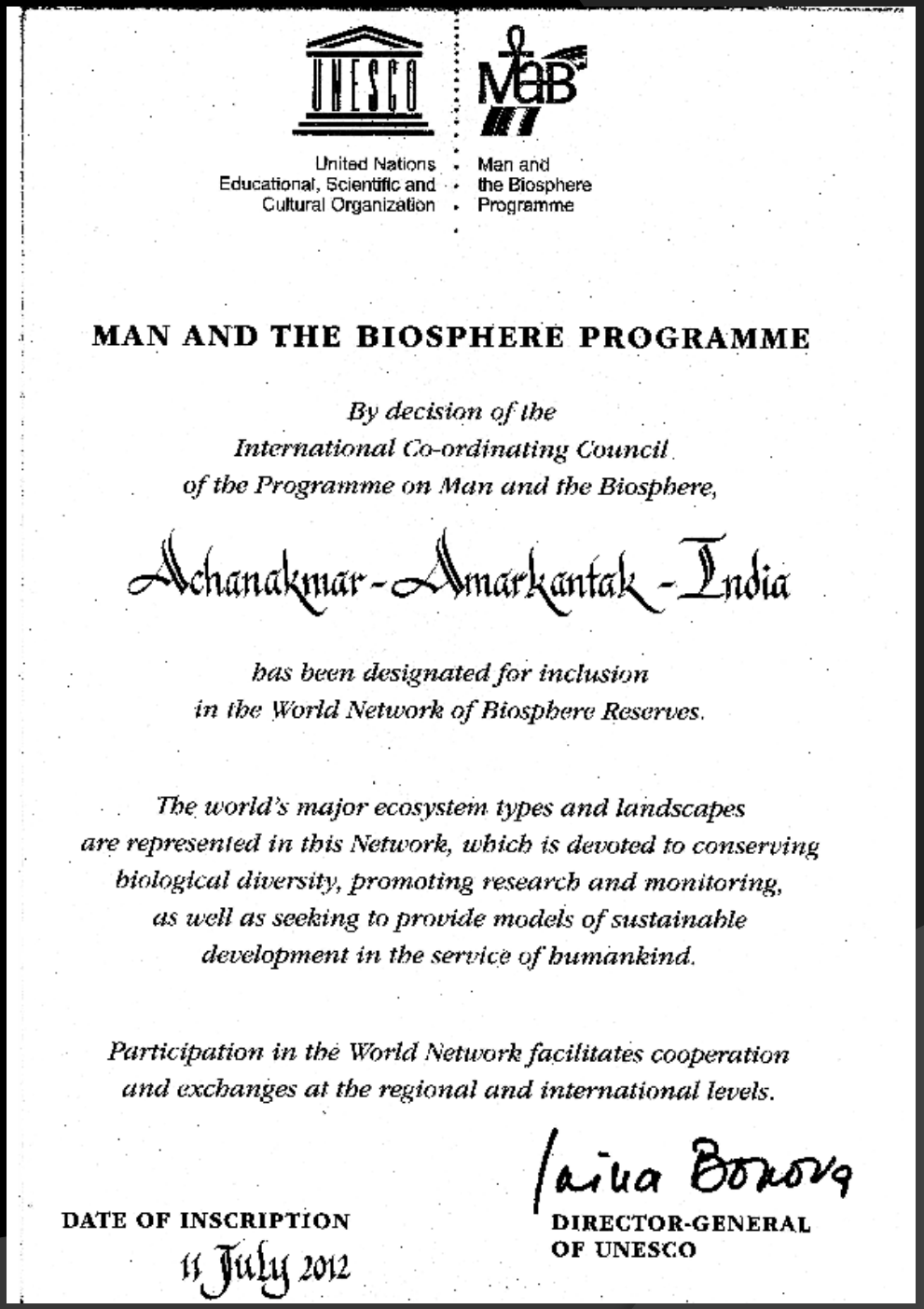
- Publication of a compendium of up to date information and bringing bi-annual publications aimed to educate stakeholders.
- Preparation of project document for designation of new biosphere reserves in coordination with concerned State Government(s).
- Formulation of project proposals for designation of Indian biosphere reserves on World Network of biosphere reserves recognized by UNESCO.
- Any other assignment which may be entrusted by Central/State Govt. to achieve the larger objectives of the scheme.

Achievements

- Collected, synthesised and disseminated research based information in respect of biosphere reserve from all sources.
- Interacted with regional research organizations for development of suitable research projects.
- Undertaken research, established sample plots and developed data bank.
- Maintained regular interface with biosphere reserve managers to assess the research needs and crucial areas requiring research efforts.
- Published compendium and bi-annual publications (BRIS) aimed to educate stakeholders.

- Organised workshop/training programme.
- Created web based information centre on Achanakmar-Amarkantak biosphere reserve and linked to the website of TFRI (http://tfri.icfre.org /AABR/ aabr -INDEX/ index. html).
- Submitted proposals for inclusion of Achanakmar-Amarkantak biosphere reserve on World Network of biosphere reserves recognized by UNESCO.

The International Council of UNESCO's Man and the Biosphere Programme (MAB) meeting in Paris from 9-13 July 2012 declared Achanakmar-Amarkantak Biosphere Reserve under the World Network of Biosphere Reserves (WNBR).



United Nations Educational, Scientific and Cultural Organization

Man and the Biosphere Programme

MAN AND THE BIOSPHERE PROGRAMME

By decision of the International Co-ordinating Council of the Programme on Man and the Biosphere,

Achanakmar - Amarkantak - India

has been designated for inclusion in the World Network of Biosphere Reserves.

The world's major ecosystem types and landscapes are represented in this Network, which is devoted to conserving biological diversity, promoting research and monitoring, as well as seeking to provide models of sustainable development in the service of humankind.

Participation in the World Network facilitates cooperation and exchanges at the regional and international levels.

Irina Bokova

DIRECTOR-GENERAL OF UNESCO

DATE OF INSCRIPTION

11 July 2012

World Network of Biosphere Reserves

- Promotes north- north and south – south cooperation and increases international collaboration through knowledge sharing, exchanging experiences, capacity building and promoting best practices.
- It is an interactive network of sites of excellence and fosters harmonious integration of people and nature for sustainable development in a wide array of context.

- The World Network of Biosphere Reserves of the Man and Biosphere Programme consists of a dynamic and interactive net work of sites of excellence. It fosters integration of people and nature for sustainable development through participatory dialogue, knowledge sharing, poverty reduction and human well-being improvements, respect for cultural values and society's ability to cope with change, thus contributing to the Millennium Development Goals (MDGs).

- With this recognition from UNESCO, the Achanakmar-Amarkantak Biosphere Reserve enters into new realm of developmental activities which will usher in biodiversity conservation and socio-economic improvement of nearby tribals and open-up for international scientific cooperation and funding.

Scope and Challenges

- Documentation of unrecorded species of flora including algae, fungi, pteridophyte and angiosperm including medicinal plants, forest invasive species (FIS) and their status.

- Documentation of unrecorded species of fauna like crustacean, grasshoppers, crickets, beetles, beautiful moths, butterflies, odonata, wasps, termites, spiders and molluscs, fish, amphibians, reptiles, birds and even mammals like bats, flying squirrel, etc.

- Soil and moisture conservation, protecting forest and wildlife.

- To improve living conditions by providing livelihood options through sustainable production, harvesting, processing, marketing of forest produce and pilgrimage /ecotourism.
- To educate the inhabitants about importance of BR and train them in various forest management activities.

APPLICATION FOR GRANT FOR RESEARCH PROJECT

(To be completed by the Principal Investigator)

1. Title of the Project :
2. Name and Designation of the Principal-Investigator :
3. Name and Designation of the Co-Investigator :
4. Postal Address of the Principal Investigator and Co-investigator :
5. Name of the institution/organisation in which the project will be carried out :
6. Name of other institution(s)/ Organisation(s) involved in the project :
7. Duration of the project :
8. Total amount of assistance required :
9. Following documents are enclosed :

Statement I – An abstract, not exceeding one page, describing the back ground, objectives, methodology and figures of year-wise budget.

Statement II - Should contain the following :

- State of Art of the subject including work done in India and elsewhere;
- Detailed literature survey
- Objectives
- Detailed methodology
- Quarter-wise work-plan
- PERT – Chart
- Practical relevance/utility of the project
- Agencies which can utilize the results of the project.

Statement III – giving brief background of the investigator who will carry out the project including papers published in the area of the proposed research project.

Statement IV – indicating facilities (equipment/instrument) available at institution organisation for carrying out the projects.

Statement V – Project budget in the prescribed format.

APPENDIX TO THE APPLICATION FOR GRANT OF RESEARCH PROJECTS

PROJECT BUDGET

A.	**Salaries & Wages :**	**I Year**	**II Year**	**III Year**	**Total**
1.	Investigator				
2.	Research Associate				
3.	SRF/JRF/SPF/JPF				
4.	Supporting technical staff or other personnel, if any				
	Grand total : …….				

* Please specify, the rate of salary and wages per month for each category and also rates of HRA and Medical reimbursement.

B. Permanent Equipment

Grand total: ……

C. Expendables

(Chemicals & Glassware)

D. Travel

E. Other project costs, if any (please specify)

F. Contigencies

G. Institutional charges

(15% of the total Project Cost)

Grand Total : ……

To be submitted to Ministry of Environment and Forests, New Delhi.

Address for correspondence:

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or

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अचानकमार – अमरकंटक बायोस्फियर रिजर्व


Thank you