MANAGEMENT PLAN

For

Shakambhari Conservation Reserve

PLAN PERIOD 2025-26 to 2034-35

Prepared by

Guljari Lal Jat, R.F.S., DCF, Sikar

Under the guidance of

Rajeev Chaturvedi, I.F.S., Chief Conservator of Forests, Jaipur

Shikha Mehra, I.F.S., CWLW, Rajasthan

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Designation : Chief Conservator Of Forest
Date: 2025.06.06 17:25:34 IST
Reason: Approved

RajKaj Ref No.: 15763875

EXECUTIVE SUMMARY

The Forest Department has issued a notification No. P.3 (16) Van/2009 Dated 09.02.2012, declaring a new Conservation Reserve by combining Raghunathgarh Protected Forest Blocks named Shakambhari Conservation Reserve. The land of Protected Forest Raghunathgarh whose total area is 13100 hectares out of which 8070 hectares of Sikar District and 5030 hectares of Jhunjunu District has been declared as Conservation Reserve. 24 Villages adjacent to forest block Raghunathgarh are Raghunathgarh, Piprali, Baral, Gurara etc.
Shakambhari conservation Reserve (27°34'N to 27°43' N & 75°17' E to 75°30' E) is one of the distinguished sacred place of Rajasthan which was formally known as Raghunathgarh Forest. It is 10 km near to NH 52. Total geographical area of the Conservation Reserve is 144.94 square kilometer, out of which 88.62 sq. km lies in Sikar Division and rest 56.32 sq. km lies in Jhunjhunu Division. It is situated 47 km away from the district headquarter Sikar by State highway 37 B and 64 Km far from Jhunjunu district headquarter by State highway 37. Udaipurwati is the nearest town, which is hardly 11 km away in the north-east direction.

As a result of dense plantation, vegetation of good density is present in the Shakambhari Reserve Forest of of Protected Forest Raghunathgarh has been declared as Conservation Reserve., which provides suitable habitat for 200-225 species of birds along with Sambhar, Porcupine, Fox, Wild cat, Hyena, and Panther., Snake, Frog and Toad as well as many types of lizards. The intention behind the creation of the Shakambhari Conservation Reserve is to preserve a representative sample of the hilly area ecosystem for the benefit of future generations. The main intension is to protect flora & fauna present in this area specially Dhonk, Kumtha& creation of habitat for Panther. The idea was also to protect hilly area eco-system in its natural form for times to come. This Management Plan has been prepared to fulfill the objectives envisioned while creation of this Conservation Reserve. All the measures have been adopted to retain the unique characteristics of the hilly area intact.

The commonly adopted pattern of Management Plan is followed in this plan as well. In addition, few chapters have been included that are unique to this plan. The chapter; Closure History has been prepared similar to the Compartment History of Working Plans. There are nine high protection closures created for securing the habitats of Panther. Active management of the administration is concentrated in and around these closures. The historical details in GT Map, Google Map of each closure and its proposed management are detailed in this chapter called Closure History.

In order to ensure continuity in management especially in the fields that require technical knowhow, Standard Operations Procedures have been prepared. This chapter has outlined the procedure to be adhered to while carrying out the various Annual operations of the Conservation Reserve.

A chapter on Basic Development Plan has been prepared to provide the [illegible] city people trapped around the Conservation Reserve with basic living conditions include electricity, health and education services.

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Acknowledgement

We are privileged to have this opportunity of working in the Shakambhari Conservation Reserve among the beautiful forest patches and local communities of Shakambhari Conservation Reserve (SCR). The preparation of the management plan has been an immense learning experience as the process of planning involved interactions with the local Panchayats of this CR, communities of the village and officials & staff of Forest Department. Discussions with different stakeholders was another dimension of learning since the land use of the area is complex and different departments have their unique responsibilities in managing different attributes of the landscape.

With increasing role of nature education and awareness creation among the public, Shakambhari Conservation Reserve has a crucial role to play in developing an eco-conscious new generation and protecting the hilly terrain land. It is this backdrop that this management plan has been developed. Many people from various capacities have contributed in preparation of this document by means of ideas and words.

The understanding of roles of major stakeholders of SCR gave us major insights about how the management planning has to be undertaken to secure the integrity of this ecosystem. This management plan is the outcome of efforts of a number of individuals. We would like to acknowledge our sincere gratitude to the following:

Forest Department:

We sincerely thank Smt. Shikha Mehra, Principal Conservator of Forests and Chief Wildlife Warden, Rajasthan for her guidance and suggestions that helped in improving this plan. PCCF (Working Plan) gave very valuable suggestions in giving final shape to the draft and interpretation of various judgements of Hon'ble Supreme Court for which we are grateful.; We thank Shri Rajesh Gupta, Addl. Principal Conservator of Forests, Wildlife for being the guiding throughout the preparation of this plan. Shri Rajeev Chaturvedi, Chief Conservator of Forests IFS, CCF, Jaipur for his guidance, valuable suggestions and critical comments in finalizing the plan.

We are grateful to ACF Sikar & RFO Sikar, Srimadhopur and Jhunjhunu for surveys and other documents used in this plan. Along with the other office personals and field staff of the Shakambhari Conservation Reserve deserve special acknowledgement for their help in the collection and compilation of the information on the Conservation Reserve.

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Stakeholders of SCR:

Stakeholders for forest conservation include:
Governments: Ministries and agencies that manage forests, land, and water resources
Private sector: Companies that operate within or outside the forest landscape, and engage in the supply chains of forest-related products and services
Local people: Panchayat Pradhan; Panchayat Members; members of Self-Help Groups and residents of village of Raghunathgarh, Piprali, Baral, Gurara etc. who live around the forest and depend on its resources for sustenance.
Industrialists: Use forest products as raw materials for production
Conservationists: Enthusiasts for the conservation of wildlife and nature, Research Fellow;

Last but not the least, I would like to thanks Shri Dadu PariyavaranSansthan, for their active discussions during problem analysis, objective setting and strategy formulation of the plan as well the designing, formatting and writing of this document.

Deputy Conservator of Forests
Sikar

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Shakambhari Conservation Reserve, Sikar
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3. Annexure: III Notification	
4. Annexure: IV Area Statement	

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PREAMBLE

This management plan has been prepared for the Shakambhari Conservation Reserve. The management plan is an overall monitoring tool, which is to be applied by the managers to ensure that the ecological integrity of the Conservation Reserve is preserved and that the balance between protection and wise use of resources is reasonable. It puts together the history and present management practices of the Conservation Reserve and future plans for improvement. It ensures continuity in the management of the Protected Area by prescribing goals to be accomplished and means of achieving them.

This management plan is for the period 2025-26 to 2034-35 and it prescribes the management strategies to be adopted for protection, maintenance and improvement of the unique ecological elements of Conservation Reserve for posterity. The prescriptions are based on the scientific analysis of field data, logical interpretation of the results, discussions with Stakeholders, field staff and academicians.

All existing guidelines for the preparation of a management plan have been incorporated to the best possible extent. Since the policies and priorities of management have undergo changes

with time, periodic review of this plan is proposed after five years.

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LIST OF ABBREVIATIONS

ACF	Assistant Conservator of Forests
APCCF	Additional Principal Chief Conservator of Forests
APO	Annual Plan of Operation
BCR	Shakambhari Conservation Reserve
BNHS	Bombay Natural History Society
BSR	Basic Shedule of Rates
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CCF	Chief Conservator of Forests
CDH	Conservation Development and Harvest
CR	Conservation Reserve
CR	Community Reserve
CRPC	Code of Criminal Procedure
CSS	Centrally Sponsored Schemes
CUG	Common User Group
CWLW	Chief Wild Life Warden
CWLW	Chief Wildlife Warden
DCF	Deputy Conservator of Forests
DFO	Divisional Forest Officer
DS	Deciduous
EDC	Ecological Development Committee
EDC	Eco-Development Committee
FCC	False Colour Composition
GPS	Global Positioning System
HA.	Hectare
HWC	Human Wildlife Conflict
IPC	Indian Penal Code
IUCN	International Union for Conservation of Nature and Natural Resources
IVRI	Indian Veterinary Research Institute
KADP	Kandi Area Development Project
LULC	Land Use Land Cover
MDR	Major District Road
NCR	National Capital Region
NGI	Non-Governmental Individual
NGO	Non Government Organization
NTFP	Non Timber Forest Produce
OBC	Other Backward Caste
PA	Protected Area
PIT	Passive Integrated Transponder
PRA	Participatory Rural Appraisal
PSC	Planning Sub Committee
PSCT	Punjab Shivalik Conservation Trust
RCC	Reinforced Cement Concrete
RFO	Range Forest Officer
RH	Relative Humidity

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SC	Scheduled Caste
SHG	Self Help Group
SOP	Standard Operation Procedure
SWOT	Strengths Weaknesses Opportunities and Threats
TESSA	Toolkit for Ecosystem Service Site-based Assessment
VFPMC	Village Forest Protection and Management Committee
WHS	Water Harvesting Structure
WII	Wildlife Institute of India
WWF	World Wide Fund

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Chapter 1

Introduction and Background Information

1.1 Name and Status of Constitution/Notification

1.1.1. Name

This plan is proposed for the "Shakambhari Conservation Reserve", Sikar Rajasthan, notified vide notification P.3 (16) Van/2009 Dated 09.02.2012, the land of Protected Forest Raghunathgarh whose total area is 13100 hectares out of which 8070 hectares of Sikar District and 5030 hectares of Jhunjunu District has been declared as Conservation Reserve. 24 Villages adjacent to forest block Raghunathgarh are Raghunathgarh, Piprali, Baral, Gurara etc.

1.1.2. Constitution

As a result of dense plantation, vegetation of good density is present in the Shakambhari Reserve Forest of of Protected Forest Raghunathgarh whose total area is 13100 hectares out of which 8070 hectares of Sikar District and 5030 hectares of Jhunjunu District has been declared as Conservation Reserve., which provides suitable habitat for 200-225 species of birds along with Sambhar, Porcupine, Fox, Wild cat, Hyena, and Panther, Snake, Frog and Toad as well as many types of lizards. Proposals for this have been sent to the State Government under the provisions of Section 36A of Wild Life (Protection) Act 1972. As per State Government notification P.3 (16) Van/2009 Dated 09.02.2012, the land of Shakambhari whose total area is 13100 hectares that has been declared as Conservation Reserve.

1.2 Map of Conservation Reserve

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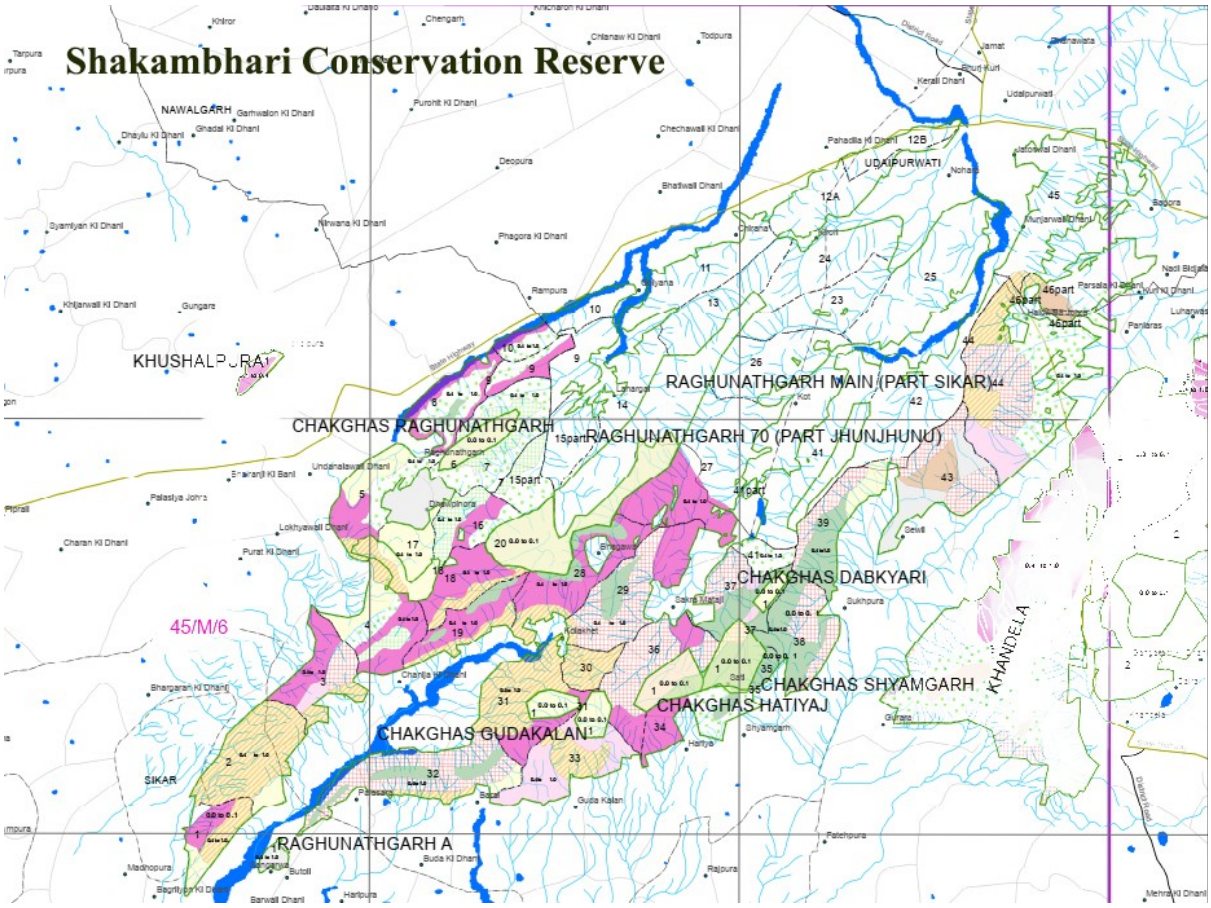

1.3 Location, Physical Boundaries and Extent

Location

Shakambhari conservation Reserve (27°34'N to 27°43' N & 75°17' E to 75°30' E) is one of the distinguished sacred place of Rajasthan which was formally known as Raghunathgarh Forest. It is 10 km near to NH 52. Total geographical area of the Conservation Reserve is 144.94 square kilometer, out of which 88.62 sq. km lies in Sikar Division and rest 56.32sq. km lies in Jhunjhunu Division.It is situated 47 km away from the district headquarter Sikar by State highway 37 B and 64 Km far from Jhunjunu district headquarter by State highway 37. Udaipurwati is the nearest town, which is hardly 11 km away in the north-east direction.

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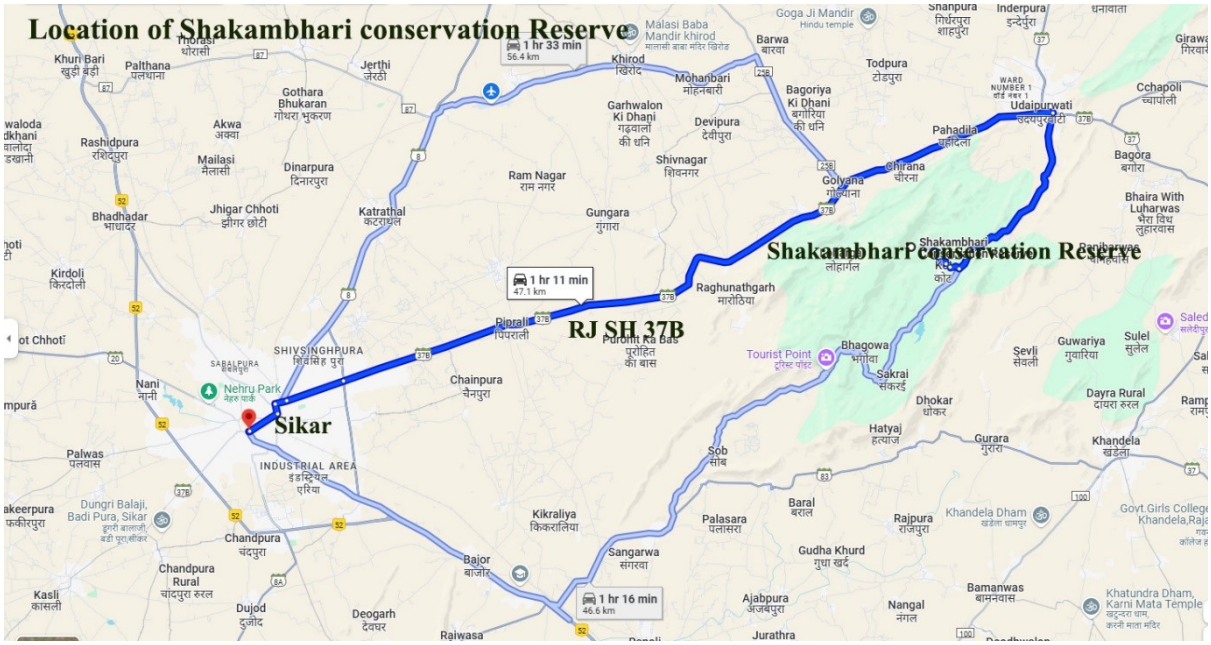

Location map of Shakambhari CR

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Boundaries of the reserve are as follows:-

The Forest Department has included the forest land of Raghunathgarh Main Protected Forest. The department has named it ShakambhariConservation Reserve. Its northern boundary will be the northern boundary Raghunathgarh Main Protected Forest. The southern boundary will be the southern boundary Raghunathgarh Main Protected Forest. The eastern boundary will be the eastern boundary Raghunathgarh Main Protected Forestand the western boundary will be the western boundary Raghunathgarh Main Protected Forest.

Northern Boundary –Northern Boundary of Raghunathgarh Main Protected Forest
Southern Boundary -Southern Boundary of Raghunathgarh Main Protected Forest
Eastern Boundary - Eastern Boundary of Raghunathgarh Main Protected Forest
Western Boundary -Western Boundary of Raghunathgarh Main Protected Forest

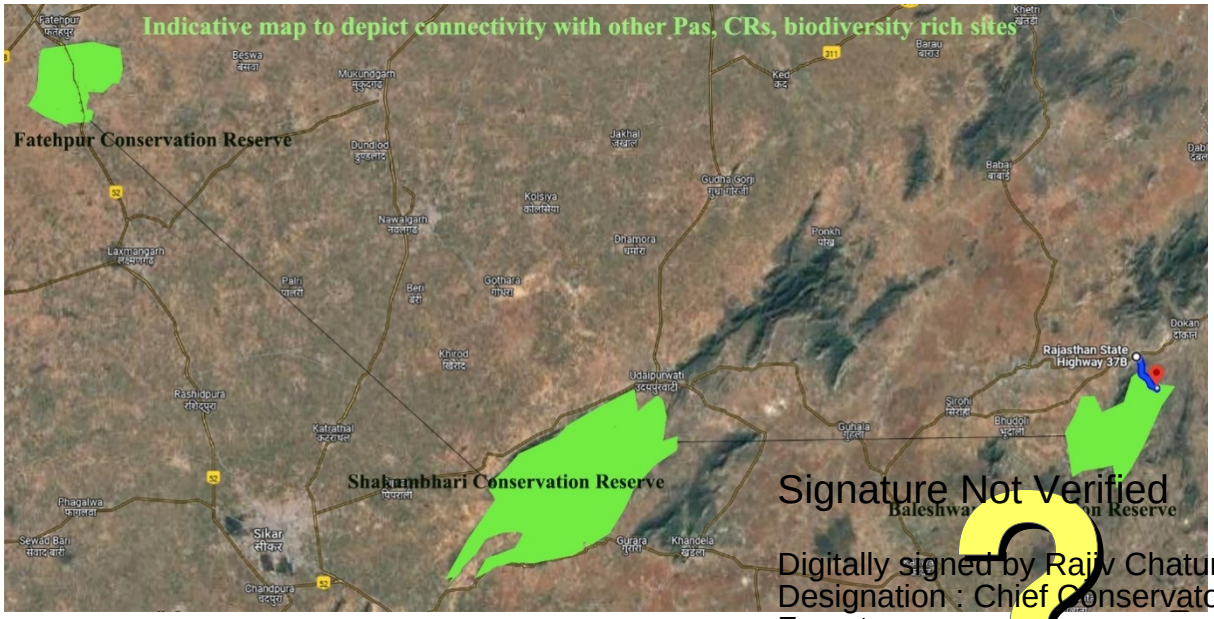
The legal status of the area is Protected Forests and is characterized by Reserve is undulating broken ranges of hills of height ranging from 25 to 150 meters.

1.1.4. Extent

Area of Shakambhari Conservation Reserve (SCR) is 13100 hectares out of which 8070 hectares of Sikar District and 5030 hectares of Jhunjunu District.

1.4 Indicative map to depict connectivity with other PAs, CRs, biodiversity rich sites

This Reserve can be approached by road, is located at 10 km from NH 52. The SikarConservation Reserve Sikar and Shakambhari Conservation Reserve are near about Conservation Reserves. They are adjoininmg biodiversity rich sites.



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1.5. STATEMENT OF SIGNIFICANCE

1.5.1. Unique habitat values

The landscape is characterised by hilly terrain with scattered trees of *Anogeisuss pendula* (Dhonk), *Boswellia serrata* (Salar), *Prosopis juliflora* (Vilayatibabool) and *Acacia senegal* (Kumta) and undulating flat areas of grass lands.

1.5.2. Unique biodiversity values

During the present time, the rapid destruction of natural ecosystem is the most serious threat for the survival of plants and other natural resources. Many activities of human societies are responsible for the degradation of the environment. Our use of natural resources has grown dramatically, particularly since the mid-20thcentury, so that we are endangering the key environmental systems we rely upon. Threats to the species are principally due to a decline in the areas and quality of their habitats.

Loss of biodiversity may trigger large unpredictable change in an ecosystem. It is mainly due to habitat destruction, over exploitation of biological resources, pollution and introduction of exotic plants and animals. There are other reasons also for significant depletion of biodiversity. Prominent among them are the expansion of agriculture and industries, urbanization, road construction and largescale developmental projects. Excessive and uncontrolled biotic interferences also resulted in depletion of biodiversity. It has been estimated that 140 species of plants, animalsand microbes are lost every day from earth. Rapid destruction offorest is the main cause for loss of biodiversity on land.

The world conservation strategy (IUCN, UNEP and WWF) defines conservation as "the management of human use of biodiversity so that it may yield the greatest sustainable benefit to present generation while maintaining its potential to meet the needs and aspirations of future generations." The above definition invokes two complementary components "Conservation and Sustainability". The creation of protected area network helps to reduce biodiversity loss and provides significant contributions to global conservation efforts.

1. Unique Flora

According to Champion and Seth (1968) classification, the vegetation falls under Tropical Dry Decidous Forests, Northern Tropical Dry Decidous Forest, Dry Deciduous Scrub Forests, Desert Thorn Forests, Desert Dune Forests, Tropical Thorn Forests. Most of the undisturbed areas are covered by Dhonk, Salar, Kumta, Khejdi (*Prosopis cineraria*), Babul (*Acacia nilotica*), Guggal (Commiphora spp) and Khirni (*Wrightia tinctoria*). 21 species of mammals, 200 Birds, 29 species of reptiles and 4 species of amphibian are found in this Reserve.

The vegetation is primarily xerophytic, adapted to conserve water. Species like *Prosopis cineraria* (Khejri), *Tecomella undulata* (Rohida), and *Salvadora persica* (Arak bush tree) are iconic. Grasses such as Cenchrus ciliaris and Lasiurus sindicus play crucial role in stabilizing sand dunes and providing fodder.

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2. Endemic and Rare Fauna

Mammals: Home to species like the Indian desert fox, chinkara (Indian gazelle), and caracal, which are specifically adapted to the arid ecosystem.
Birds: A vital habitat for globally significant bird species.
Reptiles: Hosts unique reptiles like the spiny-tailed lizard and desert monitor lizard.
Insects and Arthropods: The desert harbors numerous specialized insects, including endemic species of beetles and scorpions.

3. Migratory and Breeding Grounds

The SCR is a stopover for migratory birds such as cranes, it attract a wide variety of avian species.

4. Adaptations for Survival

Wildlife in the SCR demonstrates fascinating adaptations, such as burrowing behavior (e.g., gerbils) and water storage mechanisms in plants like succulents.

5. Ecosystem Services

The vegetation and wildlife in the SCR help stabilize sand dunes, prevent desertification, and support human livelihoods through grazing and traditional medicine. Pollinators like bees and butterflies thrive on the desert flora, maintaining ecological balance.

6. Cultural and Economic Value

Sacred groves and trees like the Khejri are deeply rooted in local traditions and are often protected by the community. Certain plant species play crucial roles in sustaining traditional livelihoods in the desert.

7. Role in Global Biodiversity

Despite its aridness, the SCR is a mosaic of habitats that support species typically found in both desert and non-desert ecosystems, making it a transition zone of unique biodiversity significance.

1.5.3. Demographic uniqueness

The distribution of population and vegetation status are influenced by the climatic factors like rainfall, temperatures, relative humidity, winds, soil, water resources which are directly or indirectly related with the vegetation status. Many other factors like dryness in the air, seasonal changes and seasonal influences, distribution of sand dunes topography prevailing of hot winds during summer season also influences the vegetation status. [illegible] see the impact on population vegetation status in different points like population density, population literacy and occupational structure of population. As per available of census records (2011)

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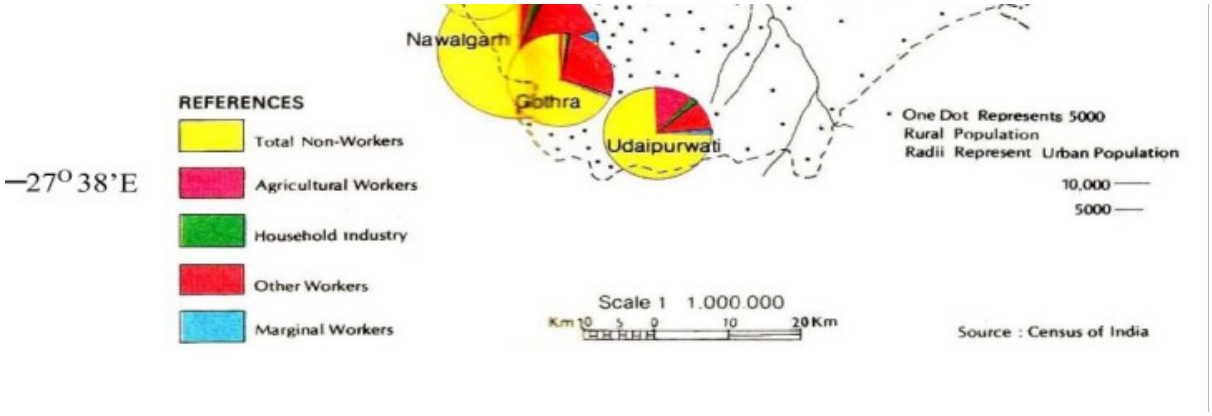
the observations in this aspect revealed some interesting facts which are being discussed here. The distrct's overall population (2137045 persons). The district covers (1716906 persons) rural population and (420139 persons) of urban.

	Area	Male	Female	Total
Udaipurwati	Rural	135830	129704	265534
	Urban	15208	14028	29236
	Total	151038	143732	294770



DISTRIBUTION OF POPULATION DENSITY OF UDAIPURWATI, 2011

		Area	Male	Female	Total	Density
Udaipurwati	Rural	811.75	135830	129704	265534	327
	Urban	35.00	15208	14028	29236	835
	Total	846.75	151038	143732	294770	348

POPULATION BY SEX-RATIO

In any discussion on population, an inquiry in to the proportion of men to women is always an essential and relevant one. We no longer argue whether one sex is superior to the other. But are the males and females equal in number? It is an important question. If men are in excess, some will not get partners and in certain societies the bride price will go up. Truly speaking, the equality in number of males and females in all countries and at all times is an ideal seldom attained. Even if an equal number of male and female babies are born, their chances of survival at various ages are very unequal. In fact there has been a fall in sex ratio. Though the results are provisional yet there is a need for further examination about the declining trend in sex-ratio over the years. Studies made so far have cited several explanations for this phenomenon in the past. Some of then are a preference for male children resulting in neglect of female babies causing higher mortality rate among female, sex ratio at birth favourable to males, longer in migration of males in search of work, the neglect of

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females at all ages-right from birth to death may be responsible for high mortality rates among females etc.

DISTRIBUTION OF SEX RATIO OF UDAIPURWATI, 2011

Udaipurwati	Rural	135830	129704	265534	955
	Urban	15208	14028	29236	922
	Total	151038	143732	294770	952

LITERACY ASPECT:

One of the important characteristics of the population on which information is obtained in the 2011 census is literacy. For the purpose of census, a person is deemed as literate if he or she can read and write with understanding in any language. A person who can merely read but cannot write is not considered literate. In the last few censuses of India, children below five years of age were treated as illiterates, however, in the 1991 census. The question on literacy was asked only to population aged seven years and above.

Literacy Type	**2001**	**2011**
Total Literacy (in percentage)	73-04	74-72
Male Literacy (in percentage)	86-09	87-8
Female Literacy (in percentage)	59-51	61-5
Total Literacy (in numbers)	1152872	1385546
Male Literacy (in numbers)	691728	827466
Female Literacy (in numbers)	461144	558080

WORKING FORCE AND OCCUOPATIUON PATTERN:

Human resources are that basic input for managing the exitingand future Industrial development of an area. According to thepopulation Census 2011 the total working force in the districtpopulation was at 1320724 persons representing about 26percent of the total population. Out of the working force,68 percent is engaged in agriculturesector and 3 percent inhousehold industry and remaining 29 percent in other jobs. Thetotal working force in the district is estimated to be894649 innumbers the occupational distribution of working force as per2011 Economics & Statistics Department, Jaipur has beenfound as given below :-

		Main Worker			**Marginal Worker**			**Non Working population**		
		Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Udaipurwati	Rural	67330	46127	113457	13857	31720	45577	68500	83577	152077
	Urban	6889	1548	8437	565	688	1253	831	12	20769
	Total	74219	47675	121894	14422	32408	46830	76818	027	172845

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1.5.4. Tourism Importance

This area is very important from the tourism point of view. Shakambhari Conservation Reserve is becoming a tourism destination. The reserve is home to a variety of wildlife, including sambhar, porcupine, fox, wild cat, and hyena. Responsible wildlife tourism can help protect the planet's ecosystems and benefit local economies. Visitors can enjoy hiking and walking in the reserve. The Rajasthan Assembly's 2023 budget declared plans to develop the area as a tourism spot.

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Chapter 2
Profile

2.1 General Information

Shakambhari is situated in SikarTehsil of Sikar district. It is situated 50 km away from the district headquarter Sikar. Shakambhari comes under SikarAssembly and Jhunjhunu Parliamentary constituency. Shakambhari is the nearest city to Fatehpur. Forest block Shakambhari was notified in the gazette as **F-7(52)R.A. 64 DATED 13.04.1964** whose total area is 13100.00 hectares which is a protected forest area.

NH 52 passes through forest block Shakambhari whose length is approximately 7 km due to which Shakambhari is divided into almost 2 parts.
7 Railway line passes through forest block Beed whose length is approximately 6 km. 8. In Shakambhari, between NH 52 Harsawa to Sikarcity and railway line Harsawa to Sikarcity, about 235 hectares of land is with the Animal Husbandry Department and about 45 hectares of land is with the "Agriculture Research Center and Institution" and about 115 hectares of land in the east direction of the railway line is with the "Agriculture University".

BOUNDARIES

The Forest Department has included the forest land of Shakambhari, patwarhalka Garinda. The department has named it Shakambhari Conservation Reserve. Its northern boundary will be the northern boundary Khasra number as per notification. The southern boundary will be the southern boundary Khasra number as per notification. The eastern boundary will be the eastern boundary Khasra number as per notification and the western boundary will be the western boundary Khasra number as per notification of Forest Block .

Northern Boundary -Khasra number as per notification
Southern Boundary -Khasra number as per notification
Eastern Boundary -Khasra number as per notification
Western Boundary -Khasra number as per notification

2.2 Current Land Uses/Activities in the Area

Land-Use Pattern
Sikar district provides the livelihood to maximum number of people in the district. To assess itsindustrial potential, it would be worthwhile to explore the land-use pattern, irrigation facilities, crops, livestock, dairy, cattle development, etc. This will provide a broad spectrum of resources inventoryand resource base on which foundation of industrial growth are generally laid down.

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Classification of Land Use for Sikar District

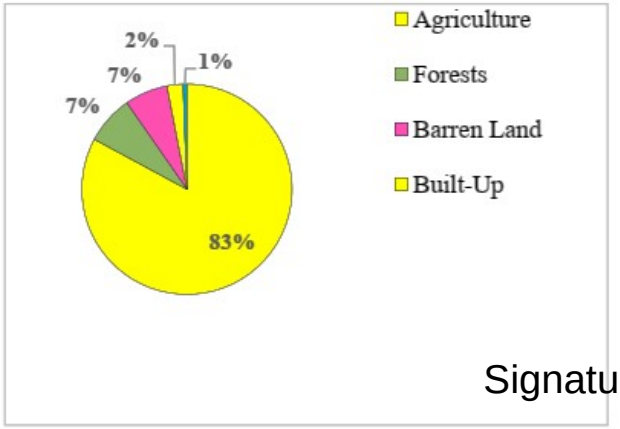
S.No.	Classification	Area in Hectare
01.	Forest	63951.922
02.	Land put to non-agriculture	52864
03.	Other uncultivated a) permanent pastures b) land under miscellaneous tree crop	 40529 88
04.	Culturable waste fallow land	9581
05.	Net area sown	522857
06	Total geographical area	774244
07.	Double cropped area	220109
	Total Cropped area	1684040

Land use Pattern in Raghunathgarh, Sikar District (2013-14)

				Area Under Agriculture (Ha)						
S. No.	Name of the Block	Name of the Villages Covered	Total Geographical Area (ha)	Gross Cropped (ha)	Net Sown (ha)	Area Sown more than once	Cropping Intensity	Area Under Forest	Area Under Waste Land	Area Under Other Uses
1	Sikar	127	1,07,070	67,022	65,155	1,867	103	4,616	27,594	9,705

Land Utilization Pattern

Land form, slope, soil types/textures/structures and availability of natural resources are the important factors whichdirect the land utilization pattern of a settlement. The most dominant land use in district is agriculture which encompasses 83 percent (6928.83 sq.km.) of TGA. Sub-class cropland is most dominant inagriculture class and it covers approximately 3580.73 sq. km. of TGA as represented in (ISRO, 2020)



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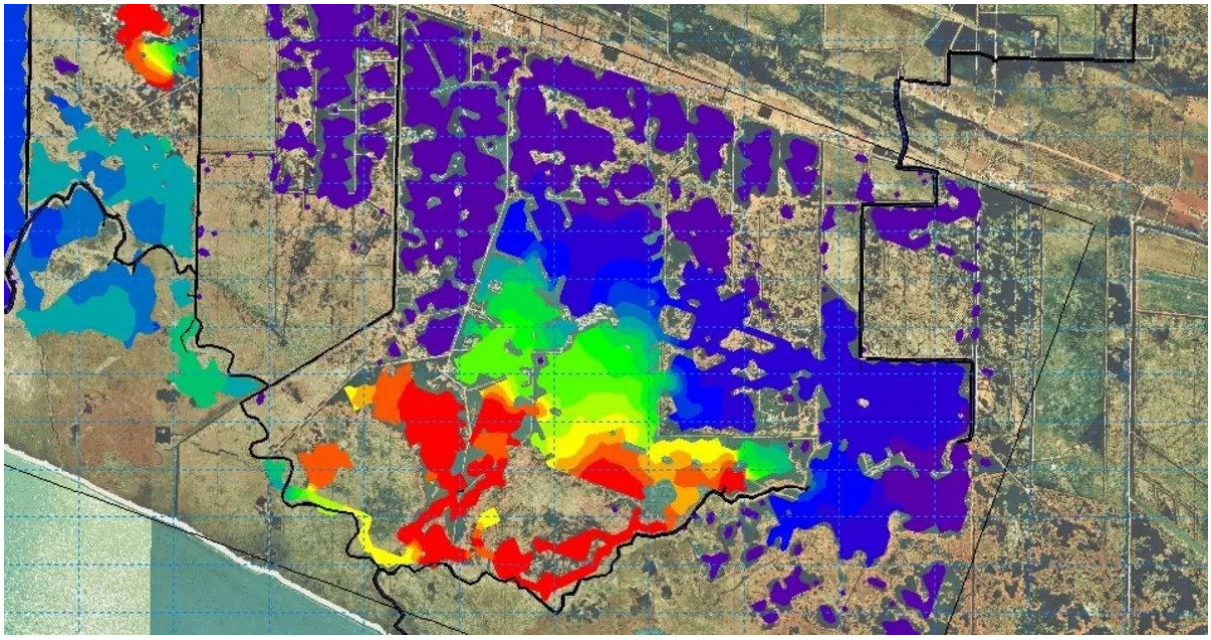
With significant differences in percentage, forest class stands second after agriculture and it encompasses approximately 624.27 Sq. Km. Barren land and Built-up classes of land use cover 553.84 Sq. Km and 204.8 Sq. Km. In built-up class, rural sub-class is the most prominent in the district with approximately 70% (142.61 Sq. Km) of total built-up area. Only 1% of TGA is comprised of water bodies and wetlands.

Land Use Classes / Year	**2005-06**	**2011-12**	**2015-16**
Agriculture	6926.64	6299.59	6928.86
Barren	827.84	554.9	553.84
Built-Up	156.71	202.75	204.88
Forests	672.64	625.25	624.27
Water-Bodies	45.09	49.18	50



Land Use Mapping

2.3 TERRAIN CHARACTERISTICS

TOPOGRAPHY

2.3.1 Landforms:

The northern and western parts are situated in the Thar Desert and are completely desert. The eastern part is semi-desert as well as hilly area. The plain area is mainly the south-eastern part. This area lacks rivers flowing throughout the year.

Most of the area is desert and semi-desert where the main source of water is underground water. In the plains, irrigation is done from underground water only. There is no lake or pond

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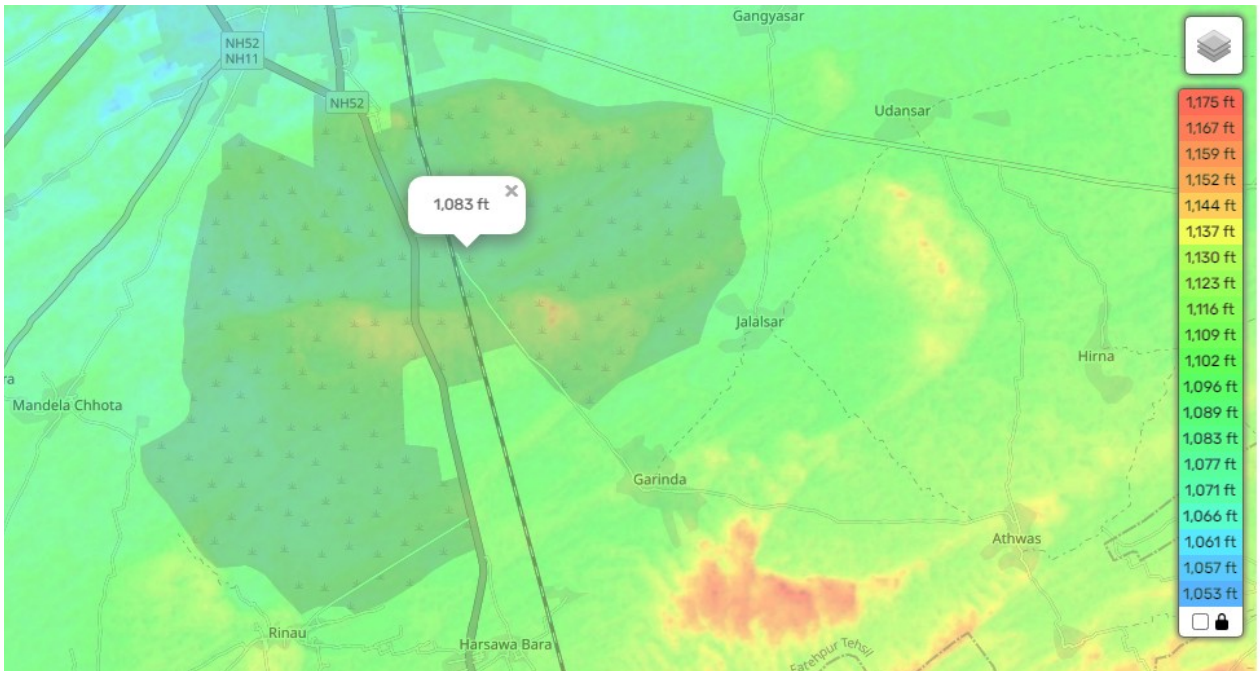
in the district for continuous availability of water. Since the recharge of water sources depends only on rain water. Therefore, the water level goes down in summer and the level of wells is gradually returning to normal level and going down every year.
Due to uncontrolled drainage of rain water, very deep ditches and lanes are formed on the sides of drains. Due to which large caves have been formed at many places. Due to soil erosion due to high velocity of water, trees get uprooted. Due to soil erosion, local farmers and their fields are also in danger and farmers are also promoting this erosion further by not using agricultural methods on the principle of watershed development.



The general shape of a district is of an irregular crescent or a bowl. Its southern portion comprise Danta Ramgarh and Sri Madhapur tehsil, which make an inward curve and protrude slightly inside the district. The district can be divided into two distinct physiographic units, viz. sandy plains in the west and theeastern half, NE-SW trending hill ranges. The major river of the district is Kantli and Mendha. Significant part of the district falls within 'Outside Basin' which does not have a systematic drainage system. The general topographic elevation in the district ranges between 375 m to 500 m above meansea level in the district. Elevation ranges from a minimum of 294 m amsl in Sikarblock in the NW part of the district to a maximum of 1,032 m amsl in Piprali block in northern part of the district.

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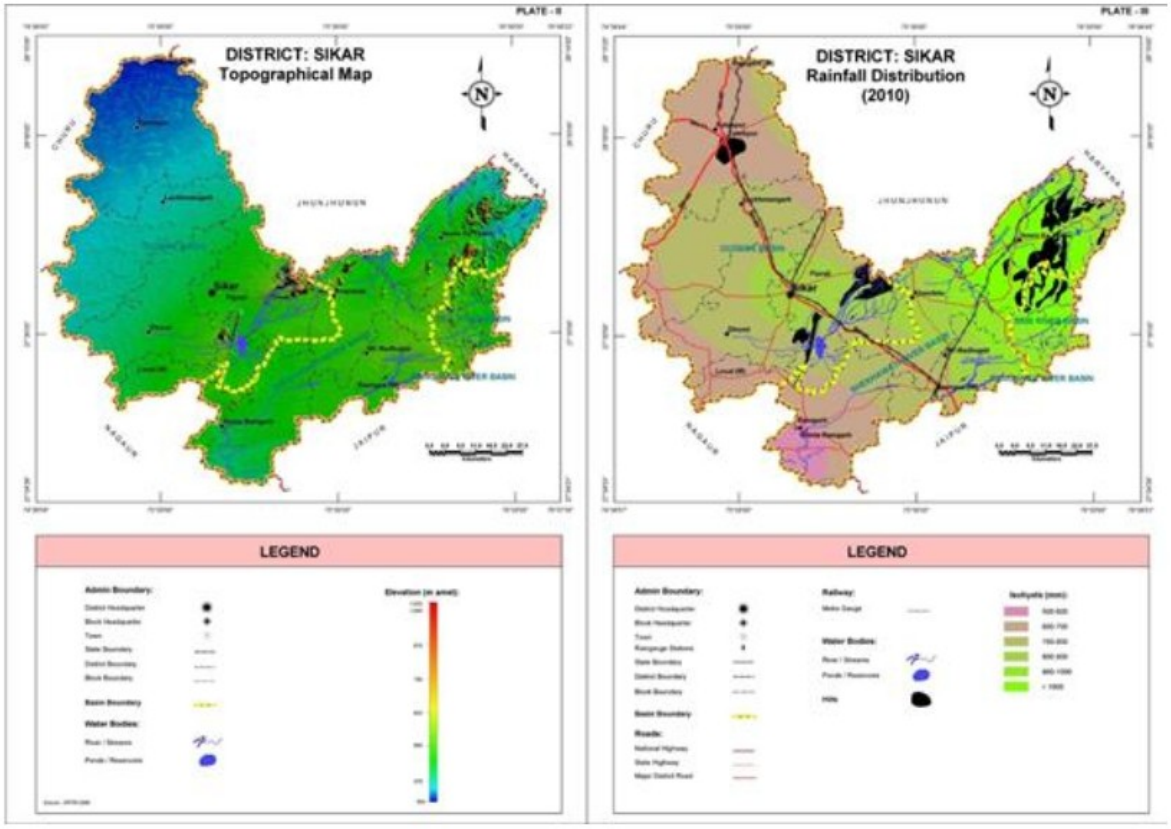
S.no	Block name	Minimum Elevation (m amsl)	Maximum Elevation (m amsl)
1	Danta Ramgarh	375.1	641.7
2	Dhond	358.9	901.3
3	Sikar	294.0	374.3
4	Khandela	419.4	899.1
5	Laxmangarh	332.7	408.2
6	Neem ka thana	333.2	825.4
7	Piprali	392.9	1032.0
8	Srimadhopur	450.0	716.1

Block wise elevation (Maximum and Minimum)



Topological map and Rainfall Distribution map of Sikar District

2.3.2. Geology, Rocks and Soil:

2.3.2.1 Geology and Rocks:

The Aravalli and Pre Aravalli rock systems in the region are one of the oldest systems. Which is 2500 crore years old. The Delhi system and post Delhi syst[illegible]mainly as follows-

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S. No.	System series	Types of rocks
1	New and sub-new	Layers of Alluvium, Aeolian sand
2	Post Delhi	Granite, Amphibolite, Pegmatite
3	Delhi mountain range Ajabgarh	Phyllite, Marble, Quartzite
4	Pre-Aravalli and Aravalli mountain range Alwar	granite, gneiss, schist, magmatite

The Aravalli range extending from north-east to south-west direction in Rajasthan is considered to be the oldest folded range of the world which still exists in the form of ranges. This mountain range was mostly levelled during the Paleozoic period, and later restored during the Mesozoic period and the effect of this uplift is manifest in exceptionally sharp local bends and faults along the Great Boundary Fault, which is traced for about 480 km.

Across the Aravalli range, great variations are observed in the degree of metamorphism of the three systems which constitute the Aravallis, namely the Aravallis, the Rhyolas and the Delhi. The Aravalli System and the two Proto-Aravalli Groups, namely the Bendendanesi Complex and the Bundelkhand Gneiss, are older than the Aravallis, which impose a clear erosional unconformity on them. The junction of the two Proto-Aravalli Groups is hidden at great depths and the relationship between the two is not clear. Nevertheless it can certainly be said that the Bendeganisi Complex and Bundelkhand Gneiss are the oldest rocks in India on which the Aravallis and subsequent rock formations and structures are formed. Rajasthan Geological sequence is a very complex rock formation in a solid geological structure.

The Aravalli Group extends up to a depth of 3000 m and mainly consists of quartzite, conglomerates, shales, phyllites, mixed gneiss.

There is a large thickness of argillaceous gneiss in the Aravalli Group. Metamorphism has taken place in these rock formations and it is clearly marked from east to west. In the east you find gneiss and towards the west you pass through slates, phyllites and fine mica schists with garnet and magnetite. In some areas there has been alteration with acidic granite resulting in mixed gneiss. Generally it is observed that igneous intrusions other than white quartz veins are not particularly common in the **Aravallis.**

The northern exposures of the Aravallis are found in South Alwar. The bedrocks occur as anomalies which are irregular and extend southwestwards to the plains of Gujarat. They cover a large part of Mewar and Ajmer-Merwara. Where they are interrupted by irregular anomalies of the full-Aravalli gneiss. The other rocks of the sequence are mainly arkose grit and quartzites which represent the basal beds. The Bundelkhand gneiss or gneiss mixtures with an eroded anomaly configuration are overlying the Bundelkhand gneiss or gneiss mixture. Intercalations of granitic material are also seen in the crystalline and mixed gneiss. Gneiss is extensively developed in this group and its various types characterise the group.

The Raylo range is found in the lower middle part of Aravalli and is covered by Delhi Group. The confluence of both the examples is marked by erosional anomalies. Raylo has been separated from Delhi Group and included in a separate range. Generally white and crystalline limestone of average thickness of about 612 meters forms the main rock of this range. Marble deposits of Makrana (Nagaur) and Andhi (Jaipur) Tahla[illegible] area in Rajasthan fall in the Raylo range.

A very variegated type of limestone is found in almost complete sequence [illegible] as in the south-west. The rocks are expressed for about 80 kilometers in a width of about 1.6

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kilometers. The main varieties are: - crude white calcite, marble, diopside and white mica interlayered with fine blue-grey sandy limestone.

The older rocks of Rajasthan have undergone more intense folding and igneous differentiation and these rocks differ from the rocks of the same age in other parts of India in these characteristics. In Rajasthan, they are known as Delhi Group.

There is no heterogeneity local between Delhi and Aravalli Group. It is found in the north-east from Alwar and in the south-west. Delhi is situated on sediments, Aravalli Schist or Pro-Aravalli gneiss and granite.

The distribution of the above rock groups between Ajabgarh and Alwar range is according to the succession in Jaipur and Alwar. The Alwar range is not uniform in its entire structure and is well developed in north-south whereas it almost disappears in the middle. In the southern part of the contour where the Delhi range is on the Aravallis, it is fine grained quartzite rocks with intercalations of biotite schist.

In the lower part of the Ajabgarh Range a large thickness of biotite schists intercalated with pegmatites and aplites occurs in large walls and veins. The least metamorphic state observed in these rocks is that of phyllites. A mixed gneiss fractionation from phyllites and biotite schists is also observed. These large-scale facies of pegmatites and aplites are formed due to the alternation of dark silicates like calc-schist banded and flagellated helices, banding, and yellow silicates like biotite and entonite with yellow silicates like diopside, dimolite and feldspar.

The Delhi is interpenetrated by slabs and walls. In the south, siliceous biotite limestone forms a long plateau which starts near Beawar and extends to Mewar in the south-west. The Delhi rocks are comparatively thinner and less metamorphosed in Mewar.

2.3.2.2 Soil

The plains have loamy and hard clay soil, some area mainly have hard clay soil with boulders in the Terai region of the Aravali range, loamy soil and sand dunes in the desert region and gravelly soil in the river ghats and at many places there is hard soil with pebbles and gravels. In this area, according to the nature of this soil, Rebains (caves) are formed and in the desert area of Panchayat Samiti Ghoud, there is sand soil, loamy soil and hard clay soil and in some areas where there are hills of Aravali range, hard, clay soil with boulders is also found.

Soil fertility and crops:

The amount of nutrients (Nitrogen/Phosphorus/Potash) in the soil of this area is not the same. Generally, nitrogen is available in very less quantity in the soil. Whereas the availability of potash is medium and phosphorus is found in medium to high quantity. Phosphorus is found in high quantity in the soil of many of this area.

The fertility of the land also keeps changing with time. To maintain the fertility in this soil, artificial nitrogen fertilizer has to be given in the form of chemical fertilizers. Fertilizers giving potash will also be required in the soil. It is necessary to maintain the fertility of the land at a proper level by artificially fulfilling the deficiency and excess of nutrients so that the

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production can be continuously increased in proper amount from the land. Millet is the main agricultural input in the Fatehpur, but wheat is the main crop grown mainly in Fatehpur.

2.3.2.3 Mineral sources:

Many types of important mineral wealth are found in Sikar district, the sale of which gives the state a lot of revenue every year. According to the information received from the Mineral Department, the following types of minerals are found:-

(a) Major Minerals:

(1) Feldspar
(2) Quartz
(3) Limestone
(4) Dolomite
(5) Calcite
(6) Silica sand
(7) Iron
(8) Uranium

(b) Minor Minerals:

(1) Masonry stone
(2) Limestone (burning)
(3) Marble
(4) Brick clay
(5) Kankar clay
(6) Granite
(7) Quartzite
(8) Fuller's earth

Mineral Resources: Huge deposit of pyrite - pyrrhotites is recorded from Saladipura (27°40':75°31') which is mined extensively for sulphur extraction. The estimated reserves of 111.62 million tonne (Mt) of pyrite -pyrrhotite with an average of 21.63% Sulphur. Extensiveancient mining activities for copper in the form of old Working and slag, dump are recorded froma number of places within the South Khetri Belt namely Shakambhari (27°43':75°55') South ofMavanda (27°48':75°50'). NW of Ghata (27°35':75°50') etc. Apatite is found In Kerpura (27°39' -75°34') Salwari (27°39':75°36') area in post Delhi - granite as veins. P_2O_5 contains is nearly41%. Fluorite occurs as siringers, veins and pockets in quartz veins, amphibole rich rock and granite Limestone deposit near Patan (27°50': 75°58') is estimated to contain 6.98 Mt oflimestone with 46.54% CaO. Other occurrences are reported from Raipur Jhingar (27°38':
76°01') and Saladipura. The Khandela area has revealed the presence of moderately radioactive zones in quartz - biotite schist aplitic rocks and quartz- [illegible]e veins. TheUranium zone contains 0.04 to 0.11% O_3U_8. The mineralised zone also contain molybdenum and copper mineralization. Barytes occurrences are reported from Khandela of Gaonri (27°42':75°50'). Iron ore occurrene from Kalakhera (27°42':75°59') and NW of

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Jhalra (27°52':75°52') Clay deposit is located NE- of Churla (27°34':75°56') Calcite occurrences arelocated at Mavanda, Raipur. West of Kalakhera north of Saladipura and many other places' Calcite occurs as veins, pockets and lenses in the marble and gneisses of Delhi Supergroup (10) Cheja stone - Chejastone is the last mineral but is not less important than any other mineral. It is mined on almost all the hills of the district. In the past years, excessive exploitation/mining has taken place due to its extensive use in the construction work of the city, which was further accelerated due to the growing expansion of the city, but after the Supreme Court passed an order dated 12.12.1996 to immediately stop non-forestry activities in forest areas, keeping in view the importance of environment, mining operations have been stopped at most of the sites (in forest areas). The state is getting good revenue from Cheja stone.

2.3.3 TERRAIN:

The district can be divided into twomain topographic units the western half characterized by dunal country and 22 waste land, andthe eastern half characterized by NE-SW trending hill ranges. These hill ranges act as naturalbarriers and restrict large scale sand migration from the west.
Geologically, the district is not of much significance as the major part of the district iscovered by Aeolian sand and sand dunes. Geomophologically the district is classified into seven geomorphic units namelylongitudinal dune, transverse dune, obstacle dunes, sand sheet, piedmont, ridge and valley andpediment. The shadow zones behind ridge and valley acting as sand barriers, are the only areas used for cultivation of seasonal crops. The area is characterized by two hydrogeologicaldomains unconsolidated porous quaternary formations and consolidated fissured formationswith ground water potential ranging from less than 1 to 100 LPS. The district forms thecatchment areas for various river valleys. These are Dohan in the northeast, Sabi, Sota andBanganga in the east and Mendha in the south. Although, these river systems originate fromSikar district, they remain dry for the most part of the year due to scanty rainfall and sandmigration. As the district is prone to sand accumulation and migration, the effects ofenvironmental hazards related to desertification is visible at most of the places theseincludesdegradation of river valley, salinity of ground water and over-stepping of recent dunesover the cultivated lands.

2.3.4 Climate:

Sikar possesses the characteristics of hot and dry climatic conditions. These conditions are generally found in north-western regions of the country which are majorly arid or semi-arid. The climate of this district is characterized by a hot summer, scanty rainfalls, chilly winters anddry atmosphere. Months May and June are the hottest and driest. These months experience the most sanddune movements in desertic region of the district. June and July are the windiest and receives highest rainfall. The mean annual rainfall of the [illegible] is 463.0 mm. Almost 95% of the total annual rainfall is received during the southwest monsoon which enters the district in the last week of June and lastsup to mid-September. The climate

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of the district is generally dry except during the monsoon period. The humidity is highest in month of August with mean daily relative humidity of 8.

Month-wise Average Climatic Condition for Sikar District

Climatic Attributes / Month	January	February	March	April	May	June	July	August	September	October	November	December
Maximum Temperature (°C)	23	27	33	38	42	45	37	34	35	35	30	26
Minimum Temperature (°C)	6	12	17	22	27	26	25	25	24	20	14	5
Average Temperature (°C)	15	20	25	30	34	33	31	29	29	28	22	16
Precipitation/ Rainfall (mm)	4.5	11.7	15.2	16	15.8	76.3	138.3	170.6	81.8	13	8.8	7.9
Humidity (%)	46	50	35	36	27	46	73	81	67	43	38	42
Wind Velocity (km/h)	6	8	8.5	10	12	13	14	11	8	7	5	5

Months of April to July have a daily temperature of around 30°C. The maximum temperature during the months of May and June can reach close to 50°C. During the monsoon there are frequent heavy rains and thunderstorms, but flooding is not common. The winter months of November to February are mild and pleasant, with average temperature ranging from 15-18°C and with little or no humidity. However, there are occasional cold fronts that lead to temperatures near freezing. 48.53 cm rainfall is recorded from June to September during the year 2016. The normal annual rainfall of the district is 44.03 cm. Mean annual rainfall (1971-2011) of the district is 463.0 mm whereas normal rainfall (1901-70) is lower than average rainfall and placed at 459.8. Almost 95% of the total annual rainfall is received during the southwest monsoon, which enters the district in the last week of June and withdraws in the middle of September. The mean annual rainfall is highest (536.6 mm) at Neem Ka Thana, which is located in the south eastern part of the district. It is lowest at Sikar(407.8 mm), which lies near the north western boundary of the district. Climate is generally dry except during the monsoon period.

The climate of this region in eastern Rajasthan is very hot with hot summers, very little rainfall and short winters. According to meteorologists, the climate falls under the semi-arid climate zone. Mainly the seasons are divided as follows:-

1. Autumn

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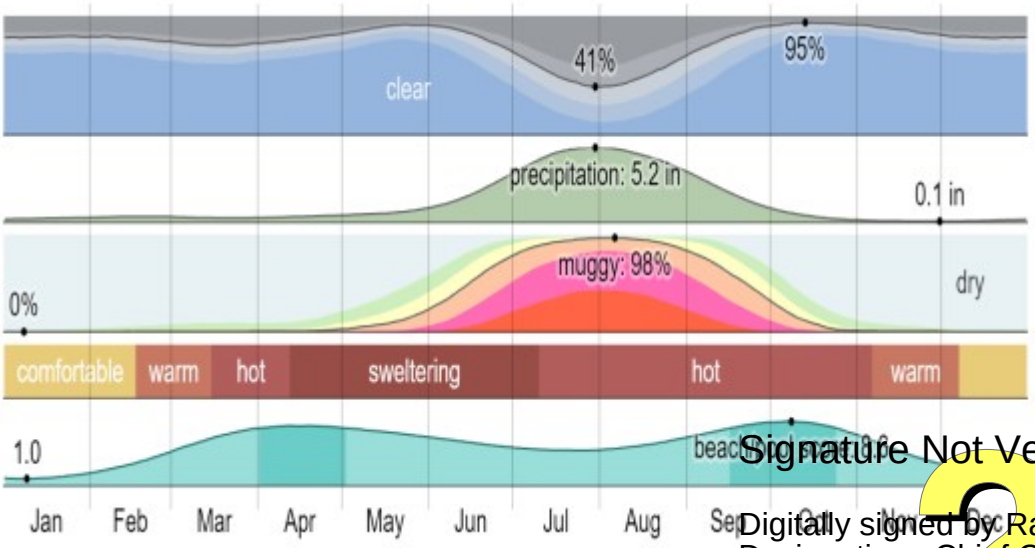
2. Summer
3. South-west monsoon
4. Retreating monsoon season

But according to ancient Indian knowledge (Hindi Samvatsara) the year is divided into seasonal cycles of 2 months each as follows-

Sr. No.	Season	Months as per Indian Calendar (Samvatsara)	Months as per English Calendar
1	Spring	Chaitra-Baisaakh	March-April
2	Summer	Jyestha-Ashadha	May-June
3	Rain	Shravan-Bhadrapada	July-August
4	Autumn	Ashwin-Kartik	September-October
5	Hemant	Margashirsha-Paush	November-December
6	Winter	Magh-Phalgun	January-February

In this area, the wet season is hot, muggy, and partly cloudy and the dry season is warm and mostly clear. Over the course of the year, the temperature typically varies from 47°F or above 109°F. The best time of year to visit here for hot-weather activities is from early April to early May and from mid-September to late October.



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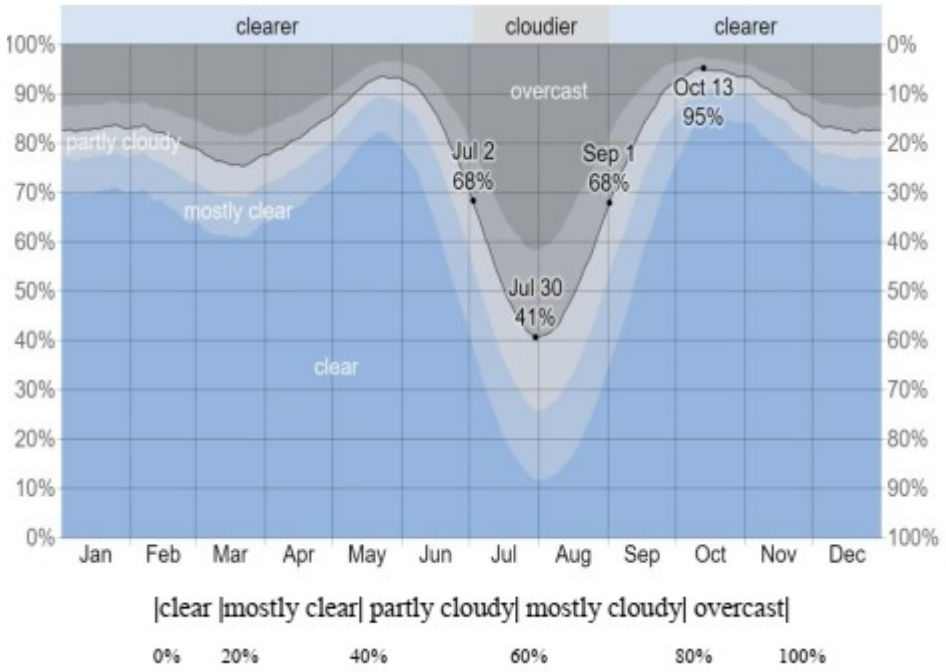
The hot season lasts for 2.7 months, from April 1 to July 5, with an average daily high temperature above 96°F. The hottest month of the year in Sikar Range is June, with an average high of 101°F and low of 82°F.
The cool season lasts for 2.4 months, from December 6 to February 17, with an average daily hightemperature below 75°F. The coldest month of the year in Sikar Range is January, with an averagelow of 48°F and high of 69°F.

2.3.4.1 Clouds:

In Sikar Range, the average percentage of the sky covered by clouds experiences extreme seasonal variation over the course of the year. The clearer part of the year in Sikar Range begins around September 1 and lasts for 10 months, ending around July 2. The clearest month of the year in Sikar is October, during which on average the sky is clear, mostlyclear, or partly cloudy 94% of the time. The cloudiest part of the year begins around July 2 and lasts for 2 months, ending around September 1. The cloudiest month of the year in Sikar Range is August, during which on average the sky is overcastor mostly cloudy 49% of the time.



Fraction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cloudier	17%	18%	23%	19%	9%	15%	48%	49%	18%	11%	17%	
Clearer	83%	82%	77%	81%	91%	85%	52%	51%	82%	94%	89%	85%

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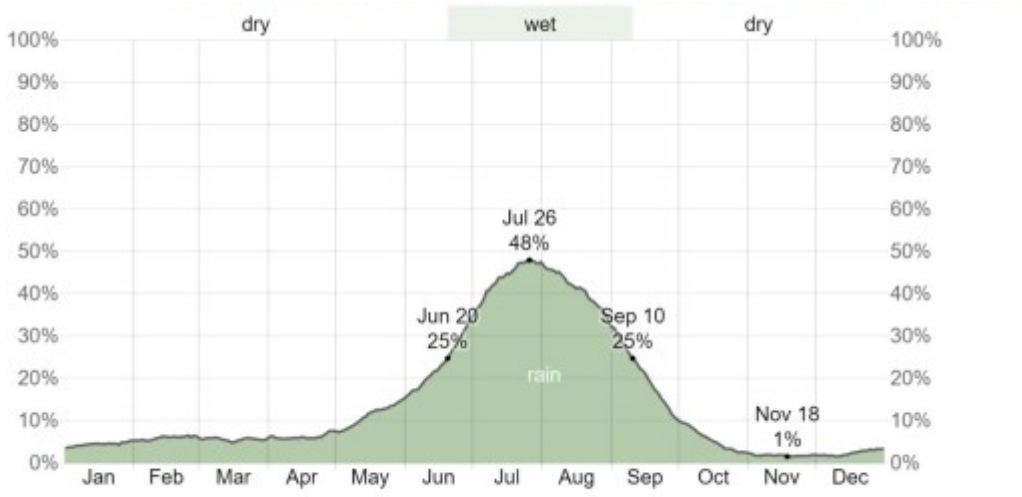
2.3.4.2 Precipitation:

A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet daysin Sikarvaries significantly throughout the year.
The wetter season lasts 2.7 months from June 20 to September 10, with greater than 25% chance of a givenday being a wet day. The month with the most wet days in SikarRange is July, with an average of13.5 days with at least 0.04 inches of precipitation.
The drier season lasts 9.3 months, from September 10 to June 20. The month with the fewest wet days in SikarRange is November, with an average of 0.5 days with at least 0.04 inches precipitation. Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. The month with the most days of rain alone in SikarRange is July, with an average of 13.5 days. Based on this categorization, the most common form of precipitation throughout the year is rain alone, with apeak probability of 48% on July 26.



The percentage of days in which various types of precipitation are observed, excluding, excluding trace quantities: rain alone, snow alone, and mixed.

Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Of Rain	1.4d	1.7d	1.7d	1.8d	3.5d	7.0d	13.5 d	12.7 d	6.3d	1.7d	0.5d	0.7d

2.3.4.3 Rainfall:

It shows variation within the months and not just the monthly totals, we show the rainfall accumulated over as liding 31-days period centered on each day of the year. SikarRange experiences extreme seasonal variation in monthly rainfall. The rainy period of the year lasts for 5.5 months, from April 29 to October 13, with a sliding 31-day rainfall of at least 0.5 inches. The months with the most rain is July, with an average rainfall of [illegible] inches. The rainless period of the year lasts for 6.5 months, from October 13 to April 29. The month with the least rain in this region is November, with an average rainfall of 0.1 inches.

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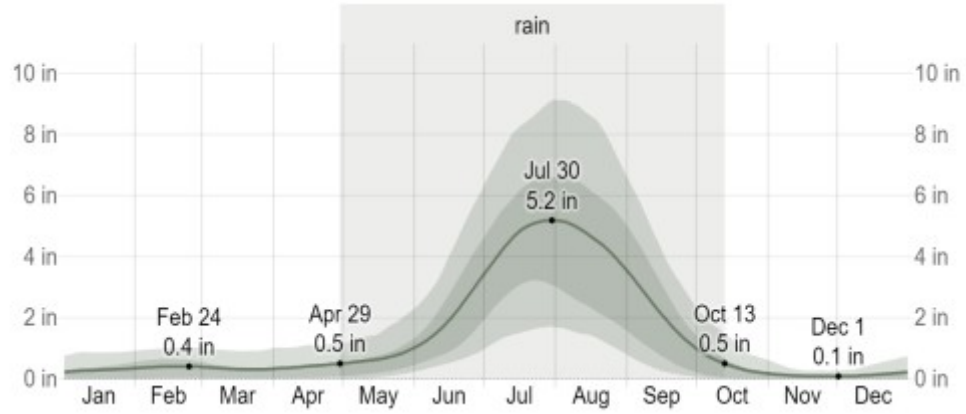
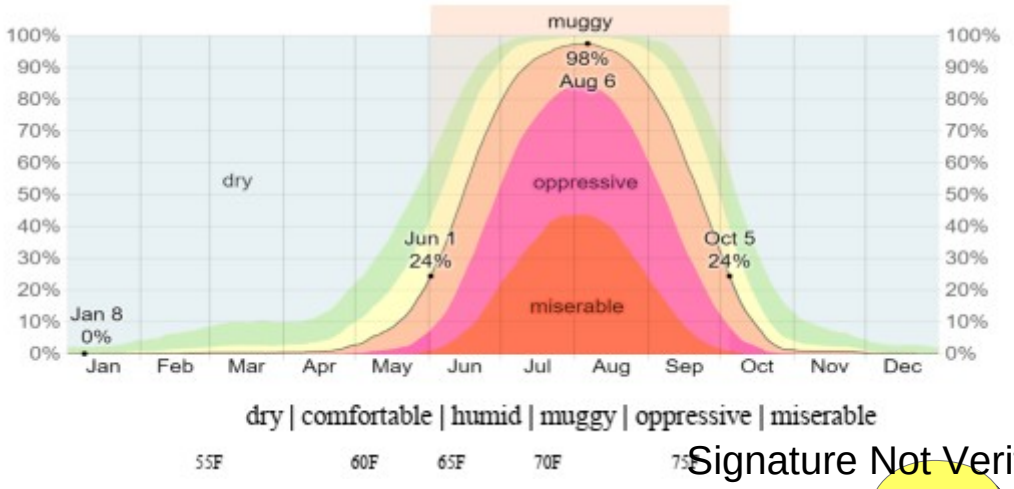


Rain fall	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.3”	0.4”	0.3”	0.4”	0.6”	1.9”	4.8”	4.7”	2.2”	0.4”	0.1”	0.1”

2.3.4.4 Humidity:

The base of humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew point feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. Sikar Range experiences extreme seasonal variation in the perceived humidity. The muggier period of the year lasts for 4.1 months, from June 1 to October 5, during which time the comfort level is muggy, oppressive, or miserable at least 24% of the time. The month with the muggiest days in Sikar Range is August, with 29.1 days that are muggy or worse. The month with the fewest muggy days in Sikar is January, with 0.0 days that are muggy or worse.



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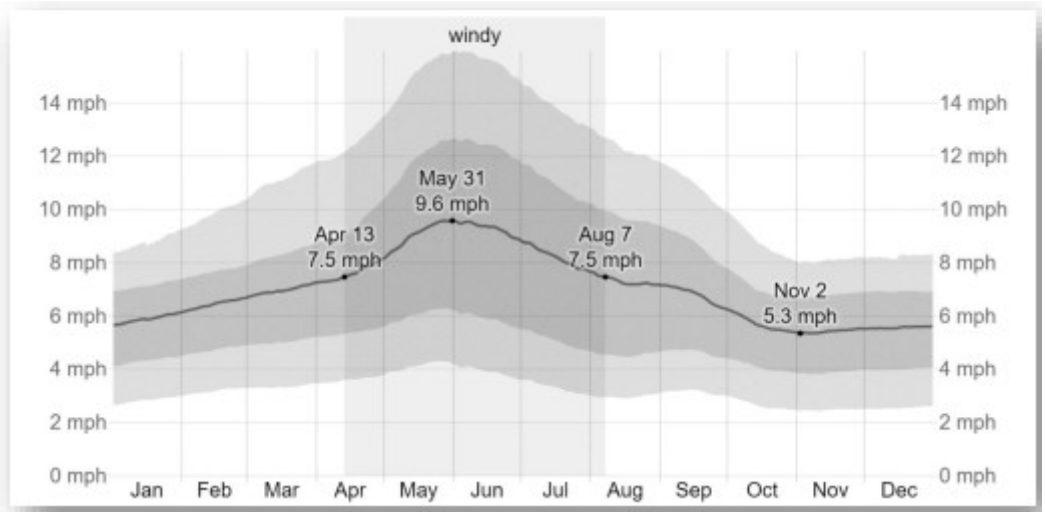
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Muggy Days	0.0d	0.0d	0.1d	0.3d	3.1d	15.4 d	28.4 d	29.1 d	18.3 d	3.4d	0.2d	0.0d

2.3.4.5 Wind:

This section discusses the wide area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and otherfactors, and instantaneous wind speed and direction vary more widely than hourly average. The average hourly speed in Sikar experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 3.8 months, from April 13 to August 7, with average wind speed of more than 7.5 miles per hour. The windiest month of the year in Sikar Range is June, with an average hourly wind speed of 9.3 miles per hour. The calmer time of year lasts for 8.2 months, from August 7 to April 13. The calmest month of the year in Sikar Range is November, with an average hourly wind speed of 5.4 miles per hour.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed (mph)	5.9	6.4	7.0	7.6	9.1	9.3	8.2	7.3	6.8	5.7	5.4	5.6

The predominant average hourly wind direction here varies throughout the year. Wind is most often from the west for 6.4 months, from March 28 to October 8, with a peak percentage of 72% on May 28. Wind is most often from the north for 5.6 months, from October 8 to March 28, with apeak percentage of 49% on January 1.

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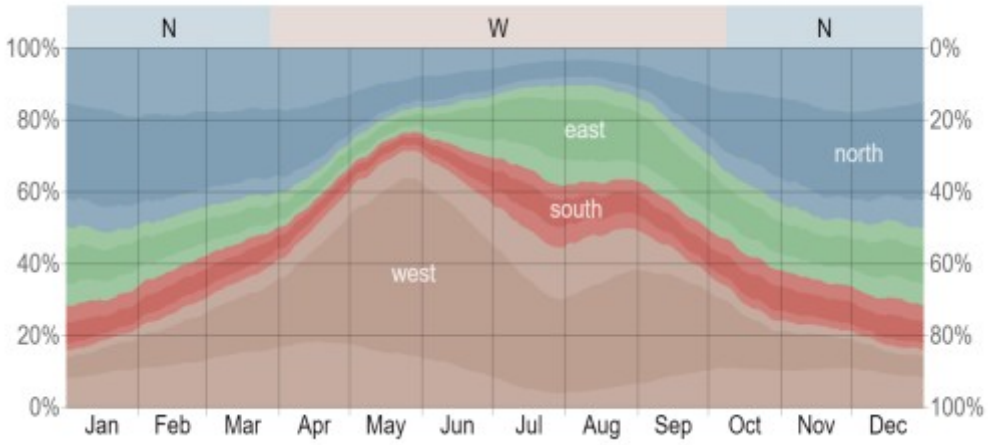

2.3.4.5 Drought, and its periodicity; Natural Hazards and Disasters Frequency, Intensity, Loss of Lives, Property and Economic Loss and Other Consequences:

There are not any loss of lives and property due to natural hazards in this area. Only low average of rainfall is a basic natural problem to be faced. Flora & fauna is affected due to pala in winters.

2.3.4.6 Effectiveness/Problems of Rescue, Relief and Rehabilitation:

Help will be taken from local authorities of villages, police & administration during natural disasters & hazards.

2.3.4.7 Government and non-government agencies with which convergence of conservation programmes is possible; likewise disparities that are a problem

Many of the government departments like Agriculture, local bodies, police, women empowerment, Administration, PHED, Social Justice, Horticulture and Animal Husbandry have a greater role to play in reducing biotic pressure on natural resources. Public Works Department and Energy Department are the ones having mandates that are non eco-friendly and rather damaging the wildlife.

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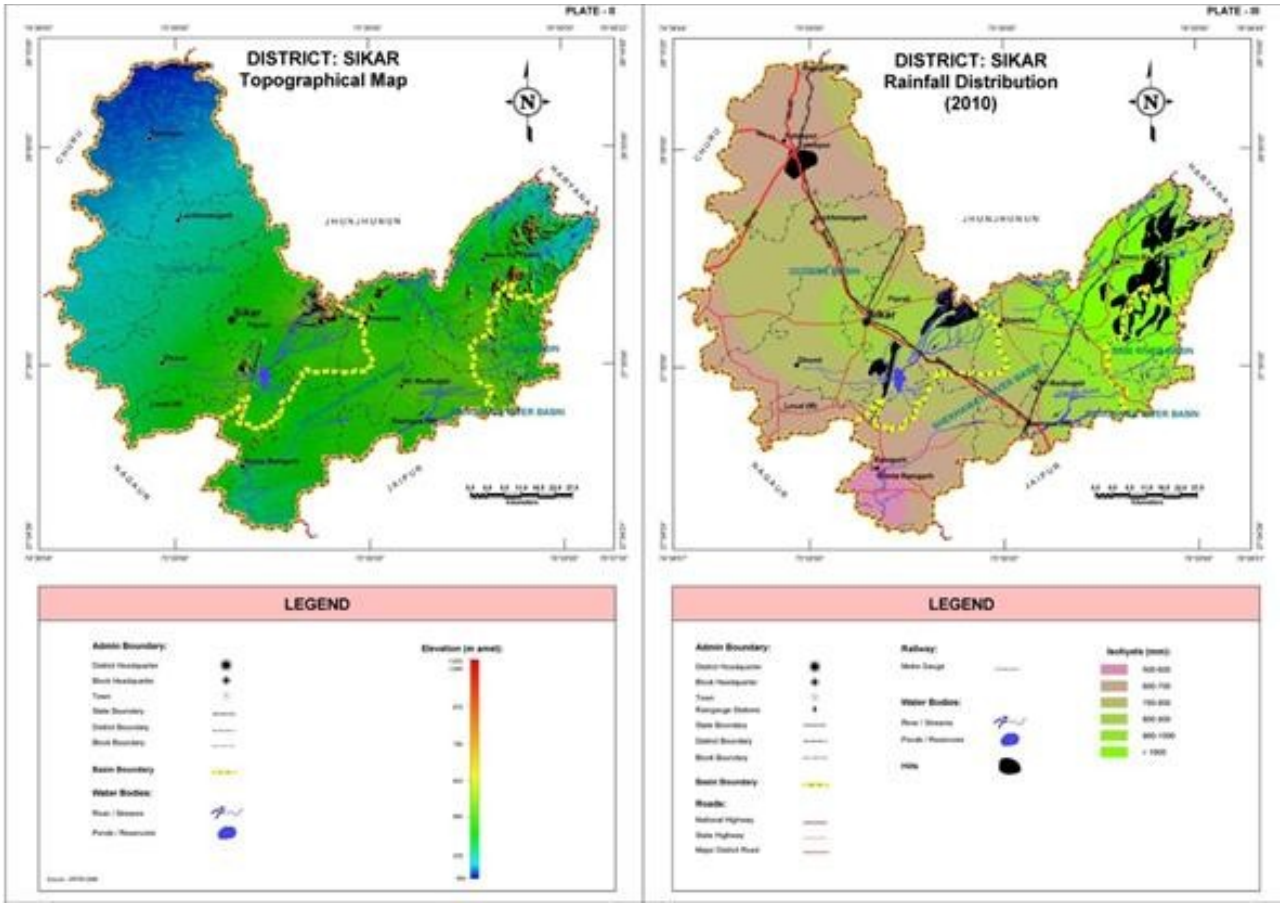

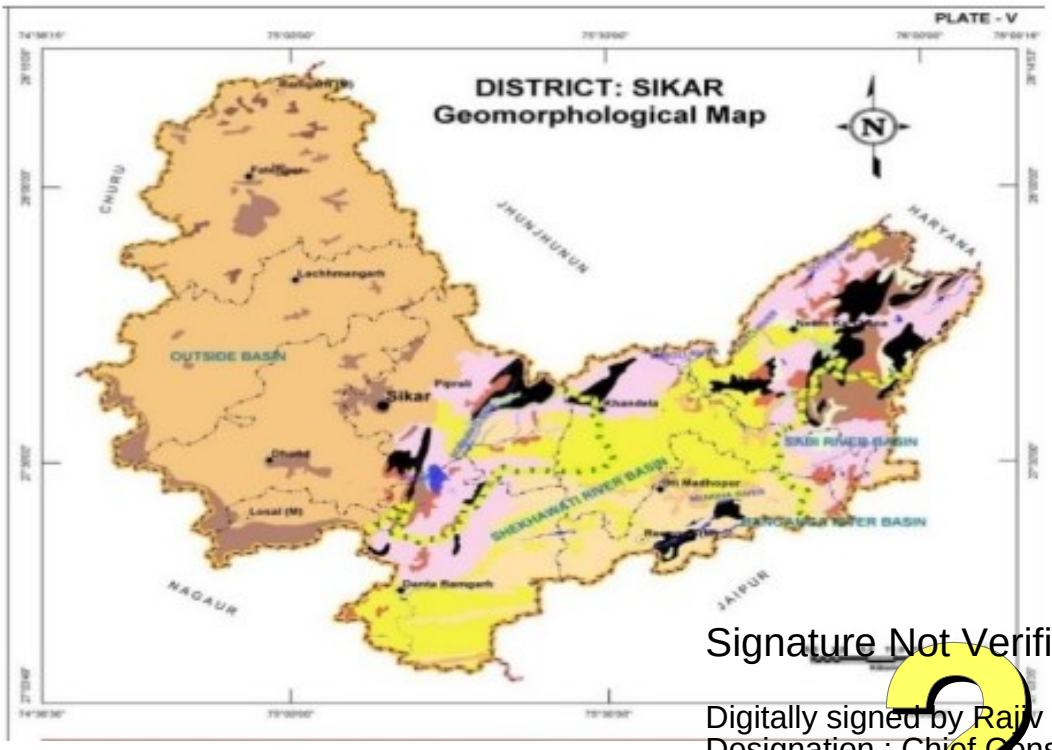

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2.4 Water Sources:

Main source of water for human as well as wildlife is rain water and the rain water is sufficient only for 3-4 months up to Nov-Dec. Water is a limiting factor in this region. Reserve is also having a network of artificial water supply system. An underground storage tank with a good amount of capacity has been constructed and it is filled with water supplied by PHED system. Few water holes of the reserve are connected through pipeline networks. Water is pumped from this storage tank to different water holes during scarcity days.
Underground water of the area is at very low level. In the Sikar Range there is main source of water is only rain water source and in the reserve area of Sikar there are no artificial water resources like electrified wells except one passing through this reserve area. As we know water is an essential and life saving thing for human as well as animals. The main source of water is rain, and well is also a source with is to be developed by the humans.
There are no perennial rivers in area. There is some olden water structure present in the area and during the rainy season, the water accumulates in these several low ying areas of water bodies. During summers water for wild animals will be supplied by water tankers for drinking purposes respectively. The ground water is the only source for water in the area except rainfall. In future, old pucca taka will be renovated to fulfill the requirement of co drinking water for wild animal.

Hydrogeological Framework

The availability, occurrence and movement of groundwater is mainly controlled by the topographic features, physical characteristics and structural features present in the geological formations. Ground water occurs under unconfined to semi-confined conditions. The principal aquifer in the area is Quaternary sediments covering major part of the district (resting in western and central parts of the district) whereas quartzite, schist, phyllite, limestone and dolomitic limestone of Delhi Super Group also constitute important aquifers (resting in the eastern and north central parts of the district mainly in Fatehpur, Khandela, Danta Ramgarh and part of Piprali blocks)
Ground water occurs in the pore spaces and interstitial openings of Quaternary alluvium while in hard rock formations, occurrence and movement of groundwater is controlled by secondary porosity i.e., through the bedding planes, fissures, joints, fractures, solution cavities and other structurally weaker planes.

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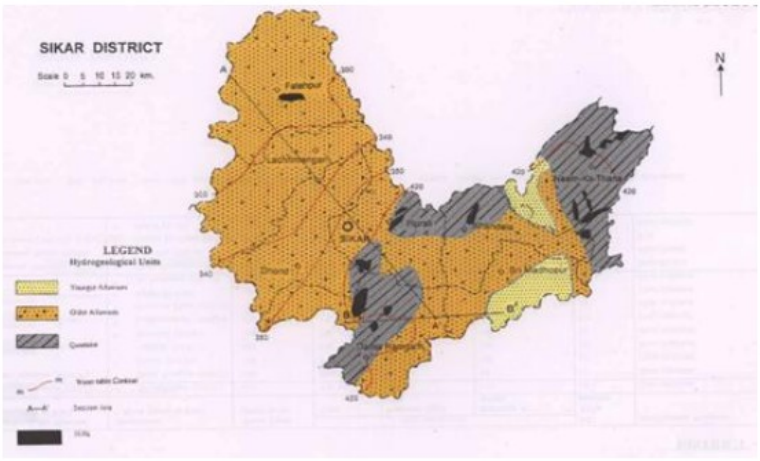

2.5 Forest Types and Cover Attributes

2.5.1 Structure and Condition of Forests:

Except the Aravalli mountain ranges falls in the category of desert or semi-desert areas where there is very little natural forest area.

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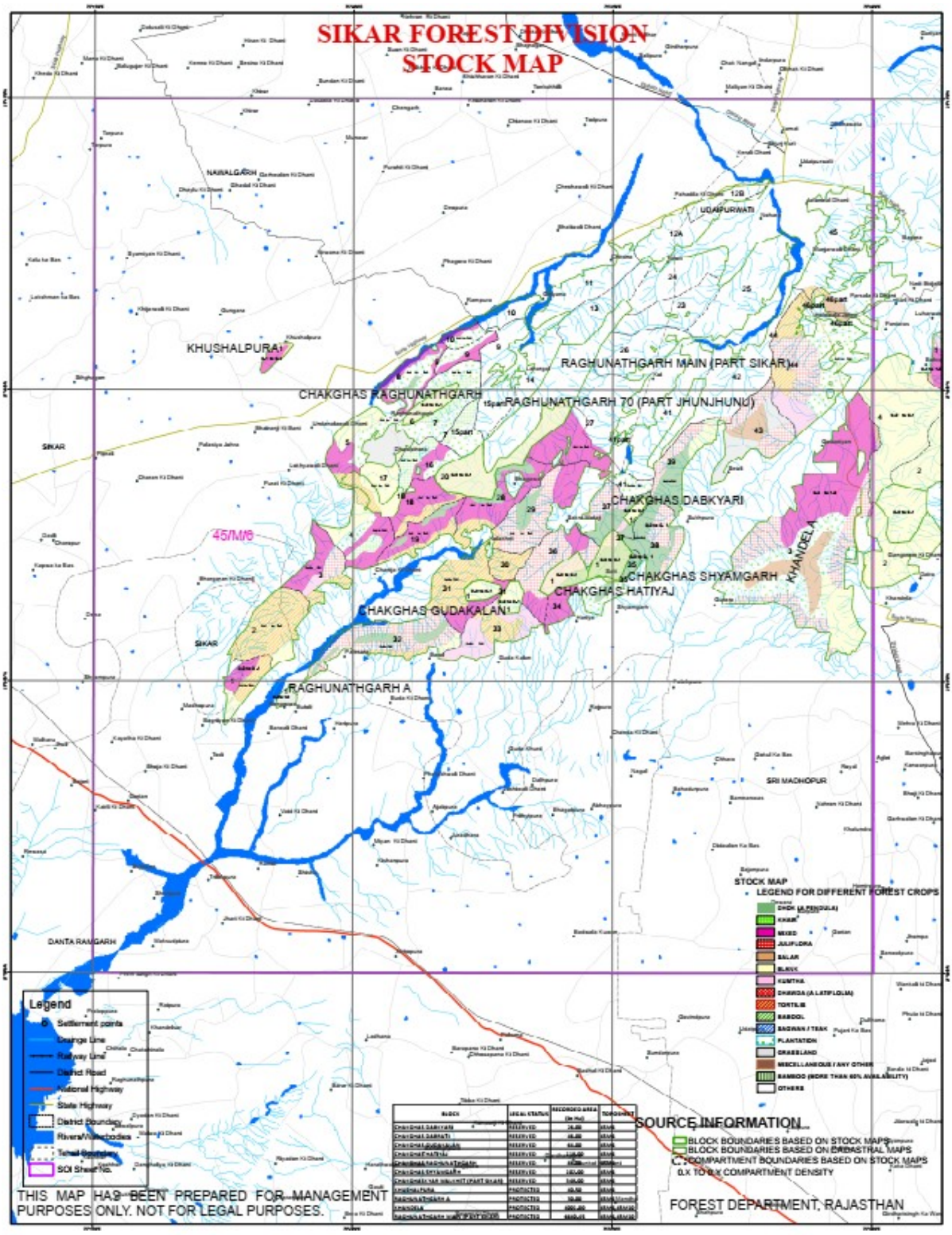

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Forest block is mainly grassland and divided into four forest compartments. Their description is given below.

Compartment Description

1. Forest Division - Sikar

2. Range – Sikar, Shrimadhopur

3. Forest Block – Raghunathgarh Main

4. No. of Compartments in Sikar 38

5. Legal Status – Protected Forest

6. Description of the area – 13100 Ha.

7. Geographical location – situated at a distance of 6 km from Khandela.

8. Description of the area of this portfolio in the outline of earlier work: The above area was included in the grass and grazing work circle of the first working plan of Jaipur Forest Division from the year 1966 to 1976-78. Plan was prepared by Shri S.K. Verma Jaipur Forest Division. That time it was covered in Grass Grazing Working Circle 1966-67.

9. Boundary:

Northern Boundary –Northern Boundary of Raghunathgarh Main Protected Forest
Southern Boundary -Southern Boundary of Raghunathgarh Main Protected Forest
Eastern Boundary - Eastern Boundary of Raghunathgarh Main Protected Forest
Western Boundary -Western Boundary of Raghunathgarh Main Protected Forest

10. Level from sea shore - 330 meters

11. Main Aspect - No gradient

12. Slope - Uniform

13. Landform - Sandy plain to rough ground surface

14. Rocks and Soil- clay soil , stable clay soil, clay soil & clay soil, clay soil & clay soil

15. Site Quality - Medium

16. Growing Stock Status - Khejri, Israeli Babul Kumtha Patra, Murraya, Khip, Sania, Bui, Dhamas, Skaber, Bharut, Bhankadi, Lapla

17. Age and condition of vegetation - of all ages

18. Vegetation density – Between 0.1 to 0.4

19. Animals - Jackal, Fox, Rabbit, Sambhar, Deer and many local migratory birds etc. are abundant.

20. Special details: This area was leased to the Forest Department from the very beginning and since then its protection management is being done. The description ha[illegible]ne by the Forest Department which is well situated in area and this area is situated in[illegible]. This area is being forest rich is proposed to be declared as a protected area which will be prepared

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by the department under the management plan. Originally no agenda has been approved for this department in this work plan.

21. History of the Department: This department plan was prepared by Shri S.K. Verma of Jaipur Forest Division during 1966-67, IFS Work Planning Officer, Jaipur, had made arrangements for grass and grazing in the work planning. But no one participated in the workshop work, from the year 1980 to 14-15, no forest growth was done in the forest area of the division and there was not much pressure on grazing and healing. During the period of Verma work planning, control firm and deviation database were not maintained in Jaipur forest division, hence correct details of the constitution history are not possible. In the year 1980, this division of Sikar forest division was divided into two divisions. Sikar Forest Division was transferred to the area and even after that, the management of this department was not done from the establishment of the Forest Division. Rather, during this period, some record work and security work of the area is also being done.

2.5.1.1 Classification of forests:

According to the 1968 edition of the book "Revised Classification of Indian Forest Types" written by Champion and Seth, the forests of this district come under the category of "Dry Tropical Forests". According to Champion and Seth, the following group and sub-group types and sub-types of forests can be classified in this district.

Group 5- Tropical Dry Deciduous Forest
Subgroup 5B - Northern Tropical Dry Deciduous Forest
Type 5B/C2 - Northern Dry Mixed Deciduous Forest

The sequence of forests at the surface climax is as follows:
The degraded stages of tropical dry deciduous forests are as follows:-

5B/E_1- *Anogeissus pendula* Forest

5B/E_2 - Boswellia Forest

5B/E_3-Babul Forest

5B/E_5- Butea Forest

The degraded stages of tropical dry deciduous forests are as follows:

5DS_1	-	**Dry Deciduous scrub**
5E_1/DS_1	-	***Anogeissus pendula* Scrub**
5DS_3	-	**Euphorbia scrub**
5DS_4	-	**Dry grass Land**

Subgroup 6B & Northern Tropical Thorn Forests

Type 6B/C_1	-	Desert Thorn Forest

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Type 6B/C_2 - Ravine Thorn Forest

The degraded stages of Tropical thorn forests are as follows:-

6DS1 - **Zizyphus Scrub**

6DS2 - **Tropical Euphorbia Scrub**

6/E2 - **Kumtha Forest**

6/E4 - **Pilu Forest**

6/E1/DS1/IS1 - **Desert Dune scrub**

2.5.1.2 Northern Dry Mixed Deciduous Forest

This type of forest is generally found in Shrimadhopur, Khandela, Sikar and Piprali areas. But it has also been observed that Dhonk, Salar, Kumtha and Dhak species also belong to this category. These groups grow well in the valley where soil and moisture are found. On plateaus and slopes with good drainage. Salar has a tendency to replace this type of forests, while on other dry slopes, Dhaunk trees replace them.

In this forest, Kumtha, Salar, Kadaaya, Senjana, Siras, Gular, Dhak, Papadi, Khair etc. are found in the upper canopy trees and Khirni, Amaltas, Raunj, Ber etc. are found in the form of small trees. Danceran, Adusa, Jhadber etc. are found in the lower canopy. Satyanashi, Neel, Amaranthus species, Hibiscus lobatus, Salvia, Egyptia, Polygonum etc. are found on the land surface. The main grasses found are Lapla, Dhaman, Karad, Surwal etc. The specialty of these forests is that they remain without leaves from March to June, when fruits and flowers appear.

Ecological Situation: The mixed forests described above are climatic dermatology forests, but the nature of most of the species is to replace surface dermatology in pure group because in the Aravalli mountain ranges, the result of surface dermatology is found in groups of different species in different surface conditions.

2.5.1.3 Dhonk Forest:

Most of the trees are found in this type of forest are of Dhonk species and 80 percent of the forests are of this type. Associate species of Dhonk are Salar, Khirni, Dhak, Churel, Khair, Ronj, Kumtha, Siras, Peepal etc. are found in the forest divisions of Harsh Parvat and Fatehpur. Kair, Jhadber, Adusa, Vajradanti, Danceren etc. are found in the lower canopy. Grasses like Lapla, Doob, Karad etc. are found in this area. Creepers like Kali Dudhi, Badh, Shatabdi Koch etc. are found in these forests.

These forests are at a considerable distance from the inhabited area. Some forests which were close to the inhabited area have been destroyed to a great extent. The height of the thicket varies from 3.0 to 15.0 m and its diameter varies from 30 to 80 cm. The main constituent

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species such as salar and gurjan vary from 10.0 to 15 m and 5.0 to 12.0 m in diameter and 15.0 to 30.0 m and 8 to 30 m respectively.
Crop density varies from 0.3 to 0.7. Regeneration status varies from poor to good. Most of the regeneration is of native origin. Regeneration is limited to a few interior areas where the effect of biological factors is minimal.

Ecological Status:

In dry mixed deciduous forest, several tree species are capable of forming a species-pure forest area. Such forest types are highly tolerant of soil, air and vegetation.
It is found in dry forests under harsh conditions of biotic factors. Dhonk is an excellent example of this. Due to illegal felling and grazing, dhonk trees have disappeared from some areas. Bamboo is also found along with dhaunk in moist areas. Dhaunk and Kumtha are found together on dry slopes. In places with some thorny species, where there is settled sand, Kumtha and some thorny plants are also found.
In the last four-five decades, 80 percent of the trees in Dhaunk forests have disappeared due to uncontrolled grazing, illegal felling and clearing. The growth of some trees has stopped, they have become bushy and the density of Dhaunk has also reduced. In these areas, apart from the main species, encroachment of Thor, Dancerain, Kalisali and some species of grass like Lapla, Sporobolus, Lamp etc. has started. The wood of the Dhaunk trees was illegally felled for fodder and fuel. The small plants and the regeneration from the copses were grazed and crushed by the cattle. In such areas, thorny plants like Ronjh, Jhadiber, Kumtha, Khair etc. grow again. Hence, due to excessive felling, pruning etc., the Dhaunk trees have taken a bushy shape.

2.5.1.4 Salar Forest:

This is a type of open forest in which the upper forest is for the Salar trees – small trees. Their height is 10 m to 20 m and diameter is 30 cm to 50 cm. Trees of this species have become dwarf in Harsh, Neemka Thana and Patan Range areas. Their trunk has become crooked and thick. Jhijha, Siras, Khirni etc. are its associate species. Bamboo is found in moist areas. In such areas, grass species like Lamp, Seen etc. are found. A parasite called Banda (Dedrothe falcata) depends on Salar. It has deciduous leaves from February to June.

2.6 Flora and Fauna
2.6.2 Faunal Diversity:

A detailed list of wild animals found in this area has been submitted at the beginning of the plan. The commonly found mammals, birds, reptiles, amphibians and fishes are as follows:

2.6.2.1 Mammals:
There are not many mammalian wild animals in the forest area or non-forest areas of this area. During the peak summer when there is a shortage of water, shade and food in the forest areas, only then signs of the presence of wild animals are found in the population or fields.

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There is no wildlife sanctuary area in the forest division, however, various types of wild animals and birds can be seen in ponds, johads, anicuts etc. The mammalian animals commonly found in the district are as follows:-

Chinkara
Nilgai
Desert Fox
Wild cat
Squirrel
Hare
Rat
Mongoose
Jhau rat
Common Palm Civet

2.6.2.2 Bird class:

The most commonly spotted bird species of this area were Cattle Egret, Intermediate Egret, Red-wattled Lapwing, Rock Pigeon, Eurasian Collared-Dove, Spotted Dove, Chestnut-headed Bee-eater, Bank Myna and Common Myna. The Indian Peafowl was observed which is listed as schedule –I as per WPA, 1972 and others listed as schedule IV as per WPA, 1972.

Due to the presence of ponds and anicuts, a suitable environment is available for migratory and non-migratory birds. During winter months, some of the following migratory birds can be frequently seen at the numerous ponds and anicuts spread across the region.

Some of the local migratory birds frequently visiting the region during summer season are:-

* Some Quails
* Some Bee-eaters

Some of the main birds locally found in the region are:-

*Green Bee-eaters
*Shikra
* House Sparrow
* Various types of Parrots
*Various types of Munias
* Various Sandgrouse
*Various types of Mynas
* Various types of Owls

Birds of water sources are found around ponds, check dams, anicuts, mining areas etc. Trees of different species like Banyan, Peepal, Mango, Babul etc. are found on the Paal which provide a suitable shelter for birds. Snails, frogs and many types of animals suitable for birds are found in these water sources. Due to the high temperature at water sources in winter, insect eating birds get enough food even in winter. For this reason, migratory and non-migratory birds can be seen at all water sources in the district in winter.

The following bird species are on the verge of extinction:-

Spotted Creeper
Scaly Breasted Munia
Spanish Sparrow

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2.6.2.3 Reptile Class:

The reptile, Common Garden Lizard, Common Indian Monitor, House Gecko and FanThroated Lizard, Rosebelly, Worm-eating Snake and Himalayan Wolf Snake were observed; Indian Cobra and Russell's viper were provided protection as per Schedule-II of Wild life Protection Act, (1972).

Due to availability of sufficient water reserves in the district, reptile class animals are found in large numbers. The list of reptile class animals found here is as follows:-

*Monitor Lizard

*Sand boa Snake

2.6.2.4 Amphibian Class:

Due to availability of sufficient water reserves in the district, suitable environment and surroundings are available for breeding and growth of amphibious creatures. Toads and frogs are generally found in sufficient numbers in the district. Sufficient space and sufficient food material is available for these creatures in and around water sources.

2.6.2.5 Fish categories:

Katla Sambal Rohu Bam Kishu NirjiLanchi Bata Singha Singha

Habitat quality, quantity and key areas & vertebrate is an animals that has a backbone and skeleton it includes humans it includes frogs, birds, reptiles, fishes, mammals. Vertebrates are an interesting collection of animals, birds, reptiles, amphibious and fishes etc. Its meaning is joint of Developmental biology. It comprises all species of animals. Vertebrates are the most organized organisms on earth (list is enclosed).

2.6.2.6 The Limiting facts:

Conservation & protection are essential for vertebrates. This Conservation reserve will conserve vertebrates.

2.6.2.7 Importance of Vertebrate, Their status, Distribution and Habitat:

An animal without a social line of bones (backbone) going alone its body. An animal with no spine is called invertebrates (list is enclosed).Eg. Curbs, butterflies, keetpatangs. These are spread in Conservation Reserve area.

2.7 Corridor Linkages (Natural, Anthropogenic and Functionality)

Corridor linkages are connected areas that can be used as pathways for animals to improve connectivity between different areas of land. This can be an important part of wildlife conservation strategies, as they can help with habitat loss and fragmentation.

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It is no secret that habitat destruction and fragmentation are the leading causes of biodiversity loss worldwide and climate change is only making it worse.
Species blinking out, shrinking populations, and significant range contractions caused by human activities have negative impacts on biodiversity as well as ecosystem functions and services. Extinction events have happened before in our Earth's history, but this time, they are happening much faster.

Benefits of Corridors:

Habitat: Corridors can provide habitat for resting and feeding, and can help species continue their migration.
Connectivity: Corridors can help increase gene flow and population viability, and allow species to recolonize areas.
Human-made linkages: Human-made linkages, such as wildlife overpasses and underpasses, can help mitigate habitat loss.

Some Negative Effects of Corridors:

Edge effects: Corridors can be dominated by edge effects, which can increase the risk of disease and parasitism.
Invasive species: Corridors can facilitate the spread of invasive species.
Dispersal barriers: Linear corridors can create new barriers when they intersect other habitats.
Some alternatives to linear corridors include semi-open corridors, which can connect both open habitats and woodlands.

The Importance of Corridors for Biodiversity:

Yet, the bulk of data demonstrates that more than maintaining ecological connectivity through corridors, it is key to the conservation of our natural world. Connected, protected, and conserved areas are stronger, and corridors are a major component in successfully fighting fragmentation and strengthening biodiversity. These physical links are one of the most important ways to ensure species are able to move between protected areas and maintain genetic strength.
Wildlife has many reasons to travel across landscapes and between large protected havens. Daily movements, seasonal migrations, shifting habitats, escaping natural ecosystem disturbances, or the need to adapt to climate change are all possible.
What they face as barriers to their movement can vary as well. Fencing, highways, towns, and other development often stand in the way of finding mates, food, or new places to thrive. Connectivity conservation is therefore needed at local, regional, and global levels and across landscapes with various degrees of influence from people.
Connectivity management ranges from smaller scales, such as between streams or berry patches, to regional and even continental scales, such as major rivers or mountain ranges. Increasingly, looking at landscapes at the scale at which wildlife uses it has become a focus in the conservation world.

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2.8 Socio- economic and Socio-cultural profile /Coastal and Island Community Description

This area has made significant progress in the quest of socio-economic development over the previousfew years. The accurate and comprehensive picture of the economy has been critical since it serves as thefoundation for the planning of significant and inclusive development. There are significant variations in levels of social andeconomic development between regions, as well as within regions. Regional differences in development in Indiahave remained unchanged, notwithstanding general development efforts over the plan years. Regional gaps inpoverty, income, and unemployment have been expanding among a state's several regions (vertical) and districtswithin those areas (horizontal).

Demographic Profile:

The Population of the World is growing at an unprecedented rate. The current populationof the world has already reached 7 billion and is likely to reach over 9 billion by 2050(UNFPA, 2012). It is reported that even if the fertility rate decreases "continued populationgrowth is inevitable". Future population growth would mean increase in social, economicaland environmental disparities, inequities and impacts. Increasingly, most developing countries have witnessed growth in population and it is further projected that future human population growth will remain concentrated in the poor countries (Grundy, 2002), especially those in the most vulnerable parts of the countries. In fact, since ancient times, India has been the home of a considerably large size of population. Though census taking in the country is a matter of only recent past, based on archaeological and historical evidences, scholars havetried to construct the trends in population growth since ancient times.

Population:

According to the census 2011 Sikar district has a population of 26,77,333 of which male and female were 13,74,990 and 13,02,343 respectively. In 2001 census, Sikar had a population of 2,287,788 of which males were 1,172,753 and remaining 1,115,035 were females. In addition to this, 79.35 percent population live in the rural areas, while 20.65 percent reside in urban areas of the district. The percentage of scheduled caste and scheduled tribes population are 14.85 and 2.73 respectively. Sikar district ranks 6th in terms of population, 17th in terms of area and 10th in terms of population density. Sikar district has six tehsils, in which Danta Ramgarh tehsil has the highest number of villages (242) whereas Sikartehsil has lowest number of villages (127). The district has 1167 villages, out of them 1162 villages are inhabited and 5 villages are uninhabited. In Sikar district 183 new villages and 6 new census towns have created as compared to 2001 Census. In the district, Palsana (Tehsil: Danta Ramgarh) is the most populous (13,186 persons) village; and Chak Majipura (Tehsil: Danta Ramgarh) is the least populous (06 persons) village. The district consists 76.3 percent rural and 23.7 percent urban population whereas the state percent of rural and urban population is 75.1 and 24.9 respectively. The sex ratio of the district (947) is significan[illegible] than the state sex ratio (928).The literacy rate in the district is 71.9 percent which is higher than the state average (66.1 percent) and it ranks 4th among the other districts of the sta[illegible] gender gap of the literacy rate is 26.9 percent in the district. The scheduled caste and scheduled tribe

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population in the district is 15.6 percent and 2.8 percent respectively whereas the state percent of scheduled caste and scheduled tribe population is 17.8 and 13.5 respectively. The economy of the district is mainly dependent on agriculture as 58.5 percent workers in the district are either cultivators or agricultural labourers. However the district percentage of such workers is lower than the state average of 62.1 percent. Work participation rate (WPR) of the district has been recorded 37.6 percent and gender gap in WPR is 21.0 percent. In the district among the workers the percentage of cultivators, agricultural labourers, workers in household industry and other workers (category of workers) are 49.8, 8.7, 2.3 and 39.2 percent respectively.

Urbanization And Economic Growth:

Only 30 percent of India's population lives in urban areas. This is much lower than in China, Indonesia, South Korea, Mexico, and Brazil. Some of this may be due to much lower per capita incomes in India. The Committee's projections suggest that India's urban population as presently defined will be close to 600 million by 2031, more than double that in 2001. Already the number of metropolitan cities with population of 1 million and above has increased from 35 in 2001 to 50 in 2011 and is expected to increase further to 87 by 2031. The expanding size of Indian cities happen in many cases through a process of peripheral expansion, with smaller municipalities and large villages surrounding the core city becoming part of the large metropolitan area, placing increasing strain on the country's urban infrastructure. Future growth is likely to concentrate in and around 60 to 70 large cities having a population of one million or more. Decentralization of municipal governance and greater reliance on institutional financing and capital markets for resource mobilization are likely to increase the disparity between the larger and smaller urban centers. A satisfying outcome will depend on the formulation of effective public policies to accelerate allround development of smaller urban centers and to refashion the role of the state as an effective facilitator to compensate for thedeficiencies of market mechanisms in the delivery of public goods. Three decades of rapid economic growth would normally have propelled migration from rural areas but growth in India has not had this effect thus far. This is because industrialization has been capital intensive and the services boom fuelled by the knowledge economy has also, been skill intensive. A few cities of India have acted as centers of knowledge and innovation. As more cities provide economies of agglomeration and scale for clusters of industries and other non-agricultural economic activity, the urban sector will become the principal engine for stimulating national economic growth. Industrialization will absorb more people as India advances further in its integration with the world economy. At the present juncture, India faces the challenge of continuing on its high growth trajectory while making growth more broad-based and labour intensive. The fortunes of the agricultural sector are crucially linked to the manner in which growth in the industry and services sectors unfolds. People living in rural areas typically tap the opportunities that cities provide for employment, entrepreneurial avenues, learning, and monetary remittances. As urbanization grows, demand for food items other than food grains, i.e. vegetables, lentils, milk, eggs, etc., also grows. This leads to investments in infrastructure, logistics, processing, packaging, and organized retailing. These investments and other economic interlinkages contribute and build

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synergy between rural and urban centers. Of course, government policy should also focus on enhancing the productive potential of the rural economy. From the report, that India's urban future promises to be an inclusive one, with the benefits extending to rural areas as well. Already, there is evidence to suggest that rising standards of living in India's urban areas in the postreform period have had significant distributional effects favoring the country's rural poor.

Occupational Pattern:

According to Census 2011, there were 49.81 percent cultivators, 8.73 percent agriculture laborers, 2.26 percent engaged in household industry and the remaining 39.20 percent engaged in other works in the district. The district provide the livelihood to maximum number of people in the district. To assess its industrial potential, it would be worthwhile to explore the land-use pattern, irrigation facilities, crops, livestock, dairy, cattle development etc. This will provide a broad spectrum of resources inventory and resource base, on which foundation of industrial growth are generally laid down. If weclassify occupational pattern of working force between males and females, this comes outto be as follows:

Working Force in Sikar District, 2011

		Main workers			Marginal workers			Total workers		
		Males	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**
1	Cultivators	207912	105318	313230	49712	138369	188081	257624	243687	501311
2	Agricultural labours	30955	11444	42399	19650	25840	45490	50605	37284	87889
3	Household Industry	13023	3298	16321	2209	4246	6455	15232	7544	22776
4	Others	294288	32473	326761	40105	27662	67767	334393	60135	394528
	Grand Total	546178	152533	698711	111676	196117	307793	657854	348650	1006504

Human Development Index (HDI)

Human Development Index (HDI) which provides a composite measure of mainly three dimensions:

1. A decent level of living(Per capita income)
2. Living a long and healthy life
3. Access to education

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Comparison Human development index of Shekhawati region and Sikar by Rajasthan (2008)

Districts	Education Index	Health Index	Income Index	Human Development Index
Jhunjhunu	0.850	0.850	0.433	0.711
Sikar	0.837	0.830	0.428	0.698
Shekhawati Region	0.844	0.840	0.431	0.705
Rajasthan	0.755	0.735	0.640	0.710

Source: HDI, Institute of development studies, Jaipur (2008)

It reflects from the above table 4.1.5 HDI (2008) that education index of Shekhawati region is 0.844 which is higher than the educational index of Rajasthan (0.755) having a difference of 0.089. Health index of Shekhawati region is 0.840, where as health index of Rajasthan is 0.735. Thus, health condition of human resource dewelling in Shekhawati is quite good as compare to state and Income index of Shekhawati region is 0.431, whereas income index of Rajasthan is 0.640 which is higher than Shekhawati region. It means that require developing more infrastructure facilities to raise income level of the study area. The HDI of of Shekhawati region is 0.705, whereas HDI of Rajasthan is 0.710 which is 0.005 higher than Shekhawati region. But there are two variables of HDI i.e., educational index and Health index of Shekhawati region are quite higher than Rajasthan"s variables. Thus overall education and health parameters of Shekhawati region are good thus we can concludes that human resource of Shekhawati region will be future contributor in nation building.

2.9 Traditional and Indigenous Knowledge

2.9.1 Traditional Uses of Plants

Indigenous Huts

Wood or timber is a fundamental part of the traditional life particularly in the construction of shelters. Folk people designed their dwellings according to the available material and prevailing environmental conditions. Locally available plants are used for the construction of the skeleton of the hut. The later consists of pillar, beam, poles, wall, roof, doors and thatch etc.

During the survey in the nearbyvillages of Beer conservation Reserve, circular type of huts with conical roof wasobserved. There are usually no windows in the huts (*Jhumpas*).

The entrance to the jhumpa is low so that one has to bend before entering. Apart from a low door, thereis no opening in the structure. Fodder and grains are also stored in specially built jhumpas. A shelter made from bricks with thatched roof "*Chhan*" was also a common feature of the rural area. The cattle are tied at one corner of this "*Chhan*". Sometimes, it is used as kitchen. A special type of hut "*Khara*" made of mud with thatched roof is used to containing food items. The walls are covered with plaster of clay, cow-dung and hay making a termite free (antiseptic) facade (Plate – 5.4). The wood of various plants used in the construction of huts are: *Acacia*

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nilotica, *Salvadora oleoides*, *Tecomella undulata*, *Zizyphusnummularia*, *Clerodendrum phlomidis*, *Calotropis procera*, *Saccharum munja*, *Crotalaria burhia* and *Leptadeniapyrotechnica.*

Agricultural Implements

The agricultural implements consist of plough, harrow, levellers, cold crushers, seed drillers and hoes. Besides, there are several other implements like *kuhad*(axe), *kulhadi*(pick axe), *favda*(spade), *Khurpi*(weeding hoe), *dantali*(rake with wooden teeth), *dortii*(sickle) and *paner*(crowbar). The wooden part of these implements is made from locally available plants.

Sower(*Orna*)

This agricultural implement made of hollow bamboo is used by the farmer for sowing seeds like bajra, wheat, juwar, moong etc. It is tied behind the plough and seeds are dropped into the conical mouth, trickle down to the furrows.

Land – levellar (*Pata*)

It is used for levelling the ground evenly so as to maintain and preserve the moisture content of the field. A levellar is also employed for covering seeds after broadcasting. Normally wood of *Acacia nilotica* is used for levellar.

Plough

Plough is an agricultural implement which is used to cut the soil and make it suitable for the process called seed sowing. Indigenous plough is made up of wood with an iron share point. It consists of body, shaft pole, share and handle. It is generally drawn with camel in Jhunjhunu district. The horizontal part of plough is made up with wood of *Acacia nilotica* and *Acacia leucophloea*.

Harrow

After the ploughing, harrow is used to break the clods. It fundamentally consists of a long metal blade fixed to the lower end of a wooden plank. These were originally drawn by draft animals, but in modern practices, they are trailed after the tractor by a drawbar. The wooden plank is made of wood of *Acacia nilotica*.

Pulley(Bhuun)

A pulley is used to draw water from the well. It is made of *Acacia nilotica* or *Prosopis cineraria* wood. The pulley is mounted on two obliquely placed poles of *Acacia nilotica* or *Tecomella undulata* converging at the upper end where it is fixed and held in place by two upright sticks. The *patia*(a wide slab of wood) is fixed above ground over the mouth of well with the aid of two pillars called *khambas* made of *Dalbergia sissoo*, *Acacia nilotica*, *Prosopis cineraria* and *Tecomella undulata*. The sticks assisting the pulley are fixed on these *khambas*.

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Transport

WheelBarrow

It is a simple construction used to carry grains, fodder and wood from one place to another. It is composed of two small wheels tied to the yoke with the help of two diverging sticks and tied to the camel or oxen. The wheel is constructed from the wood of *Dalbergia sissoo* and *Tecomella undulata*. Bully is constructed from the wood of *Acacia nilotica* and *Azadirachtaindica* .

Protection from Farm enemies: Fencing

Boundaries for houses and land holdings, called Baras, are made of the dry branches of thorny bushes, a deterrent for straying cattles. About five to six feet high thorn fencing is put around the compound to ward off animals, thieves and also as protection against strong wind. Spiny stem and branches of *Zizyphusnummularia*, *Acacia nilotica*, *Acacia catechu* and *Capparis decidua* are tied with the aerial roots of *Ficus benghalensis* or with young shoots of *Leptadeniapyrotechnica*for fencing around the house. *Saccharum munja, Opuntia elatior*, *Ipomoea fistulosa* and *Maytenusemarginata*are used for field fencing.

Machan

A temporary hut erected on poles, *machan*, is formed to protect the crops from wild animals. It is formed from wood of *Acacia nilotica*, *Zizyphusnummularia* and *Prosopis cineraria*.

Gate for huts (Jhanto or Jhanti)

A fencing using various live plants or dead ones or their wood is generally seen on the opening of a hut which forms the gate. Vertical support of the gate is made of *Tecomella undulata*, *Clerodendronphlomoides*or *Lyciumbarbarum*and tied with ropes of *Leptadeniapyrotechnica*

2.9.2 Household Articles:

Grain Grinder *(Chaki)*

Indian traditional grinder *"Chaki"* or *"Ghatt"* is made of two circular stones in opposing pairs to crush grains. This is the simple way of making flour. The wooden handle of *"Chaki"* is made from wood of *Tecomella undulata* or *Dalbergia sissoo*.

Wooden Mortar and Pastle Set

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Wood of *Acacia catechu, Azadirachta indica and Dalbergia sissoo* are chosen for making a pestle. Mortar is made of the wood of *Acacia leucophloea, Acacia nilotica* and *Albizia lebbeck*.

Butter Churn (*Bilona Stand and Jherna*)

A butter churn is a device used to convert cream into butter. A traditional butter churn is operated by the pulling the rope to spin the churning stick inside the narrow neck clay pot. Butter churn stand is made from wood of *Prosopis cineraria*, while churning stick is prepared from roots of *Zizyphusnummularia*.

Winnowing pan *(Chhajlo or Supra)*

It is used for removing chaff from grains by the rural ladies. The flowering scape and culms of *Saccharum munja*are woven into winnowing trays (*Chhajlo*), which is used for cleaning grains.

Brooms

Different types of brooms made up of plant materials are used by folk people. The stalk and culm of the inflorescence of *Desmostachyabipinnata, Saccharum munja*and *Saccharum spontaneum*are used for broom. Stem and branches of *Leptadeniapyrotechnica*, *Sida ovata* and leaves of *Phoenix sylvestris* are also used for making broom.

Cots and Ropes

Sheath blade of *Saccharum benghalense*is beaten and used for making ropes (*Munj*). These ropes are employed for cots. Vertical, horizontal and base parts of cots are made from stem of *Zizyphusmauritiana, Azadirachta indica, Acacia nilotica, Dalbergia sissoo* and *Tecomella undulata*. Legs of cots are made from *Dalbergia sissoo, Acacia nilotica* and *Tecomella undulata*. Young branches of *Leptadeniapyrotechnica*are employed for making ropes. These ropes are used by rural people to tie the stack of grasses and a circular ring made from these ropes is used to form *haari*on which pots are placed.

2.9.3 Miscellaneous Articles

Rakhwala*or *Bijuka

To protect the grains form birds and animals various kinds of figures resembling human are erected in the crop fields in nearby villages. Two wooden sticks of *Prosopis cineraria* or *Acacia nilotica* are tied in cross like manner and planted in the ground by tying grasses and leaves to these sticks gi[illegible] the shape of hands. Earthen pot *(Matka)* is placed in reverse position as head. The wooden framework is decorated by putting old clothes of farmers (*dhoti, [illegible]ta, safa*or

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payjama). They are known by several names *Bijuka, Darawa, Howa or Rakhawala* etc.

Musical Instruments

Time immemorial some old traditions followed in the regions is a boom for the local populations. Conventionally the people inhabiting the Shekhawati region of Rajasthan were known for their love for music and style of singing. The tribals and rural people are fond of songs and music. Here are a few local instruments frequently used in traditional Rajasthani folk music.

Chang* or *Dhap

The chang provides the beats for a festive singing and dancing tradition from the Shekhawati belt of Rajasthan and genre *'Chang Nritya'* gets its name from the principal instrument so employed. *Chang* comprises of a circular, shallow wooden frame and at times is also a pentagon. It is mounted with leather on one end and is lift open on the other. The bottom of the palms provide the base while playing the *Chang* and the treble is generated by small pencil thin sticks that are used to strike the leather surface. Players carry the *Chang* as they sing, dance and play it simultaneously. Shekhawati region is famous for *'Chang dance'* which is starts from the Maha Shivratri festival and ends on *Dhulandi*, day after the Holi festival.

Dhol

It is a very popular folk drum instrument of music. It produces very powerful sound and is mainly used by *'Rana'* or *'Dholi'* community on the occasion of festival of Gangaur. The dhol is a barrel shaped drum made up of wood of *Azadirachta indica, Dalbergia sissoo* and *Mangifera indica*. They have parchments of animal skin on both the ends held by strings. Normally a 'Dhol' is "18 to 20" inches in length and 12" in breadth. Dholis hang their Dhols from the shoulder or place it on their lap and play it with one or two wooden sticks that are made of *Calotropis procera*or *Clerodendrum phlomidis*.

Flutes

Tribal flutes are made up of *Denrocalamus*. A flute or bansuri is a simple cylindrical tube of uniform bore and vary in size. It is held horizontally and is inclined downwards when it is played. To produce melodious sound one has to cover the finger holes with the fingers of the left and right hand. Variations in pitch are produced by altering the effective length of the air column.

Dholak

Dholak is a very popular folk drum of tribals as well as in of[illegible]rn India. It is barrel shaped with a simple membrane on the right hand side. Dholak is just a smaller version of the dhol. The left hand side membrane has a spe[illegible]ating of the inner surface (dholak masala), which lowers the pitch and provides a well

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defined tone. Both ends and wooden body is tied with strips of *Dendrocalamus strictus*. The wood of *Acacia nilotica*, *Azadirachta indica*, *Dalbergia sissoo* and *Mangifera indica* is used in this instrument.

Tambura

The tambura is a stringed instrument that is played as a folk instrument by tribals. It is one of the long neck lutes. It is usually stringed with 4 or 5 metal strings. The instrument is played by plucking the string with ones finger. Long piece of wood is attached over rounded part of the body. The wooden materials used for the construction of the body are*Acacia catechu*, *Mangifera indica*, *Moringa oleifera* and *Dalbergia sissoo*.

Algoza

Algoza is a pair of wooden flutes and the player works the Algoza by alternating three fingers on the holes on each side. A vigorous and swinging rhythm is created when the player breaths into the algoza rapidly. Hollow dry stem of *Calotropis procera*or bamboo are used for the pipes of the instrument which may be tied by string or held at an angle**.**

Ravanhatha

Ravanhatha is an ancient bowed violin. The bowl is made of a cut coconut shell that is covered with goat hide. A long piece of *Dendrocalamusstrictus*is attached to this shell. The two main strings are made of steel and horsehair respectively. It is played with a curved bow of horse tail hair draw across the strings with rhythmic jerks. It is held by the left hand, the resonator resting on the left side of the chest.

Fun with Plants

Wooden tricycle (*Gadula*)

A trick made up of three wooden wheels which are attached to each other with three flat wooden piece of *Prosopis cineraria* or *Acacia nilotica*. Sometimes it is made by *Tecomella undulata*. This tricycle will be fun for baby from about a year old. The toddler pushes it with the built in handle and learn to walk.

Slingshot (*Gulel*)

It is a Y shaped toy which requires a Y shaped stick, some rubber bands or rubber cut from old inner tube, small diameter string and some old shoe leather or suitable material to make a small pouch to hold projectile. The hardest part of making the slingshot is finding good handle. *Maytenusemarginata*is commonly used for making gulel in the study area, because it has a lot of forked limbs and the wood is light weight and strong. Children used this gulel for running away birds, because they spoil their foodgranis and fruits.

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Pupadi

The leaves of *Ficus benghalensis*, *F. religiosa* and *Holoptelia integrifolia* are folded and held between the lips and blown like a whistle. This is the simplest musical instrument of rural children.

Toy Truck (*Gadi*)

Rural children played with self made toy truck trailed by them on the roads. Wheels are made of wood of *Acacia nilotica* or *Prosopis cineraria*. Sometimes wheels made of iron wire or rubber is also used.

Gilli – Danda

Children play on ground with gilli-danda, made from wood of *Prosopis cineraria*.

Bow and Arrow (*Tir-Kaman*)

Children play with self-made bow and arrow. It is made of wood of *Morus alba*.

Swings *(Hindo)*

Rope Swings are created by tying one end of a length of rope to a tree branch. A knot or loop is usually put on the other end to prevent fraying and help the swinger stay on. A wooden plank, made from *Acacia nilotica* or *Tecomella undulata* is suspended on both sides by ropes from a tree branch.

Plant Species in Rituals

Many plant species are utilized in different traditional magico-religious by the folk and rural people inhabiting near Shakambari forest area. Traditional socio-religious information of plant species used in different rituals was collected through participation in ceremonies and semi-structural personal interview with the knowledgeable elderly people. The collected plant species were carefully identified and enumerated with the help of relevant scientific literature.

2.9.4 Wild Edible Plants

The Beer protected forest is enriched with many wild edible plants which are still consuming more or less by tribal and rural people inhabiting near the area. Information regarding the utilization of wild edible fruits and vegetables were obtained through interview, field observation and group discussion. The wild edible plant species are arranged alphabetically along with their botanical name, local name, family and their usage.

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Chapter 3
Present Management and Practices

3.1 Management History

3.1.1 General History of Forests:

This area has been a part of Sikar Forest Division, Sikar Forest Division was created in the year 1980. Before the year 1980, the forest area of this forest division was a part of Jaipur Forest Division.

In the year 1885, Shri E. McMoyer was appointed Deputy Forest Conservator, North Western Region, by the Government of India on the request of the State Government to discuss about forest conservation. Shri Moyer conducted a thorough inspection of the forests of the state and divided the forest area into 4 divisions, Northern, Southern, Eastern and Western Divisions. He divided the forests into 3 categories.

(a) First Class Forests (Class I Forests) Grazing was completely prohibited in these areas.

(b) Second Class Forest (Class II) Area opened for free or paid grazing by limited animals.

(c) Third Class Forest (Class I) Illegal felling was prohibited in this area, but grazing was allowed.

He laid special emphasis on protection from forest fires and demarcation. He advised to implement the 'Bhavnadantk' system for the management of forests. He also mentioned conservation treatment (Bhavnadantk) and afforestation work at a limited level. For plantation, he advised to plant seeds of mango, jamun, sheesham, bamboo and local species like babool, khejri, kheri, siras, ronjh etc.

For the management of these forests existing at present, in the year 1923, Shri G.A. Karol Forest Superintendent expressed the need for a forest policy which was the first attempt made for forest conservation. For the management of forests, he appointed some forest staff and established nurseries. He proposed annual pruning and thinning every five years. He also suggested that plantation areas should be effectively closed for grazing for 5 years.

In 1926, he prepared a forest management system and started exploitation by making some pits (Bavancham). Since the sequence of exploitation of forests was not determined in the system, good forest areas were exploited. Besides, due to unscientific felling of trees, tall stumps were left and due to ineffective fencing, new branches were destroyed due to illegal grazing. This had very disastrous adverse effects on regeneration.

During November 1936, the Government of India appointed Mr. H.S. George, IFS, Deputy Forest Conservator, Central Zone, Jaipur State. He suggested that the forest areas should be surveyed on a map of 4 inches per 1 mile scale by the Indian Survey Department and that forest boundaries should be determined. Various rules were also made regarding the removal of dry wood and thorny bushes, cultivation of lac, removal of Kadaya lap, etc.

Forest Manual was prepared in 1937, which mentioned various types of instructions like the structure of the forest department, duties and standards of the staff, [illegible], constitution of State Forest and its determination, etc.

In 1940, the control of the forest department remained under Colonel K. D. Singh. Colonel Kesari Singh developed hunting grounds, so that some selected plants should be

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selected and managed only for wildlife. The forests of Sikar and Khetri bases were managed by their private forest departments and sometimes only technical advice was given by the Forest Conservator, Jaipur.

3.1.2 Past methods of management:

Earlier, the forest area was managed by the general coppice system. The rotation period of which was fixed for 30 years. There were no annual copses prescribed in any regular felling category. In 1937, permits were issued for commercial cattle rearers like Banjara etc. at the following fees -

1. Cow - 06 paise/cow unit/per year
2. Buffalo - 12 paise/cow unit/per year
3. Camel - 50 paise/cow unit/per year
4. Goat 12 paise/cow unit/per year

Forest areas were divided into the following 3 sections -

- Class - I (Class I): This class included all such areas in which strict control management was to be implemented so that scientific exploitation and reproduction could be done. Grazing was prohibited in these areas.
- Class - II (Class II): This class included all such areas which were in transitional stage (transitional) and which were proposed to be converted from second class to first class after land conservation works. Controlled grazing was allowed in these areas.
- Class-III (Bhuttam): All such remaining areas were included in this class in which the possibilities of improvement were weak, in which it was not possible to get work done nor it was possible to stop grazing. At the time of Jagir abolition, leases were issued to contractors of good forest areas at a nominal fee. Some areas were initially completely cleared by felling (Basmantmisad) but later felling work was started by making an executive plan.

Special works for improvement in forest areas:

During the year 1945-46, forest checkpoints were also constructed at many places during the time of Colonel Bhairu Singh for the plantation of species like Dhaunk, Acacia, Neem, Juliflora etc.

Under Sikarrange, the area of controlled sandy areas which were later declared as grass, beed and protected forest block was managed. In this area, research plots were set up for vilayatibabool (*P.juliflora*), churel, mulberry, faras and grasses like antropogon, sevan, dhaman, karda, panicum antidotel etc. Shelter belt plantations of species like sirus (*A.lebbeck*), neem, vilayatibabool etc. were done near the office of Jaipur Collectorate. Deputy Inspector General Shri J.M. Banerjee inspected these plantations and appreciated the work and suggested to expand similar works elsewhere as well.

After the formation of Rajasthan in 1950, many reform works were [illegible] such as afforestation work in those areas which were affected by [illegible] Jagir forest areas, creation of pedox, soil conservation work in various areas, commercial

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plantation work was done. During the implementation of various five-year plans, old nurseries were expanded and new nurseries were created to prepare a good amount of plants.

(1) Nursery and plantation work - The afforestation works were done in these forest areas, along with this a nursery was created near the Sikar Range Office.

3.1.2.2 Period from 1966 to 1980

For the first time in the history of forest management of Jaipur district, a plan for scientific management of forests was prepared by Shri Verma ji. Forest blocks and divisions were marked on GT sheets. Their boundaries were determined in the prescribed area and the history of the divisions was recorded.
The main objectives of Shri Verma's work plan were to improve the condition of grass/pastures by including high quality grass species and cyclic grazing. To give importance to the protection and conservation of wildlife for economic prosperity and entertainment. To ensure the receipt of maximum and continuous revenue and produce from forests in accordance with the scientific principles of forest policy. To achieve these objectives, the following forest management circles were structured:-

1. Coppice with Standard Management Circle (CMS)
2. Rehabilitation Management Circle (RTM)
3. Improvement (Overlap) Management Circle (IMO)
4. Plantation Management Circle (Plantation Management Circle)
5. Grass and Grazing Working Circle Circle (Grass-Grazing Management Circle)

This management circle was formed to provide facilities for production of grass and grazing to cattle.
Main objectives:
1. To fulfill the demand of grass/grazing of local people.
2. To increase production capacity by planting high quality grass species, shrubs and tree species in the grass beds.

Treatment method:
1. Grass cutting should be prohibited between February and September.
2. Grazing should be prohibited from 1st July to 30th September every year.
3. Under the proposed rules, pruning of species like Khejri, Ronj, Chhila, Ber, Babul etc. should be done.
4. Dead and dying plants should be removed.
5. Planting of grass species that do proper soil work and give more yield and more valuable tree species should be done.
6. Maintaining the capacity of grass beds by promoting cyclic grazing.

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Wildlife Management:

Details of wild animals were mentioned in detail in Verma ji's work plan and the importance of wildlife protection was accepted and emphasis was laid on their preservation and strict restrictions were laid on the trade of wildlife horns, skins and trophies. It was proposed that hunting of unwanted wild animals should be done only by valid license holders. Proposals were given for the development/improvement of the zoo. The work of maintaining wildlife was done by the State Forest Department as per the availability of budget provisions and later in the year 1972, Wildlife Protection Act 1972 was implemented for effective protection of the wild animals available in the PA.

3.2 Habitat Management and Protection

3.2.1 Management Period from 2012 to 2022

Biodiversity conservation, ecological conservation, wildlife conservation, soil and water conservation, recreation and tourism forestry as well as the concepts of sustainable forest management (NSM) are the main points of forest management plan which are given top priority in the current forest policy in the current era. Along with all these, if any forest produce is to be extracted or exploited, then keeping in mind the future generation, it should be done only for the needs of the local residents while giving priority to the concept of sustainable management and keeping in mind the current forest policy that the exploitation of forest produce should not be done on economic priority, it is necessary to make current forest management plans in which the need of local public participation and public education should be made a part of forest management, which is a part of the current forest management plans.

The origin of the concept of the above mentioned points, facts and factors in management is the result of global thinking today, the detailed description of which is given below.

Objectives propounded in the present context

- To increase the quality and density of forests by natural regeneration and plantation of existing forests for environmental protection and soil-water conservation.
- To conserve forests for land conservation, climate improvement, beautification, beautification and recreation.
- To maintain the capacity of dams and reservoirs by making proper improvements in catchment areas.
- To produce high quality nutritious fodder by increasing the productivity of pasture land.
- To create suitable shelter and suitable environment for the protection and development of wild animals of the area by improving local conditions.
- To get the cooperation and participation of the public in the protection and development of forests. To protect, conserve and develop the forests of Rajasthan with the active participation of local communities [illegible] ecological security of the human community. To increase the productivity of forests by using

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accurate management measures and modern technology to meet the demands of the present and future generations.

- To create interest in forests and wildlife among the public by promoting ecological tourism without adversely affecting forests.
- To conserve the diversity of flora and fauna and gene pool of protected areas by increasing the number of national parks, sanctuaries, 'protected areas' and 'community reserves'.
- Prosperity through biodiversity: Along with biodiversity conservation and management in ecosystems such as grasslands, forests, wetlands etc., to conserve rare and endangered flora and fauna species in the district through local and ex-local measures.

Wildlife related agreements:

Apart from the above, there are many other agreements, documents and conferences which are internationally valid on the subject of forest resources and management and according to which it is desirable to manage forests and wildlife in the country. Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), the Convention on Migratory Species (CMS), Convention on Biological Diversity (CBD).There are many international agreements like the International Monetary Fund (IMF), which directly affect forest and wildlife management. Biodiversity Convention contains many methods for the conservation of forest-related biodiversity.

Economy to environmental stability:

In this forest policy, for the first time, "environmental stability" has been considered as the main objective and direct benefits have been considered under this main objective. The first charge on forest produce is considered to be of the people living in or around the forests and dependent on it. It is also believed that rights and concessions should be according to the carrying capacity of the forest.

Grazing:

In this policy, importance has been given to forest management with public participation instead of security-based forest management. There is an emphasis on sharing all the benefits of forests with the public. Even for a sensitive activity like grazing, a policy has been formulated to control it with public cooperation. To reduce the pressure of grazing, emphasis has been laid on planting fodder trees and plants. According to the forest policy -
"The law should be changed, wherever necessary, to encourage individuals, institutions to plant trees and fodder trees, grass etc."

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Fuel and firewood:

In the forest policy of 1952, for the first time, it was desired that farmers should be encouraged to plant trees on their own land to supply firewood and fuel in the country. In the new forest policy, it has been desired to go further and develop barren and degraded forest land for firewood and fodder and plant trees. The intention has been expressed to bridge the gap between demand and supply of firewood and fodder by increasing the productivity of forests. According to the forest policy -

"It is the necessity of the country to have a massive tree plantation and plantation program based on needs and time bound, for fuelwood and fodder development, on all the defined and uncultivated forest and non-forest lands of the country."

Essentials of forest management:

- The existing forests and forest lands should be fully protected and their productivity should be improved.
- In view of the increased food requirements, marketing of good and productive agricultural lands for forestry should be discouraged.
- To conserve the entire biological diversity, the network of national parks, sanctuaries, biosphere reserves and other protected areas should be strengthened and expanded substantially.
- To prevent depletion of forests beyond sustainable limits, adequate fodder, fuel and pastures should be provided in the vicinity of forest areas.
- Efforts should be made to improve and increase the protection and production of minor forest produce in relation to employment and income generation.

Area under Forest:

The national goal should be to bring at least one-third of the total area of the country under forest or tree cover.

Forest Protection and Conservation

- Districts namely Ajmer, Bharatpur, Bhilwara, Dausa, Dungarpur, Ganganagar, Jaipur, Jhunjhunu, Pali, Rajsamand, Sikar and Sawai Madhopur are such districts in which forest area is between 5 to 20 percent. Apart from increasing the forest area in these districts, afforestation will be undertaken on wastelands owned by State, Community and Private on an ambitious basis to fill the gap between the desired green area and the available green area.
- Mining in forest areas should be discouraged in all forms. Mining causes irreparable/incalculable damage to forest areas apart from [illegible]. Hence, judicious decision should be taken for permission of mining operations. Illegal mining in forest areas in Rajasthan can be controlled by increasing joint inspection and supervision of Mines, Forest and Police officials. Intelligence system can be

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developed to prevent illegal mining in forest areas and the person giving information to stop illegal mining activities in forest areas should be rewarded while keeping his identity confidential. Sand stone mining associations should also be motivated to do compensatory plantation in the demarcated forest areas. Mines department should be pressurized to carry out reclamation work in previously mined areas at the expense of the miner.

- The problem of encroachment in forest areas persists throughout the year. Slums are built in the vacant forest land near urban areas. The work of clearing such areas will be done on priority with the help of urban bodies. To prevent entry into such sensitive forest areas, concrete walls will be built on their borders. To remove encroachment in remote forest areas, action will be taken both through persuasion and coercion. Generally, incidents of encroachment in forest areas occur immediately after the monsoon. Therefore, to prevent and minimize this problem, patrolling and effective maintenance system will be strengthened.
- Most incidents of forest fire in Rajasthan occur in summer. Past experience makes it clear that these fires spread due to burning of grass and bushes on the ground. To prevent forest fire, construction of fire lines and their maintenance at regular intervals is necessary. Subordinate forest personnel will be provided such small equipment with which fire can be controlled by extinguishing or controlling it. Members of the Joint Forest Management Committees and local people will be obliged to help in extinguishing the fire.
- During the rainy season, large scale soil damage occurs due to illegal grazing in forest areas, due to which good forest areas turn into barren rocky land and these are not suitable for natural regeneration. At this time, small plants are grazed and these plants are also crushed. During the rainy season, apart from local livestock, migratory animals also cause large scale damage to forests, hence the damage to our natural forests can be reduced by increasing grazing fees, improving animal breeds, controlled grazing, cutting and taking away grass at nominal fees and encouraging grazing of animals on pegs and developing pastures through joint forest management.
- Illegal cutting of trees in natural forests and transportation of this produce is helpful for the local citizens, but this tendency increases a lot during famine. There is already a shortage of firewood in Rajasthan, hence the transportation of this product should be stopped by setting up check-posts and barriers on inter-state borders/district borders.
- Wild animals outside natural forests and forest areas are hunted illegally for domestic and international trade of wildlife parts and other products. There is a lack of adequate infrastructure to stop this illegal hunting. To reduce illegal hunting, it is necessary to increase patrolling, keep vigil and develop a crime intelligence system.
- To prevent forest crimes, inter-departmental coordination with revenue, police, mining, industry department, animal husbandry, transport, research institutes and laboratories is necessary.
- The security staff of the forest department is inadequate in proportion to the increase in human intervention in forest areas in the past years. There has been a change in the working standards of security personnel for a long time. There has been no regular

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recruitment on lower posts in the last two decades. Beat guards are under pressure to look after 10 to 15 sq. km. forest area instead of 5 to 7 sq. km. Nearly one third of the subordinate level posts in the department are vacant and the age of the employees working is also increasing, due to which the security of forests is in danger. Forest criminals who have the latest weapons and equipment to commit crimes like high speed vehicles are also a threat to the security of forests.

- The forest guards do not have modern equipment to deal with the aggressive attacks of the forest forces, which are a strong organization. The morale of the forest guards is low due to the lack of a reward and incentive system that is in practice in the police department. The condition of flying squads is also not satisfactory as they do not have enough vehicles and adequate financial resources for the maintenance of vehicles. Increasing the number of guards and strengthening the infrastructure is very important for the protection of forests and wildlife.

Wildlife Conservation:

- At least five per cent of the total geographical area of the state should be made a reserved/protected area for the conservation of biodiversity.
- The biodiversity inventory of each of these areas will be carefully prepared. In this list, classification of extinct, endangered and rare species on the verge of extinction will be done as per the criteria of International Union for Conservation of Nature and Natural Resouces (IUCN). It will be recommended to include such flora and fauna in Schedule-III of Wildlife Protection Act, 1972.
- Conservation will be planned in both the ways i.e. in-situ and ex-situ. As an in-situ measure, corridors will be developed for the free movement of wild animals between the series of national parks and sanctuaries wherever necessary under the provisions of National Wildlife (Protection) Act, 1972.
- The boundaries of protected areas will be determined judiciously with the objective of minimising conflict with people living near protected areas.
- The existing wildlife habitat areas will not be divided further.
- Each protected area will be managed scientifically as per the management plan. In this management plan, activities like habitat improvement, control measures, controlled tourism and food chain etc. will be outlined which can be monitored and if required, can be amended with the approval of the competent authority.
- Eco-development committees will be formed for the protection and conservation of protected areas. These committees will take the responsibility of developing the nearby non-forest area so that dependence on protected areas can be reduced. Skill development activities will be conducted for the nearby communities to adopt alternative livelihood resources for earning income.
- Wetlands outside forest areas will be identified. Efforts will be made to develop them so that hunting of migratory birds can be stopped.
- Veterinary services in the department will be strengthened to prevent the [illegible] infectious diseases of wild animals and to fulfill their health related nee[illegible]

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- Long term and short term measures should be taken to control human-animal conflict. Innovations should be developed for rehabilitation and protection of wild animals roaming outside forest areas.
- Regular awareness system of species and their habitats will be developed.
- To prevent diseases spreading among wild animals through domestic animals, effective vaccination program will be taken up for domestic animals in the areas adjacent to the protected area with the help of Animal Husbandry Department.
- With the objective of reducing grazing pressure on forest areas, breed improvement program of domestic animals living near protected areas can be taken up.
- The weakest link in the field of biodiversity conservation is lack of education and public awareness. Therefore, with the help of specially trained personnel and non-government organizations, an intensive program of nature interpretation, education and dissemination will be started. An interpretation and education center will be set up in every protected area with adequate dissemination facilities. In such public awareness programs, special attention will be focused on school studen

Forest damage due to Encroachment, fire and Grazing:

- Effective measures should be taken to stop the increasing encroachment on forest land. Existing encroachments should not be regularized. If years old permanent houses have been built in some forest areas, then they should either be demolished or if this is not possible, then reversion proceedings should be initiated.
- Strictly close the access roads to the previously mined areas and destroy them and get land conservation and rehabilitation work done on them.
- Modern and developed systems should be used to deal with forest fires.
- Grazing in forest areas should be regulated with the help of the community. Specially protected areas, young plantations, regeneration areas should be kept completely safe.

Biodiversity Act 2002 and Rules 2004:

- India being a participant in the United Nations Biodiversity Convention established as a result of Earth Summit 1992, respecting the provisions of the said convention, this Act was formulated by the Central Government in which the process of access to biodiversity and biological resources of the country, their extraction, use and exchange of knowledge related to them and the process of just, fair and equitable sharing of benefits derived from them etc. have been regulated.
- There is a provision for formation of empowered committees at various levels for implementing the provisions under the said Act as follows:
  At National level - National Biodiversity Authority
  At State level - State Biodiversity Board
  At Local level and Gram Panchayat level: Biodiversity Management Committee
- There is provision for establishment of Biodiversity Fund at all the levels. There is provision for imprisonment up to five years and fine up to te[illegible] rupees for violating the provisions of the Act. The offence committed under Act is cognizable and non-bailable. This Act will remain effective along with other Acts.

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Under the Act, the Central Government is empowered to declare sites of biodiversity importance as biodiversity heritage sites and to notify endangered species. Biodiversity Rules 2004 have been implemented from 15 April 2004, in which the process and rules regarding various provisions of the Act are described in detail. The Act has 12 chapters and 65 articles.

Wildlife (Protection) Act 1972 and Wildlife (Protection) Amendment Act 2002:

In order to control the continuous decline of wildlife, their increasing hunting and illegal trade in the country in the past years, extensive amendments were made in the original act in 2002 and it was made more stringent. After the amendment, along with providing more powers at the level of Assistant Forest Conservator, provision was included to create protected areas on government land with the cooperation of the community and to create community protected areas on private and community lands. Punishment and fines for wildlife related crimes have been increased and special provisions have been made to curb the tendency of criminals to get bail. Provision has also been made for the formation of National Wildlife Advisory Board and State Wildlife Advisory Board to monitor the status of wildlife at the highest level. Special provision has also been made in the amendment for the acquisition of wildlife products or property obtained illegally. Through this amendment, provision has also been made for the formation of Indian Zoo Authority for the supervision of zoos across the country, protection and conservation of rare and endangered animals and plants, and personal right to file a case against the criminal. The Act has 11 chapters, 121 articles, and 6 schedules of lists of animals, birds and plants.

Public Participation:

- As far as possible, development work in forest and non-forest areas will be done through joint forest management committees. The state government, keeping in view the difficulties and developments experienced in relation to shared forest management, will issue proposals for shared forest management in a timely manner after consulting all stakeholders. The department will also issue guidelines to bring uniformity in the work of its subordinate offices. In this regard, the possibility of making rules under the Rajasthan Forest Act will also be explored.
- Joint forest management committees will be classified into highly active, active and inactive committees on the basis of predetermined information, by conducting timely enlightenment. Active and inactive committees will be empowered to reach the higher class.
- Alternative sources of livelihood will be made available to forest-dependent communities through self-help groups. Skill enhancement will be done through continuous efforts of these groups. They will be encouraged to set up small scale industries for income generation and for this they will be provided with "seed money". Common Forest Management Committees will be encouraged to develop

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their own corpus fund so that they can maintain/take care of all the physical assets created in the area including tree plantations.

- The Forest Department will try to increase the active participation of women and members of other backward classes in the decision making process.
- The members of the committees will be specially trained in accounting, conflict resolution and silviculture methods.
- The committees will be provided technical, socio-economic, managerial and institutional support to bring stability in common forest management.
- Public private partnership will be encouraged for the management of forest areas in accordance with the forest policy laid down by the Government of India. Tripartite agreements will be made between the concerned industry, forest department and common forest management committees for tree plantations being done for specific objectives.
- The three-tier awareness system at the divisional, district and state levels in the state will strengthen common forest management. Non-governmental institutions can act as catalysts in the common forest management program.
- In compliance with the new "National Forest Policy" issued in 1988, the State Government issued State Order No. F 7(39)75/90 Jaipur, dated 15 March 1991 with the objective of getting the participation of villagers and voluntary organizations in making the degraded and treeless forest areas green again. Thereafter, the State Government issued State Order No. F 7(23) Forest/90 Jaipur, dated 26 April 1991 under which the process of getting cooperation from local residents in tree plantation done on Panchayat land, pasture and government fallow land in rural areas was determined. In this, the formation, functioning, responsibilities etc. of the village level forest protection and management committee were determined and a system for distribution of forest produce was also established. Later in the year 2000, all the previous orders issued in this regard were amended and the State Government issued State Order No.No. 7(39) Forest/90 Jaipur, dated 17.10.2000 was issued. At present, shared forest management is being operated under this State Order. In this State Order, apart from treeless/defended areas, many rights and concessions have been provided to the committees active in the protection/development/management of forest/plantation areas which are treeless or on the verge of becoming protected.

- **Soil and Water Conservation (SWC):**
  Despite being comparatively good, the condition of forest soil is not good due to many forest areas of the district being vacant and without cover. The fertile layer of the soil is getting destroyed due to soil erosion. Rainwater conservation is also getting adversely affected due to lack of surface cover. Keeping in mind the hilly topography of the district, there is a need to take measures for land and water conservation on a large scale.

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3.2.2 Objectives of future forest management

On the basis of the above discussion, it is proposed to do future forest management to achieve the following immediate and long-term objectives:

Environmental and Ecological Objectives:

- To maintain ecological food chain and balance by conserving wildlife shelters and habitats and biodiversity.
- To conserve the abundant biodiversity located in the district and to develop it progressively.
- To connect the general public with it by doing extensive publicity for the conservation of forest and wildlife wealth present in the district and to get their active cooperation through eco-tourism.
- To conserve the genetic elements present in biodiversity for possible future needs.
- To prevent soil erosion and conserve rainwater by increasing trees and forest cover and through other measures of soil and water conservation.
- To increase the tree cover of the district by tree-covering new areas in the district through extensive publicity, propagation, awareness and mass movement.
- To conserve groundwater by protecting the forest area and trees covered on the banks of water streams, on steep hill slopes and in hilly areas.
- To restore bamboo in the forests and non-forest areas of the district through appropriate management and plantation.
- To increase the forest growth stock through the best and appropriate forest enhancement system and to achieve continuity in the age group distribution of major crop species. To promote and protect natural regeneration.
- To obtain high quality forests by improving the structure and condition of forest crops through the best and appropriate forest enhancement system.
- To improve and rehabilitate the degraded crop conditions in treeless and insufficient forest growth reserves areas through artificial plantation, soil and water conservation measures and supportive forest enhancement works.
- To create an environment for the successful establishment of regeneration of major crop species.
- To establish harmony in achieving all the objectives and to achieve a sustainable increase in annual production to meet the needs of the local and the state by doing forest enhancement treatment of the forest wealth.

Social Objectives:

- To fulfill the daily livelihood needs of the local people in the form of timber, firewood, fodder and grass etc. by improving and increasing the productivity of forests through scientific management of forests.
- To preserve flowers, fruits, minor forest produce, fodder etc. for [illegible] villagers, especially the people of tribal communities living around forests and depend on them for livelihood.

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- To involve tribes and local villagers in the maintenance, reproduction, development and conservation of forests and to provide profitable income enhancement and employment opportunities through scientific exploitation of forest produce.

Policy and administrative objectives (National Forest Policy 1988):

- To achieve the basic objectives of National Forest Policy 1988 and State Forest Policy 2021.
- To materialize the practical implementation of the provisions of various Acts affecting forests in accordance with scientific principles.
- To facilitate forest management in accordance with various decisions, orders and interpretations propounded by the Honorable Supreme Court.
- To strengthen and make forest boundaries effective.
- To improve the quality of major species by encouraging the use of latest technology and technical knowledge in forest management.
- To conduct scientific research, investigation and testing on various topics of forest enhancement such as biological and other pressures on forests, benefits obtained from forests, effects of forest management etc.
- To strengthen the criteria and indicators set for the review and monitoring of sustainable forest management in the forest management system of the district.
- To make the managerial and administrative system strong and effective for achieving appropriate objectives.

3.2.3 Composition of Management Circles

Due to the geographical diversity, rock structure, altitude, rainfall and other factors of Sikar district, the same type of management cannot be applied for the entire area of the district. Therefore, the forest area included in the work plan can be divided as follows:

1. The grass grazing agenda of the preliminary work plan report has also been included in the grass grazing agenda in the proposed work plan 2012-13 to 2021-22 which is part of the National Work Plan and it is in accordance with the code of conduct.

2. The wildlife management work circle described in the preliminary work planning report has been included in the proposed work plan from 2012-13 to 2021-22. Those areas have been included in the wildlife management circle which have been declared as wildlife protected areas or are proposed to be declared so. No technical remedies have been proposed in this work plan for these areas because these areas will be managed in accordance with the management work plan approved separately under the Wildlife Act. In the remaining forest areas and non-forest areas of the district, technical remedies have been proposed by keeping them in th[illegible] overlap management work circle.

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3. The shared forest (overlap) management circle is described the same in the preliminary work planning report and the proposed plan and no changes are proposed in this work plan because this work planning is in accordance with the code of conduct.

4. The Minor Forest Produce (Overlap) Management Circle mentioned in the initial work planning report has been named as Non-Timber Forest Produce (Overlap) Work Circle in the proposed plan because it is prescribed by the same name in the work planning code and hence it is in accordance with the nomenclature code. Apart from the change in the name only, the determination to focus on the management of medicinal plants only will also be added in the work determinations.

5. The elimination of Vilayati Babul has not been proposed in the proposed work plan 2012-13 to 2021-22 because there is a possibility of increasing soil erosion and adverse effect on the ecology. In the plantation management agenda for Vilayati Babul, the treatment of singling instead of felling has been proposed. In the preliminary work planning report, the decisions of the Medicinal Plant Development (Overlap) agenda have been included in the Minor Forest Produce (Overlap) Management Circle because it has been observed that medicinal plants are not distributed in quantitative and qualitative abundance in the forests of Sikar district, hence the management of medicinal plants has been included in the Non-Timber Forest Produce (Overlap) Circle. Hence, as there is no justification for keeping the Medicinal Plant Development (Overlap) and Australian Acacia Harvesting agenda, it has not been included in the proposed work plan.

6. The Ecological Tourism (Overlap) Management agenda mentioned in the preliminary work planning report has been removed from the management agenda and the chapter on Ecological Tourism has been added because the amount to be spent for tourism is not a part of this work plan, hence only the provision of funds for preparing the management plan for ecological tourism has been kept in this work plan. In this chapter, tourist and religious places located in the forest areas of the district have been included.

To fulfil the general objectives of forest management, the following three main management work cycles and four essential (essential) management work cycles have been formed and two management chapters have been written as follows –

3.2.4 Main Management Working Circle

1. Grass and Pasture Management Circle

Overlap Management WorkingCircle

1. Forest Protection Management Working Circle
2. Non Timber Forest Produce Working Circle

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3. Join Forest Management Working Cirlce

4. Wild life management Working Circle

5. Ecotourism Management Working Circle

3.2.5 Management under different Working Circles

Grass & Pasture Management Working Circle

All those forest block areas which are mostly known as grass beeds in Sikar and Laxmangarh apart from some beeds in Sikar and Shrimadhopur range and were included in the grass and pasture minutes in the previous work plan Jaipur Verma Plan (from 1966-67 to 1976-77), apart from that later such grass beeds and Johar, Kandra areas which were not included in that work plan but were declared later have been included. In these forest blocks apart from the previously planted area, grass management treatments will be proposed in the remaining vacant area. In this circle, by making dense and effective fencing of forest areas, the pastures will be managed for grazing by encouraging grass and fodder species, because due to entry of more cattle than the grazing capacity, the remedies of this work circle will never be successful. Therefore, remedies will be prescribed to manage the forest protection work circle by increasing the grass species with the participation of local people along with effective fencing and by grazing the grass by the local residents.

Wildlife Management Woking Circle

This management area includes those forest areas which have been declared or proposed to be protected areas under the Wildlife Act from the point of view of wildlife conservation, habitat and ecological conservation. Shakambhari Mata Conservation in these forest areas. Apart from the Raghunathgarh forest block, Jeenmata, Revasa and Sikar Beed forest blocks are included. No treatment has been proposed under this work plan in all the protected forest areas because a separate management plan for these protected areas will be prepared and approved under the Wildlife Act and these areas will be managed accordingly. Apart from this, seven such reserved forest areas of Chak grass have also been included which are available in the form of plateau on the top of the hills of Raghunathgarh forest block and are declared reserved forest areas in the name of Chak grass and no technical treatment of this work plan can be proposed in these Chak grasses also because a separate management plan has been approved for the protected area in which these Chak grasses are located. In this work plan, these areas have been shown from the point of view of introduction of the total area of the forest division. In this work plan, by doing field work, portfolio description and fund maps of these areas have been prepared which will be useful in the management plan to be prepared separately.

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Non-timber Forest Produce (overlapping) Management Working Circle

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This Overlap Management Circle has been formed with the objective of regulating the non-timber minor forest produce (minor forest produce) such as honey, wax, grass, water-plum, fruits and flowers etc. Treatments will be proposed by the State Government under the Shared Forest Management Rules under the Panchayat Raj Act. Development of medicinal plants is possible in some forest areas. In this programme, apart from the local use and development of naturally available minor forest produce, treatments will be prescribed for the development (to increase) of potential and suitable areas in the forest areas of Karanja, Guggal and Ashwagandha etc. in the available and suitable land areas under Shared Forest Management. The area of the management worksheet will be the entire district.

Joint Forest Management-(Overlapping) Working Circle

This legally desirable (Undercover) Management Worksheet also overlaps the entire district. It describes the method of establishing and strengthening shared forest management in all the works proposed in the forest areas or non-forest areas of the district.

Wildlife Management- Overlapping Working Circle:

In this legally desirable management have been proposed for the conservation and development of wild animals found in the remaining forest areas and revenue areas.

Ecotourism Management Working Circle:

In this management, such places which have the potential for ecotourism have been identified and proposals have been made to develop them for ecotourism, which are located in the forest areas. In this, forest is protected in Sikar Beed protected areas, and develop them as tourist places and to create awareness among the general public for forest conservation.

3.2.5.6 Period of Work Plan:

The period of this work plan has been fixed for 10 years which was effective from the year 2012-13 to the year 2021-22.

3.2.7 Forest Fire Protection System:

The present system of fire protection is not satisfactory. In this district, fire lines are only for name sake because due to continuous neglect, their condition is very dilapidated. There is always a danger of fire in the forests of this district and every year fires also occur in them. Hence the following steps will have to be taken for safety.

3.2.7.1Fire Line Development

Fire line development in a conservation reserve refers to the creation of controlled boundaries or barriers to manage and prevent the spread of wildfires within protected or sensitive areas. These fire lines are typically constructed by clearing vegetation or digging [illegible] to halt or redirect the fire's progression, ensuring that critical habitats and ecosystems are protected from destruction.

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Here are the key steps and considerations involved in fire line development in a conservation reserve:

1. Assessment and Planning:

- Fire Risk Analysis: Determine areas most at risk from wildfires and identify vulnerable habitats or species.

•Location: Plan the fire line in areas that do not disrupt important ecological features or wildlife corridors.

- Access Points: Ensure the fire line is accessible for firefighting personnel and equipment.

2. Fire Line Construction:

- Clearing Vegetation: Remove vegetation, such as shrubs, grasses, and trees, that could fuel a fire. This can be done manually or using machinery.

- Trenching or Plowing: In some cases, creating a physical barrier, such as a trench or plowed soil, may be necessary.

- Water Sources: Access to water is critical for fire management, so positioning fire lines near water bodies or establishing water points along the line is important.

3. Monitoring and Maintenance:

- Regular Inspections: Fire lines must be regularly inspected and maintained to ensure their effectiveness, especially after rainfall or plant regrowth.

- Vegetation Control: Invasive or fast-growing plants may need to be managed to ensure the fire line remains clear.

4. Ecological Considerations:

- Minimizing Ecological Impact: It's essential to balance fire line construction with the goal of preserving natural ecosystems, ensuring that fire lines do not disrupt biodiversity or wildlife habitats.

- Buffer Zones: Create buffer zones around fire lines to prevent accidental ignition outside the reserve and to protect neighboring land.

5. Coordination with Local Authorities:

- Collaboration: Fire line development often requires coordination with local fire management authorities, environmental agencies, and community stakeholders to ensure that fire management plans align with broader regional fire safety goals.

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Fire lines are a critical tool for wildfire management, but their design and implementation must be carefully considered to maintain the integrity of conservation areas while also mitigating fire risks.

To keep the forest areas safe from fire, it is necessary that information about fire incidents is received on time and the spot is reached immediately. It is also necessary to be trained for fire extinguishing. For this, the following steps will be taken:

1. The members of the Forest Protection and Management Committee should be given necessary knowledge and training regarding the sources of fire incidents, their characteristics, permanent and temporary damage caused by them and their prevention.
2. Especially in the summer months, the members of the committee should be made bound to monitor the fire incidents.
3. In case of a fire incident, the name, designation and contact number of the contact officer etc. should be prominently displayed in the forest areas, populated areas and on the roads passing through the forest area.
4. Those who report incidents of fire in forest areas and those who help in preventing fire should be encouraged by giving those suitable rewards or prizes.
5. Every incident of fire in forest areas should be taken seriously. Even the smallest incident should be recorded. The regional forest officer should himself investigate it and learn a lesson from it. Recurrence of fire incidents in the area should be curbed.
6. Register of fire incidents, register of fire lines and map of fire incidents should be maintained at check post, range and forest division level.
7. Maintenance and cleaning of fire lines should be done every year.
8. Fire guards should also be deployed in summer season.
9. There should be provision of funds in the annual budget for compliance of the above.
10. Fire watch towers should be constructed at various places.
This reserve is protected by the concerned RFO and field Staff.

3.2.7.2 Inter- agency Programmes and Problems:

MJSA, Campa, CSS, State plan, MNAREGA Schemes for plantation & conservation and developments are the programmes of government that are undertaken. Inside the conservation area such works are seldom undertaken like eco restoration, boundary wall and city afforestation etc. The major problem is to get funds from these agencies.

3.3 Forest Resource dependency of local communities/Major Land use in larger landscape

The dependency of local people on forest products is recognised as an essential driver of sustainable forest conservation and restoration, but empirical studies evaluating it are scant. Some households were interviewed in surroundings village, along w[illegible] informed interviews and focus group discussions with the villagers in the [illegible] Results suggest that education level, livestock size, and distance to the forest as the [illegible] factors that are negatively and significantly associated with forest dependency; whereas, only

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landholding size was negatively and significantly associated with forest dependency in some areas. On the other hand, the other two variables, family size and age, were insignificant. The income derived from forest has been accounted second-largest share after agricultural income to the total annual household income. Fuelwood was the major forest product and was largely extracted by the local communities. The active participation of locals in biodiversity conservation and forest management is required.

The rural communities of Rajasthan are less dependent on the forests in comparison to other Indian states. However, their dependence is still substantial, especially for fuel wood, timber and fodder, the forests also provide the rural communities with fruits, gum, and bark, which they can sell to supplement their income.

In this area, Pani Poola, Gum, Dhak, Honey-wax, Luganpatari, Grass, Fruits-Flowers etc. are found.

Pani Poola:

Munja is found in forest areas, caves, and development works being done on community land, pastures, grazing lands and on the boundary of agricultural land. It is also known as Pani Poola. The department earns income. Munja has made its place as a very useful product in rural lifestyle.

The suitable place for Munja is open deep soil areas without vegetation.

In forest areas, Munja is available in good quantity only for the first 3-4 years of plantation, after which the production of Munja also gradually decreases when the plants grow. Munja is auctioned every year in July-August at the forest division/range level and is harvested every year in October-November. Regular harvesting leads to good growth of Munja. If Munja is not cut, its production and quality gradually decreases.

Uses Of Munja:

- Munja is mainly used for huts for local residents, cattle sheds, huts for fodder, rope making, Mudda industry, Vinegar industry etc.
- Munja has an important place in the construction of huts in tourist areas and cheap temporary housing for villagers through Vinegar in urban areas.
- Fifty-fifty percent of the net income from the auction of Munja should be given to the Forest Department and the Gramya Van Suraksha and Management Committee so that public participation can be increased by taking the cooperation of villagers to ban illegal extraction.

Loom Patadi:

Lum Patadi of Khejri tree holds an important place among non-wood forest products.

Khejri has two fruits in a year and its fodder is nutritious and is a life saver for farmers in dieing circumstances like famine. The raw pods of Khejri are known as "Sangri". A delicious vegetable is made from dried Sangri. It is sold at a very high price in the local market. Apart from this, small and less thick branches of Khejri are used in Hawan and as fuel.

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Paan - Cheela:

It was found in abundance in the hilly region and its foothills, but due to increasing population pressure, illegal mining and illegal felling, the number of Dhaak trees has decreased considerably. Nevertheless, Dhaak is still found in the above mentioned forest blocks. At these places, auction of Dhaak leaves as "Paan-Chhila" was done every year till the year 2005-06, but now it could not be done due to minimum quantity of trees of the said species in the area.

Paan-Chhila is mainly used for the leaf plate industry. In rural areas, families of the barber caste used to collect Dhaak leaves to fulfill the local demand.

Participation and protection in management should be encouraged as before through the medium of rural forest protection and management committees.

Honey and Wax

Honey and wax are found in forest areas. Honey is used in medicine making, cosmetics, beverages and as a material for worship of God. Wax is a multi-purpose forest product. The district receives an income of about Rs 35-40 thousand per year from honey and wax contracts. Participation and protection in management should be encouraged as before through village forest protection and management committees.

Gum, Tannin and Lac (Minor Forest Produce)

It would be better to use the bark of the indigenous Babul found in the area for dyeing. Efforts to produce "lac" on ber bushes can prove useful. Amla, Bil and Ber fruits should also be collected under public participation as above. In the past years, so much gum and oleo-resin has been extracted from Kadaaya and Salar that the trees have dried up. The state government has imposed a complete ban on the extraction and collection of Salar and all other types of gum for an indefinite period. The help of local protection committees should also be taken to stop the illegal collection of these minor forest produce. There should be a provision to distribute 10 percent of the incentive amount as a reward to informers or people who cooperate in preventing damage in forest areas so that forest workers and representatives of committees keep getting public support.

Minor forest produce with medicinal properties:

Considering the condition of forests, minor forest produce with medicinal properties can be promoted in the forest area. But authentic information about their current availability, area of their existence and extent etc. is not available. There is a need to collect information by conducting detailed survey and study for the management of plants and tree species having medicinal properties found naturally in the district. At present, a programme can be taken up to conserve and promote the following important medicinal species on visual basis:

Google is available in abundance in Dokan forest block of range, which n[illegible]ervation. Apart from this, Karanja, Safed Musli, Konch, Chirmi, Go[illegible], Amla, Brahmi, Adhatoda, Kadaaya, Bel, Ashwagandha, Shankhpushpi etc.

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3.4 Eco-Tourism and Interpretation

This area is very important from the tourism point of view. There are many tourist places. People from all over the country come to visit Shakambari., The city of Sikar was established by Kayamkhani Nawab Fateh Mohd in 1508 AD. He also constructed the Fort of Sikarin 1516. The city once served as the capital of Sikar. Today, Sikar is popularly known as the culture capital of Shekhawati. It is full of stunning sights to visit, of which, the Dwarkadheesh Mandir, Singhania Haveli, Nadine Le Prince Cultural Centre and Fatehchandka Haveli are the more notable ones.

Some important sites with refrence to Eco- tourism in Sikar and Beed:

1. **Nadine Cultural Centre**

A haveli was purchased in 1998 by French artist Nadine a descendant of prestigious French painter Jean-Baptiste Le Prince. The "Nand Lal Devra Haveli" (meaning "The Haveli of Nandlal Devra": Nandlal Devra is the name of the merchant who constructed the haveli) was originally built in 1802 by a rich family of traders, the Devras, who were officers at the court of the local Maharaja. Since then, Nadine Le Prince has entirely restored the palace and all the frescoes. She is doing much to preserve and restore the heritage of havelis throughout Shekhawati, working with other associations to give the havelis a second life.

Besides, she has opened a cultural center where her most precious paintings are exhibited along with many French and Indian modern artists' works to mingle old and contemporary art. The Kala Dirga Gallery of Contemporary Art features pieces made by artists about India; the Saraswati Gallery covers traditional themes of Rajasthan, through painting. In addition, there are two little Tribal Art Galleries exhibiting the artistic work of tribes, as Patachitras and Madhubani. The aim of the project is to offer the visitor a large panorama of works and visions of India; the exhibited artists and art are from France, from Jaipur Fine Art School and local Shekhawati painters.

Le Prince has established a program of artists in residence and plans to organize other cultural events, such as dance and music shows, to make this enchanting palace become a lively place for art in all forms.

2. **Dwarkadheesh Temple**

The Dwarkadheesh Temple popularly known as 'Asharam Temple' was built in the 19th century by the sons of Seth Asharam Ji Poddar in memory of their father. The murals of this temple are representative of the famous Shekhawati wall paintings also known as 'Open Air Art Gallery'.

3. **Saraf Haveli**

This haveli was built around 200 years ago. It is a destination for visiting SikarShekhawati. The walls are decorated with original mural oil paintings. The wooden doors are aesthetically crafted.

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4. Sitaram Kedia Ki Haveli

This haveli was constructed by Seth Shree Bohitram Kedia, grandfather of the late Sitaram Kedia. Rajendra Kumar Kedia is an eminent author and book lover. He and his son Anurag Kedia are the current owners.

The haveli has two chawnks or courtyards a garden with fountain at back and Naals on both sides; the wall paintings are traditional. It has a library and modern baths. It was first haveli in Sikarto have electricity (via generators) and called Bijliwali Haveli. In 1931 AD Sitaram Kedia was married to the daughter of Bajaj family of Bisau. On this occasion Rao Raja Maharaj Shri Kalyan Singh Ji Bahadur of Sikar Thikana came to bless the couple. Seth Shree Bohitram Kedia brought an aeroplane (popularly called 'Cheel Gadi' or eagle craft) to scatter invitations printed on handkerchiefs for all and flower petals on His Royal Highness. Pleased with the courtesy and respect His Royal Highness granted the family of Seth Shree Bohitram Kedia permission was given to wear gold ornaments below their waist (a privilege that only royals enjoyed in that era).

Although most rooms are locked one can visit the haveli free of any charge, courtesy the Kedia family: Sitaram Kedia Ki Haveli, opposite Poddar Girls School, near Roadways bus stand, SikarShekhawati, Rajasthan.

5. Goenka Haveli

The Mahaveer Prasad Goenka Haveli Sikarestablished in 1870 is one of the best havelis in Fatehpur. The frescos and murals at the haveli are reflective of the craftsmanship that flourished in the area.[citation needed] The Goenkas were and still are affluent businessmen. Their haveli is one of the best to be seen in the Shekhawati Region. The havelis in Rajasthan in general and the havelis in Shekhawati in particular are famous for their colorful frescos. These havelis were owned by rich traders, for whom the havelis for most part served as symbols of status. However, the families then also used to be huge and anything less than a mansion in terms of size, would have been hard put to accommodate a family.

Moreover, business was also usually collectively owned by the members of the family-brothers or kins. The sharing of the sources of income led to the sharing of the same roof and more.

Description:

The Mahaveer Prasad Goenka Haveli in Sikar has excellent paintings on the walls. Many of the paintings depict Lord Krishna's pastimes- his flirtations with the gopinis, his romance with Radha, are some of the most commonly seen. Lord Krishna happened to be an interesting and common subject for frescos all over Rajasthan, considering the popularity of the god in the region.

The main highlight of the Mahaveer Prasad Goenka Haveli in Sikar Rajasthan is the painted ceiling in an upstairs room. The Mahaveer Prasad Goenka Haveli SikarRajasthan can be reached by taking the main road north from the busstand, and then veering left at the main intersection. The house to the left of the Mahaveer Prasad G[illegible]ka [illegible]eli Sikar also has nice mirror work another common feature when it comes to discussing fresco art in Rajasthan.

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Again, like most havelis in Shekhawati, the Mahaveer Prasad Goenka Haveli Sikaropens with a massive carved wooden gate. The gate opens into an outer courtyard. This outer courtyard then leads to a smaller inner courtyard. The havelis in Rajasthan are built around an elaborate network of courtyards. The bigger the Haveli, the larger number of courtyards it would have and the more particular they would be to preserve the sanctity of the women of the family- prohibiting them from having a glance of the outer world.

6. Jainism in Fatehpur

The Kashthasangh sect of Jainism continued to be practiced in Sikaramong the Agarwals during the Kayam Khani rule, as attested by inscriptions of Samvat 1685, 1739, and then during the Shekhawat rule in sam. 1861.

7. Johads

Johads are traditional rainwater harvesting systems in the Shekhawati region of Rajasthan, India, and are found in many towns and villages in the area, including Fatehpur. Johads are also known as percolation ponds or pokhars.

Some Facts About Johads:

Purpose: Johads collect and store rainwater throughout the year for drinking, washing, bathing, and recharging groundwater in nearby wells.

Design: Johads are square or rectangular in shape, and often have artistic umbrellas at the entrances and corners.

Community ownership: Johads are community-owned and are considered a symbol of the region's architecture and culture.

Wildlife: Johads are home to resident and migratory birds, as well as other wildlife.

Ecotourism:

Is a form of sustainable tourism within a natural or cultural heritage area where community participation, protection and management of natural resources, culture, indigenous knowledge and practices, environmental education and ethics, as well as economic benefits are fostered and pursued for the enrichment of host community and satisfaction of visitors. According to the UNWTO, ecotourism refers to forms of tourism which have the following characteristics:

- All nature-based forms of tourism in which the main motivation of the tourists is the conservation and appreciation of nature as well as the traditional cultures prevailing in natural areas.
- It contains educational and interpretation features.
- It is generally, but not exclusively, organised by specialised tour operators for small groups. Service provider partners at the destinations tend to be small locally owned businesses.
- It minimises negative impacts upon the natural and sociocultural environment.
- It supports the maintenance of natural areas which are used as ecotourism attractions by:

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- Providing alternative employment and income opportunities for local communities;
- Generating economic benefits for host communities, organisations and authorities managing natural areas with conservation purposes;
- Increasing awareness towards the conservation of natural and cultural assets, both among locals and tourists.

There is ample scope for ecotourism here. To create a sense of love and awareness towards heritage and nature, dense forests near religious places, which are protected by the sentiments of local residents, which are the natural forests known as Gods' Forests, will be protected by increasing the participation of local villagers.

The objectives of Promoting Ecotourism:

(1) Natural forests are protected by local residents around religious places as Gods' Forests. Such forests should be developed for tourism, local villagers should be involved in it and economic support should be made and biodiversity conservation should be ensured by increasing their participation.

(2) Conservation of forts, palaces and other heritage sites situated in forest areas so that ecotourists can reach here for the purpose of education and entertainment.

(3) Training local residents as nature guides and making them partners in ecotourism so that an additional source of their income is created and their attachment to environment and natural resources can become deeper.

(4) Creating a sense of conservation of forests and wildlife among the common people. Organizing environmental camps for students to increase their love and understanding for nature.

(5) To help in improving the educational level of people by increasing their interest in nature. To create awareness among the general public about nature, environment and local culture.

(6) To remove the myths and fear about wild animals and to create a sense of their importance, conservation and tolerance towards them.

(7) To inspire people to experience the natural beauty and its direct/indirect benefits themselves.

Recommendations and Future Scope:

• For sustainable ecotourism, there is a crucial need to create an effective balancebetween three elements: environment, tourist and administration.

• Public and private ownership is required to enhance tourism-based services.

• Proper connectivity must be ensured to all the tourism-based locations.

• To maintain environmental harmony, it is essential to limit tourism activity in the ecofragile area. The administration must ensure it through proper channels.

• Rejuvenate the degraded forest by implementing various rules and regulations, andalso limit access in that particular part.

• Educate the community regarding today's environmental conditions so that they learn about a different aspect of life.

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• Unemployment among the new as well as the old generation is also a major concernthat must be removed by giving proper opportunity in tourism-based activity withoutharming nature.
• The administration must utilize human resources in different tourism activities bygiving effective and essential training.
• The government must promote Rajasthani folk cultures by including them in differenttraveling packages.
• Encourage different co-operative societies to make agro-horticultural and animalbased products and run different types of businesses like canteen/restaurants in thetourist spots through those.
• It is essential to make an eco-friendly environment for sustainable ecotourism development.
• Advertisement and publicity are a crucial part of attracting tourists to the location; thegovernment must take the initiative to give a proper allotment of funds from time totime in this regard.
• Utilize eco-friendly vehicles at a tourist location to make the environment free from pollution.
• Tourist circuit maps must highlight major tourist interest locations.
• In the sandy area, tourists may suffer a lack of connectivity and shortage of essentialgoods at major locations which must be neutralized by providing different rentalbased bus and car operations.
• In contemporary times, the internet has become a crucial medium for exchanginggeospatial data between users at various locations. It is imperative to enhance locationbased information activities to enable tourists to provide feedback on their experiencesat multiple scales. Such feedback can help to attract more tourists to the location andimprove the image of the site among future visitors, making it an effective strategy forsustainable tourism development.

3.5 Monitoring: Monitoring and Evaluation Practices used in the CR till date

3.5.1 Research And Monitoring:

There is lot of scope of research regarding flora and fauna in the conservation reserve area. Students will be allowed to research in the area as per approved management plan necessary permissions from CWLW office as per requirement. Any NGO or any other government organization will allowed research as per prevailing rules of protected area.Monitoring of this area will be done by CWLW rajasthan, CCF jaipur and DCF Sikar and Subordinates.

3.5.2 Training:

Regular trainings for staff and Eco Development Committee members are carried out every year in improvement of various skills. This will also improve interaction between management and people.

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3.5.2.1 On the Job Training

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There is a need for regular training of the officers to update their knowledge about the rules raining workshops are also helpful in sharing of information between people doing similar jobs in different working conditions. Regular trainings and capsule courses will help to keep their knowledge update regarding latest circulars, policies and their implementation in wildlife management.

Trainings should be organized for the staff every year hiring resource persons from such reputed NGOs. Knowledge of forest wild life area different count orders IPC, CrPC and Evidence Act is very essential for officers and staff to deal with the wildlife offence cases successfully. Help of Police, Law and Judicial departments will be taken for conducting purposeful trainings at regular intervals.

The staff and other persons to be engaged for wildlife census will also be given training in this regards. In addition field staff will also be trained in latest technology and procedures used in wildlife management. For the same experts will be called from reputed organization like WII, BNHS, SACON or WWF.

3.5.2.2 Formal Training courses

Various formal training courses will be conducted on following subjects:

- Wildlife protection training
- Flora and Fauna conservation training
- Development works training
- Fire protection training
- Forest and wildlife offences training
- Other training as per forest department manuals.

3.5.2.3 Establishing a learning centre

In the Range office, Sikara learning centre will be established and it will be the best training centre for flora and fauna conservation and management.

3.5.2.4 Themes Identified for Training

✓ Wildlife Monitoring Techniques.
✓ Wildlife Health Indicators for monitoring in the field
✓ Dealing with man animal conflict and animals in distress
✓ How to handle dead animals and how to collect evidences from the spot
✔ How to prepare herbarium
✓ Weapon training
✓ Handling of tranquilizing gun
✓ Wireless equipment handling and care.
✓ Legal aspects
✓ Detection and framing of offences.
✓Fire Drills - especially before the fire season for better fire fighting.
✓Identification of pugmarks, tracks, dung pellets

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✓ Identification of birds.
✓ Training in First Aid to man as well as animals.
✔ Training in use of audiovisual equipment.
✓ Computer Applications
✓ Vehicle repair in case of emergency

3.5.3 ECOSYSTEMS, WILDLIFE CONSERVATION STRATEGIES AND THEIR EVALUATION

Previously this area was managed through the prescriptions given under various Working Plans. However, due to biotic pressure the area has qualitatively suffered over the years. Grazing which was widespread has been stopped after notification of the reserve. Regular foot patrolling is being done to check this menace. Construction of masonry boundary walls and ditch fencing has helped in restoring the ecological integrity of the area. With inclusion of the area under protected area network, efforts towards biodiversity conservation becomes paramount.

The active management of the habitat has to be done in the area created for biodiversity conservation and for creating inviolate spaces for the panther. Grazing by domestic livestock has been stopped in the area since creation. The abundance of grasses will be increased by sowing of seed pallets during monsoon season as well as by planting grass slips prepared in the nursery. In future, this area will develop in plantations, SMC works, grasslands conservation and habitats of fauna. Fruit plants preferred by wild animal and other species like Rohida, Khejri, *Acacia nilotica*, *Ailanthus excelsa*, *Cenchrus ciliaris*, Zizyphus, *Acacia senegal*, Bad, Peepal, neem, shahtoot, Jamun, Citrous spp. and *Capparis decidua*, *Cenchrus setegris* are planted to enrich the habitat.

Drinking water is being provided to the animals and birds by old talab, water hole, kheli and by a dispenser system called Water guzzler. This system has been very effective in preventing water wastage while providing drinking water to birds and animals. Rain water and water from tube wells will be used for fauna.

Patrolling along the outer boundary of the areas has the protection strategy from the inception of the area. This will help in identifying the breaches in the fence and staff could quickly repair the same. The staff rounds up the cattle pushed inside and impose a fine before releasing them as per prevailing rules. During the rainy season, patrolling is intensified in the areas outside the area to check illegal cultivation.

Range Office's are situated in the Sikar & and subordinate staff will look after Protection activities and patrolling in the areas & outside the area tor prevention of poaching. Range forest officer and subordinate staff will also look into the strategies and comment on their efficacy and problems.

3.6 Administration and Organisational Structure

For administrative convenience, the total area of conservation is under Sikar and Srimadhopur Range forest office, the office is also situated with in conservation area for its

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better management. Deputy Conservator of Forests, Sikar also have regular visits and provide instruction to the sub ordinate staff for the better management of all works and progress. Five forester, ten assistant Forester/Forest guards and Twelve Cattle guards are essential for administration.

Chapter 4
Corridor Status and Functionality

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Three conservation reserves in a district are connected by wildlife corridors, it indicates a robust ecological network. These corridors can support biodiversity conservation by facilitating wildlife movement, maintaining genetic diversity, and enabling species to adapt to environmental changes. Here's a breakdown of the types of wildlife corridors:

1. Natural Corridors

- **Forest Corridors:** Uninterrupted stretches of forest that connect reserves, allowing species like tigers, elephants, or deer to migrate naturally.
- **Riverine Corridors:** Rivers and their surrounding vegetation that serve as movement paths, especially for aquatic and semi-aquatic species like otters or certain bird species.

2. Man-Made Corridors

- Eco-bridges, Wildlife Overpasses, Underpasses and Culverts are for species to cross beneath highways or railways, particularly effective for smaller mammals and reptiles are not required.

3. Linear Corridors

- **Grasslands and Shrublands:** Strips of vegetation that link different habitats, supporting movement for species that thrive in open or semi-open environments.
- **Hedgerows:** Tree and shrub barriers often planted along farmland or roads that double as connectors for birds, small mammals, and insects.

4. Stepping-Stone Corridors

- **Patches of Habitat:** Small forest patches, wetlands, or other habitats spaced closely enough for species to move between them, acting as temporary refuges.

5. Functional Corridors

- **Mixed-use Landscapes:** Areas like agroforests or community lands that serve as transitional zones between reserves, allowing species to pass through human-dominated areas.

Benefits of Connecting Conservation Reserves:

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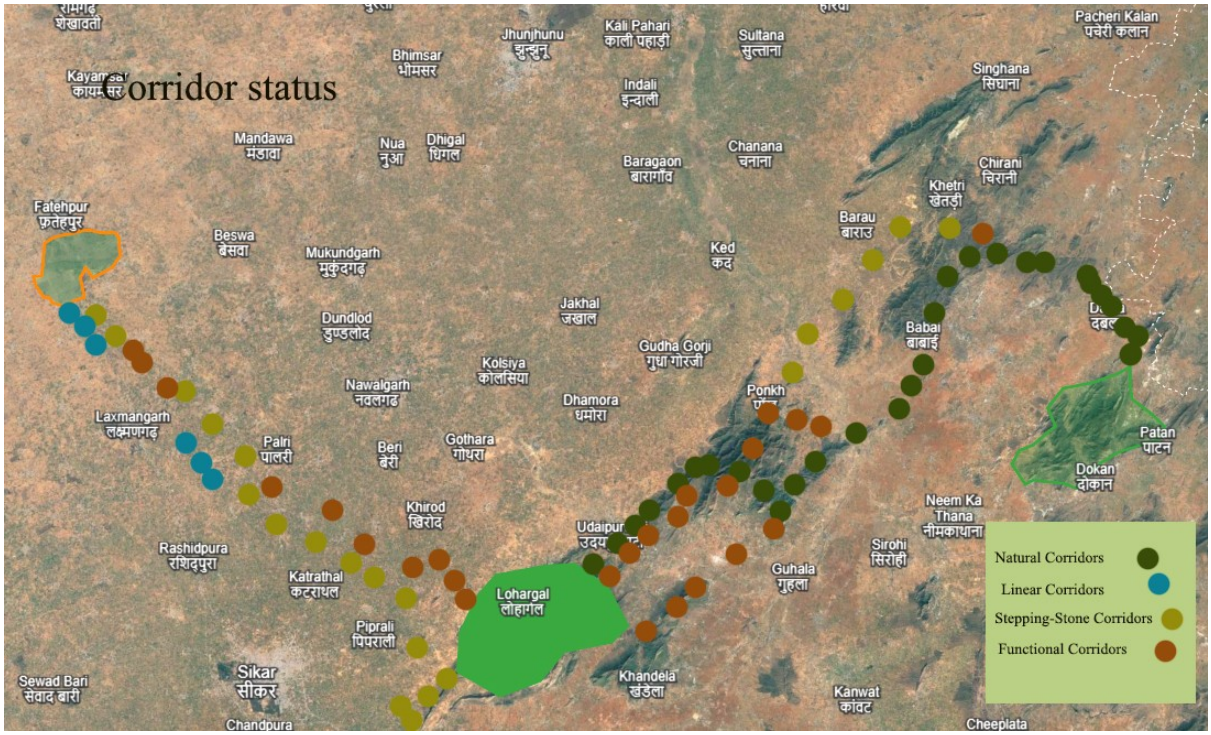
- **Biodiversity Protection:** Prevents isolation of wildlife populations and reduces inbreeding.
- **Climate Adaptation:** Enables species to shift their range in response to changing climates.
- **Human-Wildlife Conflict Mitigation:** Redirects animal movement away from human settlements.
- **Ecosystem Services:** Supports pollination, seed dispersal, and pest control across regions.



4.1.1 Fragmentation Analysis:

Habitat Fragmentation:

May contain: nature, landscape, outdoors, scenery, aerial view, urban, neighborhood, and building.

Habitat loss and fragmentation lead to a breakdown in ecological processes such as wildlife migration, seed dispersal, pollination of plants, and other natural functions that are essential for ecosystem health. The result is a decline in biodiversity (biological diversity) and local extinction of sensitive species.

Small fragmented habitat patches are correlated with lower species biodiversity, which means lower species richness and lower abundance/number of individuals. Habitat fragmentation is caused by natural factors and human activities. Natural fragmentation such as fires, extreme weather, and glaciers change a landscape slowly. Over time forests have evolved with fires and extreme weather events, and if left to nature, restora[illegible]ese lands after natural fragmentation occurs quickly. However, human-induced fragmentation generally changes landscapes at faster rates, over larger areas, and human changes are [illegible] to

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reverse. Some examples of human activities include agriculture, mining, housing development, industrial processing plants, and road construction.

Human activities not only exacerbate habitat fragmentation, but also change the climate. Climate Changes transforming our earth, forming novel ecosystems and communities that have never been observed before. This changing landscape is causing plants and animals to move in search of more favorableclimates, but fragmented habitats restrict an animal's ability to migrate and adapt to changing ecosystems.

Connecting habitats through corridors such as road overpasses and underpasses is onesolution to restore fragmented patches, building more climate resilient landscapes, and restoringpopulations and overall biodiversity.

Habitat fragmentation can occur in several ways, including:

- Decreased total area: The overall size of the habitat is reduced.
- Decreased interior: Edge Effect: The ratio of the interior to the edge of the habitat is decreased.
- Isolation: One habitat fragment is isolated from other areas of habitat.
- Breaking up: A single habitat patch is broken up into multiple smaller patches.
- Decreased average patch size: The average size of each habitat patch is reduced.
- Fragmentation of movement routes: Potential routes for movement between habitat patches are fragmented, such as by a road cutting through a woodland.

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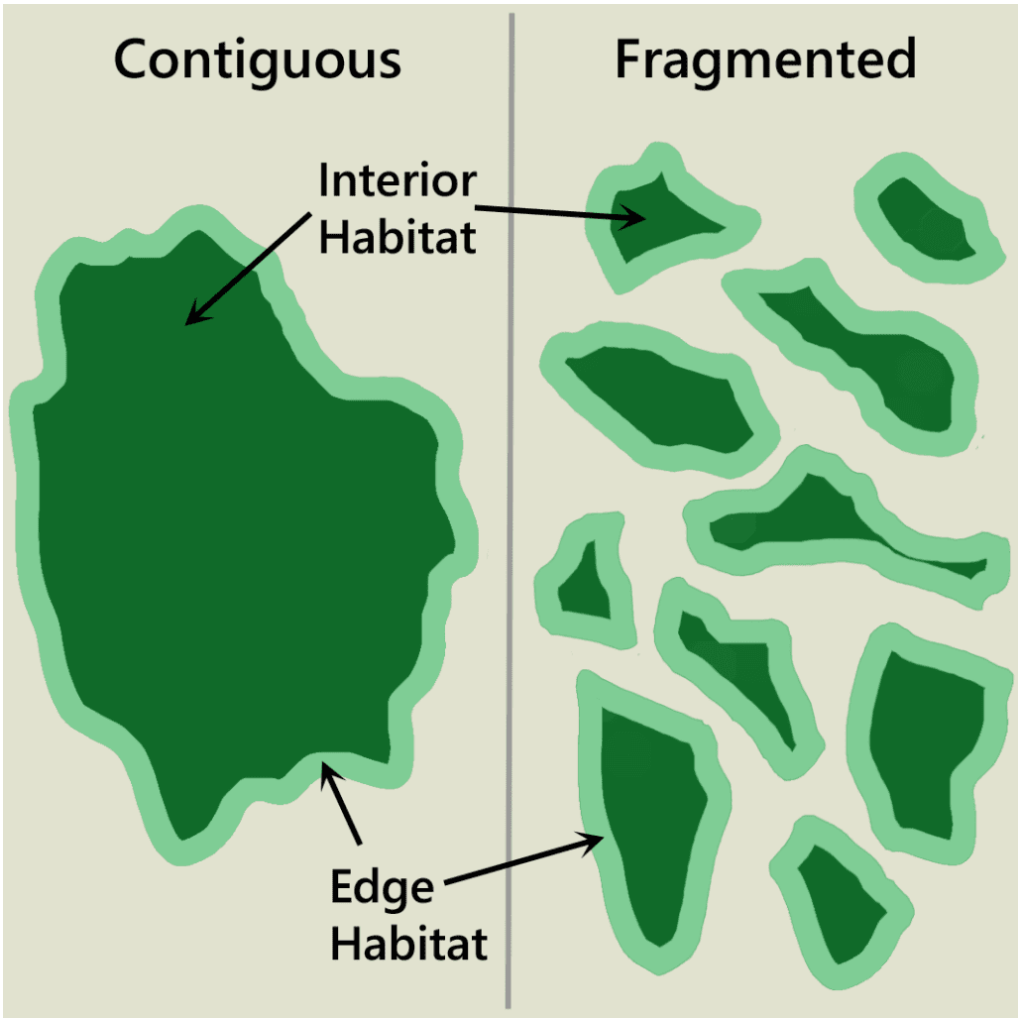

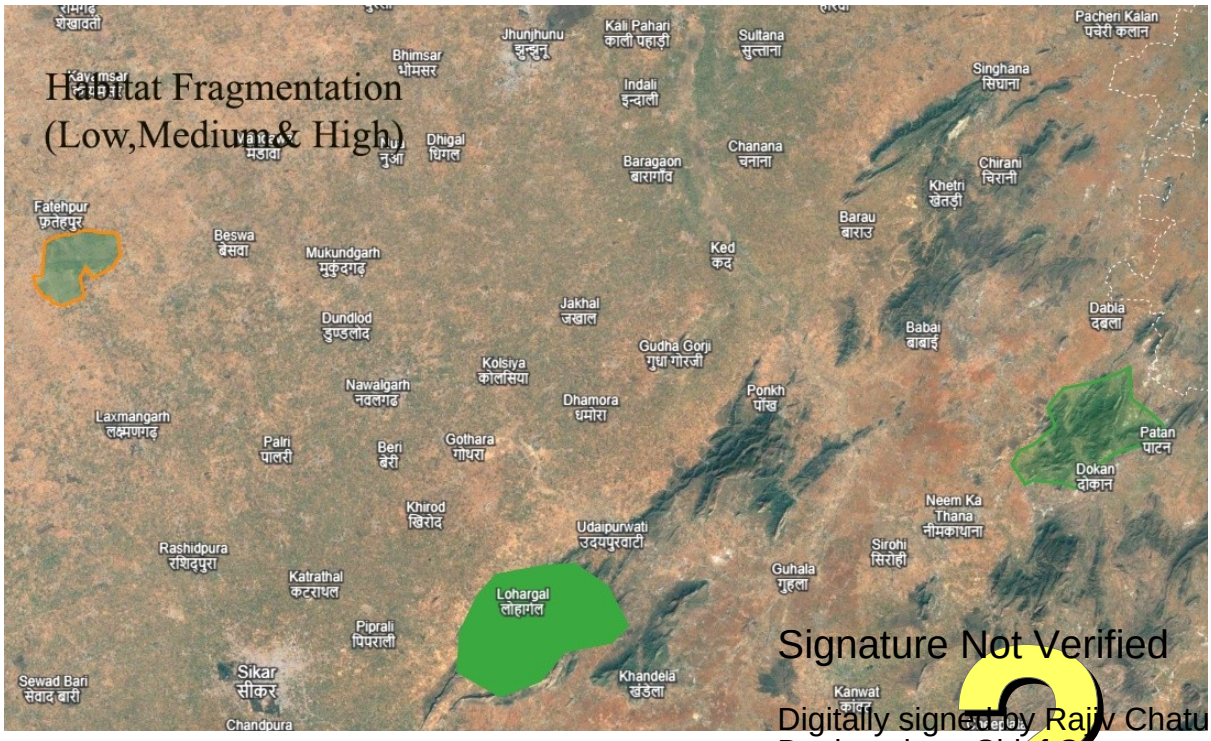

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4.1.2. Functional Status

The "functional status of wildlife corridors" refers to how effectively these corridors support the movement, health, and survival of wildlife populations. Wildlife corridors are natural or constructed pathways that connect separate habitats, allowing animals to move between them safely for food, mating, and migration. The functional status of these corridors considers several factors:

Connectivity: How well the corridor links different habitat areas, allowing for safe passage and genetic flow between animal populations.

Habitat Quality: The richness of resources within the corridor (e.g., food, water, shelter) that can sustain wildlife.

Barrier Reduction: The corridor's effectiveness in minimizing human-made obstacles like roads, fences, or developments that could hinder animal movement.

Biodiversity Support: The extent to which the corridor supports diverse species, including endangered or at-risk species.

Assessing the functional status of wildlife corridors helps conservationists understand how well these pathways fulfill their purpose and what improvements may be needed to ensure the survival and well-being of wildlife populations.

Analysis of Functional Status of Wildlife Corridors:

1. Connectivity and Landscape Integration

Assessment: To determine whether the corridor links fragmented habitats effectively. GIS (Geographic Information System) mapping and satellite imagery can identify landscape connectivity.

Metrics: To evaluate connectivity indices (e.g., structural or functional connectivity measures), which gauge the ease with which animals can move through the landscape.

Evaluation of Isolation: To measure distances between core habitats and examine potential isolation effects on wildlife species.

2. Habitat Quality within the Corridor

Assessment: To analyze the vegetation, water sources, shelter, and other resources that make the corridor a viable habitat for wildlife.

Metrics: Evaluate biodiversity indices (species richness, abundance, diversity), vegetation coverage, and the presence of critical resources.

Suitability: To determine if the habitat within the corridor meets the requirements for the targeted species to travel, rest, and find food.

3. Wildlife Movement and Usage Patterns

Assessment: Use of camera traps, GPS collars, and field observations to monitor which species use the corridor and how often.

Metrics: To track movement frequency, migration patterns, and corridor utilization by various species, focusing on keystone or endangered species.

Seasonal Variability: To Identify any seasonal changes in wildlife movement and the extent to which the corridor accommodates these patterns.

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4. Barrier and Risk Analysis

Assessment: Identify any obstacles within or near the corridor, such as roads, fences, or human activity that could impede wildlife movement.

Metrics: To measure crossing frequency over barriers (like roads) and analyze mortality rates due to vehicle collisions.

Human-Wildlife Conflict: To evaluate the level of human activity near the corridor that might lead to disturbances or conflicts, particularly near populated areas.

5. Biodiversity and Species Health Monitoring

Assessment: Track health indicators, population sizes, and genetic diversity of the wildlife populations using the corridor.

Metrics: To assess genetic diversity levels to see if the corridor is effective in preventing inbreeding among populations.

Survival and Reproduction: To monitor reproductive success, mortality rates, and signs of stress or disease.

6. Long-term Viability and Climate Resilience

Assessment: Analyze how climate change could impact the corridor's functionality, like shifts in vegetation zones or water availability.

Metrics: To evaluate the corridor's ability to adapt to changes in temperature, precipitation, and extreme weather events.

Future-Proofing: To identify potential risks to corridor sustainability and propose modifications to ensure long-term resilience.

7. Management and Conservation Efforts

Assessment: Review ongoing management practices, including protection against encroachment, habitat restoration, and anti-poaching efforts.

Metrics: To evaluate enforcement effectiveness, conservation investments, and community engagement initiatives to reduce human impact.

Stakeholder Collaboration: To assess cooperation between conservation organizations, government bodies, and local communities.

Conclusion

A comprehensive analysis of wildlife corridor functionality provides insights into their effectiveness and points to needed adjustments. By ensuring robust connectivity, quality habitats, safe movement, and active management, wildlife corridors can fulfill their role in preserving biodiversity and supporting ecosystem health. For that public awaerness and other activities will be implited time to time.

4.1.3 Anthropogenic status

The "anthropogenic status" of a wildlife corridor focuses on its value, benefits, and impacts from a human-centered perspective. This type of analysis considers how wildlife corridors affect, benefit, or intersect with human needs, values, and activities. Here's a breakdown of key elements in assessing the anthropocentric status of wildlife corridors:

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1. **Human Benefits and Ecosystem Services**

Biodiversity and Ecosystem Health: Corridors support biodiversity, which indirectly benefits humans by sustaining ecosystem services like pollination, water purification, and climate regulation.

Carbon Sequestration: Corridors often contain vegetation that sequesters carbon, helping to offset human-caused greenhouse gas emissions and mitigate climate change.

Recreational Opportunities: Wildlife corridors can be used for eco-tourism, hiking, birdwatching, and photography, providing cultural and recreational value to nearby communities.

2. Human Safety and Conflict Mitigation

Reduction in Human-Wildlife Conflicts: Well-planned corridors can reduce conflicts by providing designated paths for wildlife, minimizing encounters with humans, livestock, or agricultural areas.

Vehicle Collision Prevention: Corridors often include wildlife crossings or underpasses that reduce the risk of animal-vehicle collisions, improving safety for both wildlife and motorists.

Disease Management: Corridors help sustain healthy populations of animals, potentially preventing the spread of diseases that might otherwise emerge in stressed, overcrowded populations and affect humans (e.g., zoonotic diseases).

3. Economic Impacts

Increased Property Values: Areas near well-maintained natural corridors can see higher property values due to the appeal of green spaces and natural landscapes.

Job Creation and Economic Activity: Wildlife corridors can boost local economies through eco-tourism, conservation jobs, and infrastructure development (like wildlife crossings).

Agricultural and Livestock Impacts: Effective corridor placement can reduce crop and livestock losses due to animal encroachment, benefiting the agricultural economy.

4. Land Use and Development Considerations

Urban Planning and Land Management: Wildlife corridors must be considered within broader urban and land-use plans, requiring coordination to balance human development needs with conservation.

Infrastructure Development and Costs: Establishing and maintaining corridors can come with costs, particularly for creating safe crossing points, fences, and surveillance systems to prevent poaching. Balancing these investments with other societal priorities can be a challenge.

Resource Allocation: Land designated for corridors often cannot be used for farming, housing, or other human purposes, which may cause tension in regions with high human population densities or resource demands.

5. Community and Cultural Value

Cultural Significance: Many communities see intrinsic value in wildlife and natural spaces, so corridors align with cultural values around conservation and a commitment to environmental stewardship.

Community Engagement and Education: Corridors provide opportunities for educating the public on the importance of biodiversity and environmental conservation, fostering community involvement and support.

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Indigenous Land Rights and Stewardship: In regions where Indigenous communities have a strong connection to the land, wildlife corridors can align with traditional ecological knowledge and practices, enhancing both cultural preservation and conservation outcomes.

6. Policy and Regulatory Implications

Policy Development: Implementing wildlife corridors often requires policies around land use, funding, and conservation priorities, which can reflect the government's commitment to environmental sustainability.

Legal Protections: Protecting wildlife corridors may involve legal frameworks to prevent encroachment, poaching, or habitat degradation, which also impacts land-use laws and property rights.

Public Perception and Support: Public support is often necessary to secure funding and policy backing for wildlife corridors, requiring a clear demonstration of the corridor's benefits to society at large.

Conclusion

Assessing the anthropogenic status of wildlife corridors helps balance human interests with conservation goals. By recognizing the economic, safety and cultural values corridors provide, conservationists and policymakers can advocate for these pathways in ways that align with human priorities, ensuring their maintenance and enhancement in a human-dominated world.

Identification of Bird-Rich Sites and Their Habitats

Based on census data, the habitats of various bird species across different seasons can be readily identified. This will enable focused conservation efforts. As noted, this work should be carried out scientifically, under expert guidance and will be prioritized.

Proposed Measures for Bird Conservation

Most bird habitats in the district lie outside forest areas, near populated areas and villages. Therefore, effective conservation and development efforts require community involvement, particularly by collaborating with local Gram Panchayats and other governmental institutions and departments. To support and protect the rich birdlife, especially migratory species, the following steps will be undertaken:

1. Trees of species like Banyan, Peepal, Babul, Neem, Guler, Fig, and similar varieties will be encouraged along the banks of ponds and dams. These trees are essential for birds, providing food, shelter, and nesting sites.

2. These trees will also be planted on small islands in larger ponds to enhance options.

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3. Marshy and reed-filled areas will be developed along pond banks and islands, as many migratory and resident birds prefer such habitats. Appropriate aquatic plants, wetland crops, and vegetation will be introduced to create suitable swampy or reed-rich environments.

4. Weed management will be undertaken, especially targeting invasive species like Australian acacia and carrot grass, which negatively impact the quality and appearance of water bodies. Aquatic weeds will be carefully controlled, and terrestrial weeds will be removed completely before they release seeds.

5. Fishing activities will be regulated to ensure that birds have access to their preferred food sources, maintaining the ecological balance of the water bodies.

6. Bird-watching scaffolds, platforms, or towers will be constructed at key water bodies, making bird observation accessible and supporting eco-tourism. These structures will be installed near major ponds along main roads, city outskirts, and significant ponds within or near forested areas, with extensive promotion to attract visitors.

7. Informational boards with detailed descriptions of local bird species will be placed at bird-rich water bodies to educate visitors.

Additional Conservation Regulations

The following additional measures will be considered to support wildlife conservation :
1. Bird-watching programs will be organized on water bodies during winter to attract bird enthusiasts and raise awareness.
2. A "Bird Association" should be established under the guidance of the Deputy Forest Conservator to involve local bird lovers and encourage community-led bird conservation efforts.
3. Public awareness and goodwill toward wildlife conservation should be cultivated through regular participation in events such as Wildlife Week and bird-watching programs, as well as through the Joint Forest Management process.
4. Information regarding compensation for wildlife-related loss of life or property and other wildlife safety and conservation regulations will be widely communicated to the public.

This holistic approach aims to foster sustainable bird conservation through community engagement, habitat preservation, and awareness-building initiatives.

4.2 Areas with Potential for Movement, Stay and Reproduction

Areas with high potential for wildlife movement, stay and reproduction are often rich in natural resources, low in human disturbance and provide a diverse range of habitats. These areas act as crucial sites for wildlife to migrate, find temporary or permanent refuge, and reproduce.

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Protected Forest Reserves provide food, shelter and breeding grounds, making them ideal for wildlife species that require extensive territories. They often have limited human interference, allowing for natural behavior patterns.

Wetlands support diverse plant and animal species, serving as breeding grounds and providing critical resources like fish, insects, and aquatic plants. Grasslands support herbivores that feed on grasses and predators that rely on these herbivores as prey. These areas offer space for movement and are often rich in biodiversity.

These areas provide critical resources and refuge, supporting wildlife populations, especially for species that need ample space and varied resources for successful movement, temporary stays, and reproduction.

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Chapter 5
Managerial strategy (corridor management) with Thematic Actions

A managerial strategy for corridor management involves creating a structured plan to conserve and maintain wildlife corridors while balancing ecological needs with human interests. This strategy generally includes thematic actions focusing on habitat preservation, community engagement, policy, and monitoring to ensure that corridors remain functional for wildlife movement, migration, and reproduction. Below is an outline of such a strategy with specific thematic actions:

1. Habitat Conservation and Restoration

Goal: To preserve and restore critical habitats within wildlife corridors to support species movement, food sources, and breeding areas.

Habitat Preservation: To identify and protect key habitat zones within the corridor, focusing on high-biodiversity areas or those with sensitive ecosystems.

Vegetation Restoration: Planting native trees, shrubs, and grasses to enhance habitat connectivity and provide food and shelter for wildlife.

Water Source Management: Preservation and rehabilitation of natural water bodies (ponds, streams) to maintain water availability and attract diverse species.

Invasive Species Control: To regularly remove invasive plant species that could disrupt native flora and fauna, such as Australian acacia or carrot grass, which impact water quality and habitat structure.

Rotational grazing

Rotational grazing is a system where livestock are moved between pastures (or paddocks) to allow vegetation in previously grazed areas time to recover. It mimics natural grazing patterns and can improve pasture health, water retention, and biodiversity.

Benefits of Rotational Grazing :

1. Improves Plant Diversity: Well-managed grazing can control invasive species and promote native plant growth.

2. Wildlife Habitat: Creates a more diverse structure in vegetation, which benefits various wildlife species.

3. Soil Health: Reduces compaction and increases organic matter through managed manure distribution.

4. Drought Resilience: Deep-rooted plants are encouraged, improving water infiltration and storage.

Restrictions and Guidelines:

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- Requires NRCS (Natural Resources Conservation Service) or FSA (Farm Service Agency) approval.
- Usually limited to specific times (e.g., outside nesting seasons).
- Stocking rates and rotation schedules must prevent overgrazing.

Translocation of animals

Translocation of animals in conservation reserves refers to the process of moving animals from one location to another as part of a conservation strategy. This technique is widely used to preserve species, maintain biodiversity, and restore or strengthen populations within conservation areas. The primary purpose of animal translocation is to ensure the long-term survival of species that are at risk of extinction, face threats in their current habitats, or need help recovering their numbers.

There are different contexts and types of translocation within conservation reserves:

1. Types of Translocation in Conservation Reserves

- Reintroduction: The return of a species to a location where it has been previously extirpated (locally extinct). This can help restore biodiversity to an area and re-establish a species' role in the ecosystem.
- Reinforcement (or Augmentation): The introduction of additional individuals into an existing population to help increase numbers, improve genetic diversity, or strengthen the resilience of the population.
- Ex Situ Translocation: The temporary or permanent relocation of species to a controlled environment (like a zoo or breeding facility) for protection, breeding, or health management before reintroduction.

2. Objectives of Animal Translocation

- Biodiversity Conservation: By moving species to conservation reserves or suitable habitats, translocation helps maintain ecological balance and supports overall biodiversity.
- Genetic Diversity: Translocation can increase the genetic pool by introducing individuals from different populations, which helps prevent inbreeding and genetic bottlenecks.
- Restoring Ecosystem Functions: Certain species play key roles in ecosystems, such as predators controlling prey populations or herbivores shaping plant communities. Translocating such species can help restore the health and balance of ecosystems.

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- Population Recovery: Moving animals to new or protected areas can support the recovery of species that have declined due to threats like habitat loss, poaching, or disease.

3. Challenges and Risks of Animal Translocation

- Habitat Suitability: The new location must provide the necessary resources (food, shelter, space) and environmental conditions for the species' survival. If the habitat is unsuitable, the translocated animals may struggle or fail to thrive.

- Disease Transmission: Animals moving between different areas could introduce new diseases, which might affect both the translocated species and local wildlife.

- Behavioral Adaptation: Animals may not adapt well to new environments, especially if the ecosystems are different from their native habitats.

- Competition with Local Species: Translocated animals may outcompete native species for resources, leading to unintended ecological consequences.

- Costs and Logistics: Translocation efforts can be expensive and require extensive planning, monitoring, and long-term support to ensure success.

2. Connectivity Enhancement

Goal: Ensuring that the corridor remains continuous and connected to enable unrestricted wildlife movement.

Wildlife Crossings and Underpasses: Installing overpasses, underpasses, and bridges to allow safe crossing points across roads or highways, reducing vehicle collisions and human-wildlife conflict.

Fencing and Boundaries: Use of strategic fencing in sensitive areas to prevent animals from straying into human settlements, farms, or roads while allowing for natural corridor flow.

Green Buffer Zones: Establishment of buffer zones around the corridor to limit development and reduce noise, pollution, and human disturbances.

3. Community Engagement and Education

Goal: Involvement of local communities and stakeholders in corridor conservation efforts to build support and cooperation.

Community Awareness Programs: Conducting workshops and educational programs on the importance of wildlife corridors and the benefits they bring to local ecosystems.

Collaborative Conservation: Partnership with local Gram Panchayats, village councils, and other local government bodies to ensure community alignment and involvement in conservation.

Livelihood Support: Creating alternative livelihoods (e.g., [illegible] or handicrafts) for communities to reduce pressure on natural resources within the corridor.

4. Regulatory and Policy Development

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Goal: Developing and enforcing policies that protect the integrity of wildlife corridors and ensure sustainable use.
Land Use Policies: Implementation of zoning and land use restrictions to prevent encroachment, deforestation, or agricultural expansion within the corridor.
Legal Protection: Securing official protected status for critical parts of the corridor to shield them from development or industrial activities.
Compensation Mechanisms: Establishing and publicizing mechanisms for compensating locals for any loss of property or crop damage caused by wildlife to reduce resistance to conservation efforts.

5. Research and Monitoring

Goal: To continuously assess corridor health, wildlife use, and the effectiveness of conservation measures.
Wildlife Population Monitoring: Regularly conducting species censuses and track population health to identify trends or emerging issues within corridor areas.
Habitat Quality Assessments: Using remote sensing, field surveys, and ecological indicators to monitor the condition of habitats and assess the impact of conservation actions.
Technology in Monitoring: Use of GPS tracking, camera traps, and drones to monitor wildlife movement patterns and detect human disturbances, poaching, or illegal activities.

6. Sustainable Resource Management

Goal: Managing natural resources within the corridor in a way that supports both wildlife needs and sustainable human use.
Water Resource Management: Implementing practices for sustainable water extraction, particularly in regions prone to water scarcity, to maintain water levels in wetlands, ponds, and rivers.
Controlled Grazing: Developing rotational grazing practices in corridor areas to balance livestock needs with habitat conservation.

Balanced herbivore-carnivore ratio

The maintenance of a balanced herbivore-carnivore ratio in a conservation reserve is critical for ecosystem health and biodiversity. This balance helps in sustaining the ecological processes that maintain the integrity of the habitat. Here are some key considerations for maintaining this ratio:

1. Habitat Management:

- Vegetation Control: Herbivores rely on plant material for sustenance, and overgrazing by herbivores can lead to habitat degradation. Proper management of vegetation types can ensure herbivore populations do not exceed the carrying capacity of the land.
- Water Availability: Herbivores are more dependent on water sources, and overconcentration around water bodies can cause overgrazing. Maintaining natural spread of water sources can regulate their population.

2. Predator Management:

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- Carnivore Presence: Carnivores naturally regulate herbivore populations. Maintaining an adequate number of apex predators ensures herbivores do not reach unsustainable levels, which can lead to overgrazing and negative impacts on the environment.

- Restoring Carnivores: In reserves where predators have been removed or are in low numbers, predator reintroduction programs can help restore balance. This helps reduce herbivore populations and increases the health of plant life.

3. Monitoring Populations:

- Population Surveys: Regular monitoring of both herbivore and carnivore populations helps in detecting shifts in the balance. Surveys can be used to track population densities, health, and movements.

- Species-Specific Needs: Herbivore species, such as grazers, have different dietary needs and space requirements compared to browsers. Carnivores, such as apex predators need sufficient prey and large territories. Understanding these needs is crucial for effective management.

4. Research and Adaptive Management:

- Research: Continual research into the specific ecological requirements of herbivores and carnivores in the conservation reserve is essential. Understanding seasonal patterns, breeding rates, and migration habits will help managers make informed decisions.

- Adaptive Management: The approach to maintaining the herbivore-carnivore ratio should be flexible. Conditions change over time (e.g., climate changes, food availability), so adaptive management strategies are crucial to responding to new challenges.

7. Tourism and Recreation Management

Goal: Promotion of eco-tourism that benefits local communities while minimizing the impact on wildlife and habitat quality.

Designated Observation Areas: Creating designated bird-watching platforms, observation towers, and trails to minimize disturbance to wildlife while promoting tourism.

Educational Signage: Placing informational boards at popular sites to educate visitors about local species, ecosystem services, and conservation efforts.

Tourist Regulations: Enforcing restrictions on visitor behavior, such as noise levels, littering, and area access, to minimize the ecological footprint of tourism activities.

8. Emergency Response and Conflict Management

Goal: Proactively addressing human-wildlife conflicts and respond to emergencies to reduce damage to both wildlife and communities.

Rapid Response Teams: Establishment of teams for immediate response t[illegible] conflicts (e.g., animals entering villages) and emergencies like forest fires.

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Conflict Resolution Mechanisms: Developing a structured process for resolving human-wildlife conflicts, including compensation, relocation of problem animals, or installation of deterrents.
Wildfire Prevention: Implementation of controlled burning and firebreaks in fire-prone areas within the corridor to reduce the risk and impact of wildfires.

9. Financial and Resource Mobilization
Goal: To ensure sufficient and sustainable funding for corridor management through public and private partnerships.
Public-Private Partnerships: Engaging businesses and NGOs in funding corridor conservation, potentially in exchange for eco-tourism opportunities or community development programs.
Conservation Grants and Donations: Seeking funding from national and international conservation organizations to support corridor management projects.
Community-Based Financing: Encouraging community-level funds or cooperative financing models for small-scale conservation efforts like planting and maintenance of trees, fencing, or monitoring.

Each thematic action contributes to the overall goal of maintaining functional and sustainable wildlife corridors, ensuring that these pathways support species diversity, ecosystem health, and coexistence with human communities. By implementing a well-rounded corridor management strategy, conservation efforts can meet ecological needs and gain long-term support from local populations and governing bodies.

5.1 Action portfolio for maintaining functionality:
An action portfolio for maintaining the functionality of a conservation reserve focuses on protecting its ecological integrity, enhancing biodiversity, and ensuring sustainable management. Here's a structured plan:

5.1.1. Habitat Management
Habitat Restoration: Rehabilitate degraded areas through afforestation, soil conservation, and water management.
Control Invasive Species: Monitor and remove invasive plant or animal species that threaten native ecosystems.
Maintain Ecological Connectivity: Establish wildlife corridors to ensure movement between fragmented habitats.

5.1.2. Biodiversity Conservation
Species Monitoring: Regularly survey and monitor populations of key species to assess ecosystem health.
Endangered Species Programs: Implement targeted recovery plans for threatened and endemic species.
Maintain Genetic Diversity: Support habitat management to prevent inbreeding and genetic bottlenecks.

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5.1.3. Sustainable Resource Use

Regulate Resource Extraction: Develop sustainable practices for the collection of non-timber forest products (NTFPs).

Community-Based Resource Management: Engage local communities in conservation efforts through co-management programs.

Eco-tourism: Promote low-impact tourism that generates income for conservation without degrading the environment.

5.1.4. Climate Adaptation and Resilience

Climate-Smart Conservation: Integrate climate change considerations into reserve management plans.

Enhance Carbon Sequestration: Implement practices like reforestation and wetland restoration to combat climate change impacts.

Monitor Climate Effects: Track shifts in species distribution and habitat conditions due to climate change.

5.1.5. Human-Wildlife Conflict Mitigation

Buffer Zone Development: Create buffer zones with sustainable land use practices around the reserve.

Compensation Programs: Provide timely compensation for losses due to wildlife to foster community support.

Awareness Campaigns: Educate local populations about living harmoniously with wildlife.

5.1.6. Infrastructure and Surveillance

Improve Infrastructure: Build and maintain anti-poaching camps, patrolling tracks, and waterholes.

Use Technology: Employ drones, GPS collars, and camera traps for monitoring and surveillance.

Strengthen Enforcement: Train and equip forest guards to prevent illegal activities like poaching and logging.

5.1.7. Community Engagement

Participatory Management: Involve local communities in decision-making and benefit-sharing from conservation initiatives.

Capacity Building: Train community members in sustainable livelihoods and conservation techniques.

Cultural Integration: Recognize and integrate local traditions and knowledge in conservation efforts.

5.1.8. Policy and Governance

Review and Update Policies: Align reserve management strategies with national and international conservation goals.

Strengthen Legal Protections: Enforce laws to prevent encroachment, illegal resource extraction, and wildlife trade.

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Collaborate Across Borders: Work with neighboring reserves or transboundary areas for species with large ranges.

5.1.9. Research and Knowledge Management

Scientific Studies: Conduct research on ecosystem dynamics, species interactions, and reserve carrying capacity.
Knowledge Sharing: Develop an accessible database for researchers, managers, and policymakers.
Citizen Science: Encourage local participation in monitoring and data collection.

5.1.10. Monitoring and Evaluation

Performance Indicators: Develop metrics to assess biodiversity, ecosystem services, and community involvement.
Adaptive Management: Regularly review and update management practices based on M&E findings.
Stakeholder Feedback: Use input from all stakeholders to guide improvements.
This action portfolio balances ecological, social, and economic considerations, ensuring that conservation reserves maintain their ecological functionality while benefiting local communities and supporting sustainable development.

5.2 Action portfolio for active management

An Action Portfolio for Active Corridor Management includes a range of targeted actions aimed at sustaining and enhancing wildlife corridors to facilitate safe and effective wildlife movement, habitat connectivity, and ecological balance. This portfolio typically combines habitat restoration, regulatory enforcement, community involvement, and technological solutions. Here is a structured portfolio that can serve as a comprehensive framework:

1. Habitat Restoration and Maintenance

Vegetation Restoration: Regularly plant native tree and shrub species along corridor paths to enhance habitat quality and connectivity. Focus on species that provide food, shelter, and nesting sites for local wildlife.

Waterbody Management: Restore and maintain ponds, streams, and wetlands within corridors to support aquatic life and provide water sources for migratory and resident wildlife.

Control of Invasive Species: Actively remove or manage invasive plant species to prevent them from overtaking native flora. Introduce controlled burns or mechanical removal in particularly affected areas.

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2. Community Engagement and Education

Local Conservation Programs: Organizing community programs to educate local residents on the importance of wildlife corridors. Conducting awareness drives to minimize disturbances in or near corridors, including activities like noise control and littering prevention.

Community Incentives: Offering of incentives, such as payments or community grants, for communities actively involved in corridor conservation or sustainable land management practices.

Stakeholder Collaboration: Engaging local leaders, farmers, and landowners in conservation decision-making. Develop agreements with landowners for corridor maintenance or restricted land use to enhance corridor effectiveness.

3. Monitoring and Research

Wildlife Population Monitoring: Implementing regular censuses and track animal populations within corridors to identify changes in species abundance, health, and behavior.

Habitat Quality Assessments: Use of remote sensing, field surveys, and environmental indicators to evaluate habitat quality, including plant diversity, water quality, and food availability.

Technological Monitoring Tools: Utilization of GPS collars, camera traps, and drones to monitor wildlife movements, assess corridor use, and detect potential threats like poaching or illegal logging.

Installation Of Trap Camera

Camera traps in a conservation reserve is an effective method for wildlife monitoring, studying animal behavior, and supporting conservation strategies. Here's a general outline for the installation process, including key considerations:

1. Objectives of Installation

- Wildlife population monitoring
- Species inventory
- Poaching detection
- Behavioral studies
- Habitat use analysis

2. Equipment Needed

- Camera traps (infrared for night vision preferred)

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- Mounting straps or brackets
- Memory cards (high capacity, depending on usage duration)
- Batteries or solar panels
- GPS device (for location logging)
- Notebook or mobile data app (for recording site info)

Site Selection: Choose locations based on-

- Animal trails, water sources, feeding areas
- Prior knowledge of animal movement
- Areas of concern (e.g., human-animal conflict zones or poaching hotspots)

4. Placement Guidelines

- Height: Usually 30–60 cm (1–2 feet) off the ground for medium to large mammals
- Angle: Perpendicular to trails for best side-profile captures
- Distance: Aim for 3–5 meters from expected animal path
- Camouflage: Use natural foliage or non-reflective covers to avoid detection
- Minimize Disturbance: Avoid altering surroundings too much during setup

5. Data Management

- Log each camera's GPS coordinates, ID number, and settings
- Regularly check cameras to replace batteries and cards (every 2–4 weeks, depending on activity and battery life)
- Store data systematically: by date, location, camera ID

4. Conflict Mitigation and Emergency Response

Conflict Resolution Teams: Establish rapid response teams to address human-wildlife conflicts, such as animals entering farms or villages. Provide guidance on deterring wildlife safely and minimizing damage.

Emergency Resources: Stocking of corridor areas with resources like fire-fighting equipment and first-aid kits to respond to emergencies, such as wildfires or animal injuries.

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Deterrents and Alarms: Installation of sound or visual deterrents in areas with a high incidence of human-wildlife conflict to prevent animals from approaching villages, farmland, or other populated areas.

5. Sustainable Resource Management

Water Resource Allocation: To Ensure sustainable water extraction practices in and around corridors to maintain adequate water sources for wildlife while meeting community needs.

Sustainable Harvesting Programs: Implementation of guidelines for sustainable harvesting of non-timber forest products (e.g., medicinal plants, fruits) within corridor areas to reduce habitat disturbance.

Regulated Grazing: Working with local communities to establish rotational grazing practices that reduce overgrazing within corridors, maintaining plant cover and habitat quality.

6. Promotion of Ecotourism and Education Initiatives

Designated Wildlife Observation Sites: To Set up designated viewing platforms, bird-watching towers, and trails to channel visitors to specific areas, reducing habitat disturbance elsewhere in the corridor.

Educational Signage and Materials: Installation of information signage on local flora, fauna, and ecosystem functions at entry points and observation sites to educate visitors about corridor conservation.

Eco-Tourism Guidelines: Development and enforcement of visitor regulations that promote respectful and minimal-impact interactions with the environment, such as noise control and restrictions on waste disposal.

7. The Boundaries:

Owing to lengthy boundary, clear demarcation of the forest area from the adjoining landscape is essential. In addition to construction of boundary walls proposed in the plan, construction of permanent RCC boundary pillars indicating the distance and bearing will be taken up on a priority basis. This activity will help in solving certain disputes that will eventually rise in course of time.

The area under conservation reserve is 13100.00 Ha. This forest Block is declared as protected forest by Gazette of State Govt dated 13-04-1964 it is declared as conservation reserve notified under section 36A of Wildlife (Protection) Act, 1972 vide notification dated 09-02 -2012 on 13100.00 Ha.

The plan is proposed for the Shakambhari Conservation Reserve, Sikar Rajasthan.

(i) DGPS survey of the pillars should be conducted and recorded.

(ii) The forest lands of PA should be surveyed and demarcated using boundary pillars.

(iii) The areas around birds breeding and Panther should be developed as in it is latecore area.

(iv)The PA boundary should be surveyed and demarcated using boundary pillars.

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(v) The proposal for Eco Sensitive Zone will be prepared as per prevailing laws and rules and in future it will be sent to the competent authority for approval.

8. Zonation

The conservation reserve area is treated as per approved working plan year 2012-13 to year 2021-22. This conservation area treated and managed as single zone.

All the management, conservation, protection, developmental and ecotourism activities will be controlled and managed from Range Office. Dense forest area at some spots in the reserve. Dhok, Salar, google, kumtha, palash, Juiliflora, thorny species, old water bodies, grass species, adjoining office of Forester naka, Facilities like Watch Tower, Water Holding Structures, some encroachments, old, pucca talab, old wells, old plantations and some illegal mining pits are present in this zone.

In old times, hunting of tiger was common at Shikar hodi and this shows that presence of tigers were there. Presently movement of panther, Bluebull, hyena, fox, peacocks, cats, porcupines, reptiles, mammels, birds, amphibians in the area.

5.2.8.1 ZONE PLANS

Eco-trails are connected to water holes to promote tourism activities. Office of the, Forester, Facilities like Watch Tower, Nursery, Wash Rooms, Water Holding Structures all activities like Building construction works, pucca johad renovation, Water holes, Gajlars, Watch Tower, view points, sign-boards, fire lines, Eco-trails, vriksha Kunj, plantation along inspection path, ANR plantation, Grasses, plantations of silvi- pastoral species, SMC works and alien species, construction of waterholes, view points, talai, watch tower, ecotourism activities IGA by SHG, water tanks, rescue center, Pucca boundary, solar system, solar tubewell, renovation of old structures, Pucca wall, biodiversity closers, eradication/singling of ProsipisJuliflora, Interpretation Center with refreshment and other similar activities are proposed in management plan for 10 years for this Zone. All ecotourism activities will be managed from near ranges office. Grazing will not be permitted in the zone and action against encroachers will be taken up under provisions of the Wildlife Protection Act, 1972.

The management strategies for PA would be

a) Relocation in the all three zones as per relocation package approved by the state government
b) Creation of biodiversity closures in conservation reserve area for ideal habitat of panther and other wildlife.
c) Protection will be accorded a top priority in the zone.
d) Tourism activity would be regulated in the zone.

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e) Research activities pertaining to behavior of species and management practices will be taken up.

Management of out side area of PA

The out side area will be managed with the following objectives

i. The revenue lands should be identified within 10 km distance from the boundary of this PA
ii. The government lands / community lands will be restored to wildlife habitats.
iii. To develop pastures to meet the fodder needs of local people to reduce the biotic pressure on core zone.
iv. Develop eco-tourism programmers.
v. To help the villagers in developing good management practices for agriculture and animal husbandry so as to maintain the balance of ecosystem.
vi. Basic amenities for people by adopting mitigation measures

Finer classification of the area for ease of management prescriptions

There are 45 villages are situated on under pheriphery either fully or partially forming part of this PA. Every village is unique with respect to its composition, extent, caste equations etc. These 45 villages forming part of the Shakambhariconservation reserve area. PA will manage total three units that will beknown by their respective names. The management of the PA would be undertaken based on these management units, which represent each revenue village.

The following activities will be taken up as part of habitat protection and management, monitoring of wildlife and habitat and infrastructure development.

i. Each management unit will be treated as basic unit for habitat protection and management and monitoring of wildlife and habitat.
ii. Field staff will be allotted to each of these units and they will be made responsible for all the management interventions in these units.Eco development committees will be formed in these units.
iv. Micro plans will be prepared after conducting socio economic studies with the objective of conserving the endangered species like panther, restoring the ecosystem, ensuring compatible livelihood opportunities for local people and developing a regular mechanism for infrastructure and basic amenity development.

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V. Management unit maps describing the boundaries, infrastructures, settlements, encroachments and resources will be prepared for each of the units.

vi. Wildlife population estimation using standard techniques like transects and sign surveys and habitat monitoring using standard techniques will be carried out.

vii. The records of basic amenities available for each unit will be maintained

viii. Employment generation and skill up gradation programmes will be taken up at the management unit level.

5.2.8.2 THEME PLANS

This semi arid ecosystem is characterized by the grassland - sand dunes woodland communities. Interactions between these communities have resulted in conditions that are favorable for sustenance of many life forms. Managing these conditions to sustain the biodiversity of this place becomes the central component of PA management. Besides habitat management, issues like protection, fire, grazing, encroachment, man-animal conflict, animal population, wildlife health, etc., are equally important. Hence, these themes are considered as overlapping the entire area and theme plans for the same is prepared accordingly. Physical and financial targets, map of the zone are annexed as annexure XIII, annexure XIV.

5.2.9. MANAGEMENT OF HUMAN SETTLEMENT IN and AROUND THE CONSERVATION AREA

(i) There are some encroachment inside the conservation reserve and for the better management of conservation reserve and wildlife.
(ii) It has to be ensured that the basic facilities for a living around the PA are provided to the resident communities in accordance with the provisions in the laws in practice.
(iii) The benefits of conservation must go to the local communities. All the employment opportunities should be given to the local communities. Self help groups, EDC/VFPMC'S will look after and manage all the ecotourism and developmental activities, management activities inside the conservation reserve. Ecotourism activities will be carried out with the help of SHG & EDC. EDC will decide the guideline for ecotourism in their village meeting.
(iv) In cases where the nearest villagers do not cooperate with the works of the PA, people from adjoining villages should be given the opportunity.

5.2.10. MANAGEMENT OF HUMAN SETTLEMENT IN AND AROUND THE PA

(i) It has to be ensured that the basic facilities for a living are provided to the resident communities in accordance with the provisions in the laws in practice outside PA
(ii) The benefits of conservation must go to the local communities. All the employment opportunities should be given to the local communities.

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(iii)In cases where the nearest villagers do not cooperate with the works of the PA, people from adjoining villages should be given the opportunity.

5.2.10.1 HABITAT IMPROVEMENT

5.2.10.1.1 Grass land management

(i) More inviolate areas will be created by chain link fencing for facilitating Panther habitat improvement, breeding of birds as well as for the restoration of degraded grasslands and jaal.
(ii) In the zone, the grassland will be maintained in the optimum density and at optimum height desirable for the feeding and breeding of wildlife like Panthers and birds and fodder species in plantations be give top priority.
(iii) The diversity of the herbaceous and perennial shrubby vegetation in the core zone will be maintained in the levels desirable for the wildlife like Panther, chinkara and birds as decided based on scientific studies.
(iv) Grassland pastures will be developed in the area by planting and seed sowing the palatable indigenous grasses species.
(v) Villagers will be allowed to harvest the grasses from peripheral area of PA as part of scientific management. This will help in minimizing the biotic pressure on core zone. However this will not be permitted during the breeding season of panther and BIRDS.

5.2.10.1.2 Management of the Invasive Alien Species

(i) Local villagers will be employed in all operations through EDCs for removing the Invasive Alien Species
(ii) Prosopis juliflora which is local in this area, will be eradicated from the area using manual and mechanical means.
(iii) The firewood will be distributed to the villagers for their bonafide livelihood uses.

5.2.10.1.3. MANAGEMENT OF ANIMAL POPULATIONS:

WILDLIFE HEALTH:

Regular vaccination camps for cattle should be carried out in the villages to prevent outbreak of diseases and possible spread to wild animals.
(i) Education and awareness programmes will be conducted in villages to reduce the number of unproductive cattle and bring in productive local varieties

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(ii) Artificial waterholes will be created for wild animals in various places during pinch period.

(iii) An animal rescue centre already working in the conservation area.

(iv) Equipment for animal immobilization will be procured and staff will be trained in capture and restraint of animals

(v) Trainings will be given to the field staff in diagnosing the symptoms of disease condition in animals.

(vi) Population of species having reached undesired levels will be controlled.

Rescue centres and Treatment facilities

The role of rescue centres and treatment facilities within conservation reserves is vital to the success of conservation efforts. These directly support ecosystem health, species protection, and scientific research.

1. Wildlife Rescue and Emergency Response

- Provide immediate care to injured, orphaned, or sick animals found within the reserve.
- Respond to road accidents, poaching injuries, forest fires, or natural disasters.
- Prevent suffering and improve survival chances of individual animals, especially endangered species.

2. Rehabilitation and Release

- Rehabilitate rescued wildlife with the goal of returning them to their natural habitat within the reserve.
- Help maintain healthy wildlife populations by reducing unnatural mortality.
- Use soft-release enclosures and post-release monitoring to ensure success.

3. Conservation of Endangered Species

- Act as safe zones for critically endangered or vulnerable species.
- Support captive care, breeding, and species recovery programs.
- Example: Hand-raising orphaned rhino or elephant calves for eventual release.

4. Disease Surveillance and Health Monitoring

- Monitor and treat diseases that could threaten entire populations.
- Act as frontline centers in detecting and controlling zoonotic diseases or disease outbreaks.

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- Work with researchers to track disease patterns and plan vaccinations or quarantines if needed.

5. Human-Wildlife Conflict Mitigation

- Rescue wild animals that enter human settlements and safely relocate them back to the reserve.
- Reduce retaliatory killings by providing an ethical alternative for conflict resolution.
- Collect data to help map conflict zones and develop long-term solutions.

6. Research and Data Collection

- Support scientific studies on wildlife health, behavior, ecology, and stress responses.
- Provide real-time data for conservation biology, veterinary sciences, and ecosystem health assessments.
- Collaborate with universities and conservation organizations.

7. Education and Community Involvement

- Serve as outreach centers for local communities and students.
- Raise awareness about wildlife protection, conservation laws, and ethical coexistence with nature.
- Build trust and engagement with nearby populations, crucial for reserve success.

5.2.10.1.3 PROTECTION PLAN

The majority of problems faced by the area in protection are because of the mining zone in the area, various open paths inside the PA.

Protection strategies to control poaching

i. Joint patrolling with Police and staff around the conservation area.

ii. All the Forest Guards and Asst. Foresters should watch out for signs of in and around their respective areas of jurisdiction. Any suspicious activity would be conveyed to the concerned Range Officer who will undertake necessary steps.

iii. Every Forest Guard and Asst. Forester should keep informers in the vill[illegible] they will be rewarded for the true information from the secret fund.

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iv. RO should patrol the poaching prone areas both inside and outside the PA, keep a track of the movement of known poachers, and check the camps and hotels that serve meat in their menu and create fear in the minds of people as well as strive to arrest the known poachers.
V. Any public who gives vital information about poachers will be rewarded and the identity of the informers will be kept secret.
vi. A control room should be established at the Range office which is situated inside the PA and the phone number of this control room should be widely publicized.
vii. DCF will attend the crime meetings of the SP and sensitize the Thanedars regarding control of poaching.
viii. The muzzle loader guns available in the district should be asked to be surrendered as they are used in poaching. Necessary communications should be made in this regard
ix. NOC for new gun licenses should be given to revolver and pistols only by the DCF.
X. During winter months, regular patrolling should be done by the field staff, RO in the PA where rare and endangered species of fauna and flora are found.

5.2.10.1.4 MEASURES TO CHECK POLLUTION:

The rules of eco-sensitive zone will be applied in checking the pollution in the designated areas. City waste water and dead animals should not come inside the PA, in this regard, proper measures should be taken by District collector, Nagar parishad and the concerned department. RO, PCB Sikar will look after pollution issues.

Land pollution

Signage should be installed in the tourism areas to sensitize the tourists about keeping the area clean.
1. Sufficient number of trash bins should be kept for collecting the trash along the tourist roads and tourism spots inside the PA
ii. The food waste generated by the camps should be disposed off by the respective camps strictly in accordance with the Solid Waste Management Rules. Necessary communication in this regard should be made with the Rajasthan Pollution Control Board by the DCF.

Other types of Pollution

Use of pesticides in the peripheral village area will be regulated in adjoining areas as per the prevailing rules and regulations. Use of high intensity light beams disturbing the light will be checked as per the prevailing rules.

5.2.10.1.5 MANAGEMENT OF INFRASTRUCTURE AND COMMUNICATION NETWORK

1 Vehicles

One four wheelerand two motorcycles are using by the field staff for protection and management of Shakambhariconservation reserve area. Range office, Sikar have been allotted two motor cycles and his headquartor is also situated in Sikar.

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2 Buildings

Range building is exist adjoining to the area and other required buildings like three forest guard chowki, three watch towers and others building as interpretation center, staff residential building, Naka etc are proposed in the 10 years plan.

3 Wireless communication

The proposal for Eco Sensitive Zone will be prepared as per prevailing laws and rules and in future it will be sent to the competent authority for approval.

5.2.10.4 ECOTOURISM, INTERPRETATION AND CONSERVATION EDUCATION

5.3.10.4.1 Identification of the tourism zone

a) Tourism activities will be promoted in the following management units during the plan period Pratappura, Gadrata, Papurana, Babai, Mandana, Kalota, Burka, Bagor and Sikarcity.

b) Nature trails and wildlife watch vehicle safari routes will be marked in the blocks mentioned in Section 8.3.4.1 (a) and developed to provide maximum wilderness experience to the tourists. Along these nature trails, signage and view points with stone benches that blend with the surroundings should be established to provide the visitors with resting places to enjoy the beauty of the PA and relax.

5.2.10.4.2 Infrastructure Development

a) An interpretation center should be constructed at entrance of conservation reserve area.

b) The interpretation center will display the landscape, vegetation, wildlife and culture of the desert. Apart from visuals and signage, this centre will have a facility to screen movies as well.

c) The world class Interpretation Centre will display information about Geological history of Sikarand PA.

d) Short films on PA/wildlife should be made for uploading in the social media and other forums to publicize it as a tourism destination.

e) An animation film has to be created about the Geological History of Fatehpur.

f) Informative signboards will be displayed at important tourist spots in the city as well as inside the PA. Suitable signboards will also be put up near Railway station, Bus stand etc.

g) Watchtowers will be constructed at some strategic locations and protection posts which will be open for tourists for wildlife watching through telescopes.

h) Observation hides will be constructed using natural material near the water guzzlers/waterholes inside the closures and will be available for genuine w[illegible]urists for photography. An authorized nature guide should be hired by the tourists in such cases as well.

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5.2.10.4.3 Interpretation and Publicity Activities

a) Attractive signage; both directional as well as informative, will be established in and around the CR
b) Information signage will be established in various important locations in the Sikarcity.
c) Thematic brochures will be printed for sale as well as distribution to tourists and students.
d) Information about the conservation area will be regularly published.

5.2.10.4.4 Conservation Education

a) Regular Nature Camps will be conducted for various target groups like school and college students, teachers, media persons, lawyers etc.
b) Celebration of auspicious days of forestry and wildlife importance will be celebrated in schools and education programmes will also be conducted in collaboration with NGOs.
c) Staff will also be educated on various issues by getting expert Volunteers.
d) Professionals should be hired for the documentation of the biodiversity of the CR

5.2.10.4.5 Income generation activities

The local population is to be motivated to undertake and expand eco-development activities. It is proposed to undertake activities like popularization of non - conventional energy, varietal improvement of cattle, employment generation by involving the villagers in tourism related activities, community development programmes etc. in a phased manner, for a period of ten years. SHG will work under EDC/VFPMC to run the tourism and other IG activities.

5.2.10.5 VILLAGE LEVEL SPECIFIC STRATEGIES

5.2.10.5.1 Entry Point activities

a) Entry point activities should be decided after conducting a general body meeting at the village.
b) Development of pasture lands outside the fenced area should be done.
c) Veterinary and human health camps will be organized in villages around the PA.

Entry point activities

Entry point activities in a conservation reserve refer to the initial interventions or projects that engage the local community and lay the groundwork for long-term conservation and sustainable development. These activities are typically low-cost, quick-to-implement, and address immediate needs of the local population to build trust and encourage participation in conservation efforts. Some common entry point activities:

1. Awareness and Education Programs

- Environmental education workshops in villages and schools

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- Nature camps or guided tours to raise awareness
- Training programs on biodiversity and sustainable practices

2. Community Development Initiatives

- Construction or repair of community infrastructure (e.g., water tanks, footpaths, solar lighting)
- Support for education (e.g., school supplies, scholarships)
- Health camps and sanitation drives

3. Livelihood Support

- Promotion of sustainable livelihoods like eco-tourism, beekeeping, or organic farming
- Skill development workshops (e.g., tailoring, handicrafts, agri-based processing)
- Formation of self-help groups (SHGs) or cooperatives

4. Natural Resource Management

- Soil and water conservation activities (e.g., check dams, bunding)
- Afforestation or reforestation efforts involving local species
- Sustainable grazing and fuelwood collection programs

5. Capacity Building

- Training community members as eco-guides or forest guards
- Workshops on wildlife conflict mitigation
- Involving local youth in biodiversity monitoring

These entry point activities help create a positive rapport between conservation authorities and local communities, ensuring smoother implementation of more extensive conservation projects in the future.

5.2.10.5.2 Proposed eco-development activities

a) Promote use of non conventional energy (biogas plants, smoke free chullas, solar lights, and solar cookers, LPG etc.) in order to reduce fuel dependency of fuel wood on native vegetation.

b) Introduce phased reduction of scrub livestock and improvement of cattle breeds (through controlled fertilization of female stock in proper health and age with [illegible] observed

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local breeds, aided by sterilization of scrub bulls by way of organizing cattle improvement camps.
c) Children from the adjoining villages are to be developed as guardians of the nature. Programmes to educate and encourage them are to be undertaken by involving institutions like WII, BNHS and WWF.
d) Local handicrafts will be promoted as tourist souvenir which can be sold through memento shops of the PA.
e) The villagers may be prompted to constitute self-help groups and can be provided assistance depending on their contribution in the activity. Income generation activities may be taken up by the groups with coordination from other agencies.
f) Every entry ticket imposed into this area is inclusive of an eco-development surcharge. This money is earmarked to carry out eco-development works in the surrounding villages.
g) Eco- huts at nearby villages/ city would be run by the EDC on a trial basis and based on the results future plans will be decided

5.2.10.6 *Prosopis juliflora* Eradication:

1. *Prosopis juliflora* can be used as raw material for generating electricity. The branches of *Prosopis juliflora* can be converted into partial powder and used as fuel for baking bricks.
2. By providing "de-seeding" machine to farmers/panchayat, seeds can be removed from the pods of Prosopis juliflora and nutritious animal fodder can be made from the pods and the seeds can be used as animal fodder by burning or boiling them.
3. Wherever there are heaps of Nilgai, Chinkara etc., they should be burnt to destroy the seeds of Prosopis juliflora.
4. Farmers should be made aware that organic fences should not be made from this species.

5.2.10.6.1 Elimination by smothering method:

If elimination of juliflora is not possible by physical methods, then fast growing and light seeking species (Jatavdaha Saphij Kamund kamat) should be planted in the area. Before planting, weeds should be removed with roots from the planting site and in the surrounding 1 m radius with the help of JCB. When the planted plant increases its height and casts shade on the weeds, the light seeking weeds will be eliminated automatically due to the shade. This method will require a lot of patience, selection of right species and accurate management and monitoring.

5.2.10.6.2 Elimination of other weeds:

If financial availability is there, then other weeds will also have to be removed by adopting the principles given earlier. If financial availability is not there, then provision for their elimination should be made in the upcoming plan. But it has to be mentioned here that unless there is a 'landscape approach', it will be difficult to get rid of weeds. Therefore, it is necessary to bring such plans that weeds should be removed from every place in forest area, pasture area, agricultural area, inhabited area and other types of land. By removing weeds from one place and leaving it at another place, the weed seeds will grow again in the left

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places. This means that the lands which are not under the control of the forest department but are related to other departments or agencies, the "landscape approach" cannot be successful without taking all of them together. Without the cooperation of the District Environment Committee and the District Administration, it is not possible to eradicate weeds from the entire landscape.

Converting invasive weed species into economic benefits by removing them through biological methods:

1. The grown trees/bushes/roots of Prosopis juliflora should be converted into coal through scientific methods and disposed of as per the prescribed method.
2. *Prosopis juliflora* can be used as raw material for generating electricity. The branches of *Prosopis juliflora* can be converted into partial powder and used as fuel for baking bricks and the wood of Julieflora can be used for making furniture.
3. By providing “de-seeding” machine to farmers/panchayat, the seeds can be removed from the pods of *Prosopis juliflora* and nutritious animal fodder can be made from the pods and the seeds can be used as animal fodder by burning or boiling them.
4. Vermicompost is also prepared using other invasive species which can be prepared with the participation of people to earn economic benefits.

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Chapter 6
Implementation strategy
(Dividing CR into one sector having villages in single cluster)

6.1 Inclusive Management

6.1.2 Actions in sync with para

6.1.2.1 Action portfolio for maintaining functionality

6.1.2.1.1 Day to Day monitoring (traditional and state of the art)

Monitoring

Monitoring of Animal Population

Annual monitoring and population estimation of all major species of animals is carried out every year in the month of May by staff of the Forest Department at the time of wild life census. The procedure to be followed in this exercise is developed as an SOP for convenience in execution and attached as a different chapter in this plan.

Monitoring of vegetation

Regular vegetation monitoring should be done as per the designed SOP.

Monitoring of weather parameters

Meteorological data collection has not done in the area but the data collected by Meteorology Department at various stations in Sikar combed obtained.

Monitoring of visitor's data

After the start of tourism at the area database of the visitors should be maintained. Visitor carrying capacity of the PA has to be calculated and the tourists should be managed accordingly. The problems arising out of visitor movement are also to be studied and solutions sought for.

Wildlife of various species is found in large numbers in forest areas and revenue areas (regional forest division and revenue). There is no specificity for wildlife management in these areas. Wildlife protection is ensured along with general regional forest management. Therefore, for solid and scientific management of wildlife in the district, it is very important that the actual number of wild animals is found out by employing fully trained and skilled wildlife experts. During this, data related to estimated number of wild animals of all categories, identification of their natural shelters, their majority areas, their roaming and local breeding areas, traditional and current areas of their food availability etc. should be collected and wildlife map should be prepared on the basis of these. Only on this basis, a solid plan of wildlife management can be prepared and implemented. Special monitoring and protection of these sites has to be done. Forest guards and foresters related to the area also have to be given necessary training related to wildlife. Since the wildlife found in these areas is very important, it has become necessary to plan for their protection and management. Therefore, the following action plan is proposed for their management.

(1) For wildlife found in forest areas.

(2) For wildlife found in other areas (revenue).

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Management plan for wild animals in forest areas

For wild animals in protected forest areas:

(a) After carefully studying the wildlife census report from time to time, it has come to light that various types of wild animals have been found in sufficient numbers in each range area. Areas should be identified and various works should be done there as per wildlife management. Each identified area should be at least 500 hectares. Based on the availability of wild animals, the wildlife habitat area of these areas can be increased even more than this, in some ranges this area can be at more than one place, which should be determined by the wildlife expert/wildlife division. (pp) After carefully selecting the areas, deer proof fencing should be done for the protection of the area. Thereafter, works should be done under habitat protection and development, so that the wild animals found there not only get protection, but their housing, food, water facilities can be developed. As a result, these areas will also work as "core areas" for the wild animals in future and after the wild animals are established in sufficient numbers, they can also expand to other areas. These works include construction and maintenance of fire strips, construction and maintenance of routes for movement, construction and maintenance of water holes for water, apart from this, small water points (guzzlers which are 1-1" deep) and round slopes of 6" to 10" depth should be made for the vultures to sit and for fodder, fodder species of plants and grass seeds should be planted. And fruit plants should also be planted in sufficient numbers.

(iii) These protected areas can also be used as translocation/rescue centers. In these, the wild animals caught or injured in the wild animal areas can also be released and adequate attention can be given to them, in this way the wild animals of the same area will be able to live and develop well in the protected area under the same conditions.

(iv) For this type of translocation work, it is mandatory to have at least one tranquilizer gun with supporting equipment and medicines in every forest division so that this forest division does not depend on any other forest division for this work. As a result, the desired protection can be provided to the wild animals at a fast pace. The auxiliary equipment should include a refrigerator and at least two ice boxes for safe storage and transportation of tranquilliser medicines, otherwise the expensive and locally unavailable medicines will become ineffective and it will also become difficult to procure them from far-off places on time. It is necessary to have at least one big and one small strong iron cage for transporting the captured wild animal, along with a suitable vehicle for transportation. It is also necessary to have a trained team for carrying out this work which should have at least 5 employees, who know well how to operate and maintain the tranquilliser gun. This training work should be conducted by the Wild Life Division and a refresher course should also be conducted every year so that the team can always remain trained for this work. (a) In these forest areas, there are such areas where water is available in sufficient quantity, hence aquatic animals (birds) come and migrate here even in winters. Hence, while selecting protected areas, such areas should also be identified and developed separately in such a way that water is available here throughout the year and the area should be developed in an ideal manner for the residence, food and breeding of these migratory birds, so that more and more native a[illegible]tory birds can be seen. For their protection, maintain the water supply by constructing Nar, Anicuts, Waterholes and Gazellers etc. at appropriate places in the forests.

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(b) The following facts are worth considering for day-to-day monitoring:-

- More security personnel are required for the protection of wild animals.
- It is proposed to ensure the security of forests so that facilities are available for breeding and resting of wild animals in the forests.
- There should be provisions for giving incentives to those who give information about poaching and illegal hunting.
- Cattle herders set up camps near waterholes in forests, due to which wild animals do not come for water and yearn for water. Therefore, camps for herders should be set up far away from waterholes, ponds etc.
- It is proposed to install walkie-talkies at all necessary places in the area and to provide mobile phones and vehicles to the regional forest officer.

Conservation Plan

Apart from all the management measures mentioned above, there is also a provision for the following special management in this conservation reserve.

(a) The area will be effectively closed by enclosing it with stone wall or trench fencing for 10 years.
(b) The deformed trunks will be mutilated.
(iii) If land conservation permits, dry check dams or bush fence check dams will be constructed.
(iv) Appropriate plantation will be done in the patches in between.
(v) Wherever possible, concrete walls will be constructed under MNREGA scheme.
(vi) Habitat development works will be done, anicuts, Nadi ponds etc. will be constructed.
(vii) To restore the ancient glory of the area, 1 sq. km. area will be separately enclosed by fencing.
Fodder grass and vegetables will be reestablished in it, ponds will be built and it will be made a translocation center. Wild animals from the sanctuary and other places will be released in it.

Administrative and financial arrangements

In this area, posts of an assistant forest conservator, range officer, 2 foresters, 2 assistant foresters, 10 forest guards and other staff will be established separately. Vehicles, buildings, posts etc. will also be provided for the staff. Financial provision for these protected areas will be according to this work plan approved separately. No financial provisions have been mentioned in this work plan.

Management plan for wild animals found in the revenue area

Apart from forest areas, there are many such places where a good numb[illegible] of w[illegible] animals migrate and roam. Many types of birds make their nests in villages/cities, espec[illegible] the birds that make nests in groups attract attention. Therefore, such trees/trees should be identified

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and special attention should be paid to them so that the general public does not damage the trees or their nests or try to drive them away.

Wild animals often come and go near water bodies from time to time, so by identifying such areas, the areas around them should also be developed as per wildlife management so that they can also get adequate protection and proper environment and can develop over time.

Apart from these areas, wild animals are also found in many ponds/big anicuts/rivers/sources etc. This includes various types of fishes, migratory aquatic animals (birds) and other amphibians. Some species are extremely important, therefore keeping this fact in mind, this area should be conserved and developed and trees of such species should be planted for its wild animals which are suitable for their habitat or food and in the course of time other species besides these wild animals can also use these as their habitat/breeding centre.

Necessary information and pictures of these wild animals should be displayed at convenient places in such areas so that the general public can also get information about them and they can also contribute to their conservation and development. Information about wild animals should also be made available to school students from time to time so that they can also get proper information about wild animals. Their details should also be made available to the media from time to time as per rules so that they can be widely publicised and propagated. There are many such areas in different places of this district, as mentioned above, which are waiting for conservation and development. Therefore, the Wildlife Division should identify such areas with the help of local people/administration, prepare a work plan for their planned development, get necessary approval on it and start the work so that the wild animals found in these less known habitats of this district can get protection and by maintaining their critical population, they can again make this district full of wild animals.

Problems In Protection of Wild Animals

There are various types of problems in the protection and conservation of wild animals, which are as follows:

Hunting

Wild animals sometimes come to populated areas, which poses a threat to their safety. Some people fulfill their desire of hunting by using some excuse or the other or by stealth. Birds, which are migratory, are also hunted.

Road accidents

Wild animals sometimes come on roads situated in the middle of or near forest areas. While crossing the road or roaming around, they get injured or killed by fast moving vehicles. The injured wild animals become weak to get food and water and many times their prey to time. Due to superstition, animals like cats have been seen to be crushed ve les when they cross the road. Monitor lizards, mongooses, snakes, and mongooses keep a such accidents. Unsafe water sources

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Wells, water tanks and pits are made at various places in the revenue area for various purposes, which are left open for some reason and no boundary wall is made for them. There is a high possibility of wild animals falling into them. Wild animals fall into them due to carelessness while roaming or while chasing prey or due to some other reason. They are saved if proper help is received on time, otherwise the wild animals are killed. Nowadays such incidents are increasing and a large number of wild animals are being killed.

Pollution

Due to increasing pollution of air, water and land, wild animals are also getting affected in large numbers and as a result of this, they become sick and die. Especially the plastic bags thrown away after use for carrying food items are eaten by wild animals. Birds swallow rubber bands. When animals injected with diclofenac sodium die, their meat proves fatal for vultures. One of the reasons for this is the lack of vultures in Sikar district.

Destruction of Habitats

The micro natural habitats of wild animals such as trees, bushes, burrows, caves, small water streams, drains etc. are getting destroyed due to human development activities. Wild animals are suffering heavy losses due to the continuous process of destroying micro habitats for dams, anicuts, road and path construction, mining, building construction and other works. Apart from this, agricultural expansion is playing a role in destroying natural habitats. There is also a decline in pastures. Species such as Vilayati Babul, Juliflora, Carrot Grass, Xanthium etc. are intruding into pastures and other habitats, leading to "habitat change" and "habitat destruction". It is necessary to save the original nature of habitats.

Electricity distribution system and lighting system

Due to the increasing steps of development, electricity production has increased, and in the process of its distribution reaching every village and hamlet, the network of electric poles and wires is spreading. Due to this, many times the free movement of wild animals is obstructed and sometimes wild animals get injured or die by colliding with electric wires and poles. Many times animals are also killed by electric current from the wires. Due to the arrangement of night lighting in villages/cities, many insects gather towards the light, due to which there is a decrease in insects in the outer areas and many insectivorous animals face adverse conditions of food.

Crop Protection Measures

To get a good crop, the use of chemical medicines, pesticides and fertilizers by farmers is continuously increasing. Apart from this, chemical medicines are also fed to dairy animals, as a result of which chemicals keep accumulating in their bodies, which affect other animals too, including wild animals. Insects like butterflies, bees etc. are killed by use of chemical medicines in agriculture, which has an adverse effect on activities like pollination.

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Humans Fear of Wild Animals

Humans have been harbouring misconceptions about wild animals for centuries, and are fearful of them without any reason. As a result, due to the fear, confusion and superstitions, many innocent wild animals are killed, such as many non-poisonous snakes, lizards etc. Apart from this, even if many ferocious animals are hiding somewhere due to some reason, humans kill them without any reason to reduce their fear. This tendency can be stopped by public awareness and public education. Destruction of breeding and feeding places

The breeding and feeding places of wild animals are also being destroyed gradually by humans. Humans have started using these places for their own various purposes, as a result the nature of these places has been destroyed and these places are no longer usable for wild animals. Apart from this, due to unwanted entry and interference by humans, wild animals have also started avoiding using these places and this has adversely affected the number of wild animals.

Decrease in Religious and Co-Existence Feelings

The feelings of co-existence are continuously decreasing in human society which is moving on the path of development, and this is reflected in its working methods. At present, the feeling of mutual cooperation, kindness and doing good is decreasing day by day in human society and it is becoming selfish. In its thinking, the feeling of helping wild animals has become more important than the feeling of protecting them.

There is no value of wild animals because it is not getting any direct economic or other benefit from them, rather in his view, the wild animals are causing him economic loss by hunting his animals and destroying his crops, although the department provides compensation as per rules in such situations.

Therefore, there is an urgent need to explain the importance of wild animals by maintaining constant contact with the general public and especially the residents living on and near the borders of wild life areas. Earlier, humans knew how to live with wild animals and have lived with them for centuries, but now in this changing context, there has been a huge change in the lifestyle of humans, due to which it is becoming difficult for them to live with wild animals. They want to keep them away from their lives and try to ensure that there is no shelter for wild animals near them. Therefore, there is a need to tell the general public what is the contribution of wild animals in the ecosystem and what is their role in our existence.

Other Miscellaneous Reasons

- Apart from the above-mentioned main reasons, there are many other small and big reasons which pose a threat to the wild animals. In this era of development, many such constructions have been made which are harmful for the wild animals.
- The dams etc. being built for the development of agriculture, on one hand create the problem of displacement and on the other hand also bring about a change in the environment of that river. Apart from this, due to the laying of ca[illegible] animals fall into it and get injured or killed. Irrigation facilities bring about a change in its ecology. Hence, the habitat starts changing.

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- The new technology of commercial production of fish and the destruction of forests in the catchment also changes the ecology of water bodies. The conditions of the "water regime" are changing due to the excessive exploitation of groundwater. Efforts are necessary to maintain the conditions of the "water regime" by adopting appropriate groundwater conservation methods. Modern means of transport (increasing vehicles and road network), communication media and weapons have also affected the conservation of wildlife. Many wild animals are crushed on roads. Modern vehicles and the network of roads have created conditions for hunters to reach their prey and escape easily. Modern weapons have made hunting easier. Hunters do not miss the opportunity to misuse the expansion of communication system.

Measures For Wildlife Conservation

This management programme is suggesting measures for the above-mentioned factors that harm wildlife, which need to be deliberated upon and implemented on a wide scale:
Special efforts should be made to prevent incidents of hunting etc. through intelligence information system. Apart from forest areas, patrolling teams should also patrol such areas where wildlife often roams or is their habitat or food site. Areas where traditional hunter communities reside should also be monitored. There is a need for continuous public awareness campaign among the communities involved in hunting. Along with this, detailed information should be regularly collected on the following points about the villages situated in and around the habitat and roaming area of wildlife:

- Details of licensed and otherwise gun holders.
- Presence of hunting communities and their complete details.
- Special interest of any unknown person or group in the area.
- Information about the number of cattle and their movement etc.
- Complete details of the cattle herders. By keeping regular contact with them, information about the presence of wild animals, their movement, hunting etc. as well as the possibilities of their illegal hunting can be known.
- Apart from this, an intelligence system should also be developed so that timely information is received in this regard and hunters, poachers etc. can be caught on time.

Road Accidents:

Warning boards should be installed on the sides of the roads and the Public Works Department should also be warned in this regard that roads should not be constructed near the habitats of wild animals or special technology needs to be adopted. And if there is a need to make "underpasses" at various places on roads with abundant wildlife, speed limit should be determined and speed breakers should be made at various places. These areas should be monitored and effective patrolling should also be done by the police so that vehicles cannot run faster than the speed limit. If the driver of the vehicle causing the accident is at fault, his

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driving license should be cancelled under the Motor Vehicles Act and action should be taken under the Wild Life Act.

Construction of parapets on wells, tanks and pits:

Panchayat committees should be directed to identify such wells, water tanks or pits every year and either get them filled or get parapets etc. constructed on them so that the possibility of wild animals falling in them becomes negligible. The parapet should not be less than 0.60 m outside the land. Bushes near the wells should be kept clean so that wild animals do not come to roam near the wells. Dangerous wells should be covered with iron nets so that wild animals do not fall inside.

Pollution control:

Special efforts should be made for pollution control. Areas where pollution has spread should be identified and necessary action should be taken. Special efforts should be made through Panchayat Samitis for a pollution free environment so that their impact on the environment is negligible. Plastic bags should not be thrown here and there. Every possible effort should be made to prevent the entry of toxic substances into water holes. It is necessary to cover the flowing bitumen in the pits with a thick layer of soil. Many times, due to heat, wild animals get trapped in the flowing bitumen lying on the sides of the roads.

Protection of Residential Places

Residential places located in the revenue area should be identified and their database should be prepared and patrolling should be done at those places from time to time. Gram Panchayat/Panchayat Samiti should also be informed about this database so that the protection of these places can be accelerated. There is a need to take full cooperation of the local administration and police department for the protection of wildlife-rich areas of the revenue area.

Improvement in the electricity distribution system:

Electricity distribution should be managed in such a way that the minimum network of wires is spread. By laying underground cables in forest areas, water bodies and wildlife-rich areas, the incidence of electrocution can be reduced. For this purpose, policy formulation at a high level is required.

Crop protection measures:

A campaign should be launched to encourage farmers etc. in wildlife-rich areas to use indigenous or environment-friendly products for the safety of their crops and increase production, and special attention should be paid to this. This work should be done under a scheme. For this, they should be given information about 'eco-friendly' (environment-friendly) substances and the necessary loan should be made available without interest for their use and

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purchase. Heavy subsidy should also be given on these products. Apart from this, loan and subsidy should be given to those farmers only who use such products which do not contain any harmful elements and such products should be made available at the local level by cooperative or village panchayat only. Humans have fear of wild animals

Special efforts should be made to remove the misconceptions prevalent in human society. This should also be a part of the plan in which efforts are made to discourage the use of harmful chemical products. Till these misconceptions are not removed from the common people, wild animals will continue to be killed without any reason, hence all information, dissemination and propaganda in this regard should be a part of the plan. Many false beliefs and superstitions are prevalent in the society regarding cats, snakes, jackals, owls, bats. Wild animals are also used in folk magic. There is a great need to take initiative and create awareness among the people.

Protection of breeding and feeding places:

Wildlife-rich places in revenue area A positive attitude of the local Panchayat, local administration and police department is necessary for identifying these and protecting them. Remember that a large number of wild animals live outside the forest areas where the forest department has no control. For these areas, other government departments, voluntary organizations, and common people should all work together only then the wild animals can be saved.

To prevent wild animals from coming out of the forests, it is necessary that water storage sites (JanmatBhavsame) should be constructed at safe places in the forests so that drinking water can be arranged for them. These sites should be filled with water regularly and proper budget should be allocated to the forest divisions for this work.

Development of religious and co-existence spirit

For this work, priests of temples/mosques/churches of the village/town should be encouraged. They should be provided with such easy literature in local language in which conservation of wildlife is linked with religion and compassion towards animals. This will generate compassion towards wildlife along with religious sentiments among the co[illegible]ople and the feeling of co-existence will gradually develop over time. This will be abl[illegible]create a

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special place in every religion and will be able to make a huge contribution in wildlife conservation.

Other measures for conservation:

The active cooperation of the local honorary wildlife warden should be taken. The state government appoints honorary wildlife warden in the district under section 4(1) BB of the Wildlife Act 1972. At present, Shri Basant Kumar Lata has been appointed as the honorary wildlife warden in Sikar district from 06.2.2012. The forest protection and management committees of the entire district also need to be connected with the work of forest conservation in a more effective manner. There is a need to pay adequate attention to vaccination and fire safety measures every year within a radius of 5 km of the domestic cattle living near the wildlife habitats. The team should always be in a state of readiness for the rescue of wild animals that have fallen into wells or entered the population. For this, the regional forest officers should be given the right to arrange vehicles, catch them, spend money for their treatment and there should be a provision to reimburse the expenses incurred from the budget allocated to the Deputy Forest Conservator. A separate budget should be allocated under contingency at the Deputy Forest Conservator level so that it can be used in special circumstances. Due to lack of budget allocation, timely action is not taken, which creates difficulty in saving the wildlife. Also, cages, nets, torches, vehicles etc. should be available in addition at the potential forest area office with wild animals. A team should be deployed at the Forest Division office. All field staff should have the telephone numbers of senior officials available for communication. Field staff (forest guards, foresters and regional) should be provided with mobile phones. There is a need for adequate publicity of the Wildlife (Protection) Act. There is a need to provide accurate information to the general public about the problems that have emerged recently like bird flu, vulture extinction etc.

6.1.2.1.2 Safeguarding against intensive landuses

There is not any much threat of changes in land use in the protected area. Somehow, here are some ways to safeguard against intensive land use:

Protect natural ecosystems

Limit the amount of land available for conversion by:

Establishing protected areas

Recognizing the rights of Indigenous Peoples

Planning roads to avoid opening new areas for conversion

Integrating these measures into land-use plans

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Reduce land-use change

Address the drivers of ecosystem degradation and conversion by:

Combining incentives and disincentives

Developing context-specific measures

Increasing budgets for protected areas

Creating community-led forest monitoring and pasture management systems

Diversify rural incomes

Provide alternative incomes for rural populations, such as:

Poultry breeding

Honey production

Making furniture and household utensils from local materials

Encourage sustainable land use

Businesses can:

Work with farmers to adopt regenerative agricultural practices

Reduce food loss and waste

Commit to transparency in supply chains

Phase out deforestation and land conversion

Advocate for economic incentives and regulatory frameworks

6.1.2.2 Action portfolio for dealing with human-wildlife interface

SOP for Dealing With Man-Animal Conflict

Human-wildlife conflict results from the interface of wild animals and humans. It is a function of the population sizes of humans and wild animals. Given the rapidly increasing population of human in India, it is certain that this interface will expand in future; exposing wild animals to newer risks.

- Therefore, assessing and mitigating these risks become crucial for wildlife management and conservation in the shared habitats. The leopard in many such areas which are not traditional habitatranges of such felids make it compulsory for wildlife managers to be always ready forsuch unprecedented events. Whenever, there is news of any wild animaldepredation (especially carnivore) following protocol to be observed:
- Inform the local police administration through letter or message to [illegible] crowd

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- An Officer not below the rank of Range Officer/Naka in-charge should reachthe site immediately.
- Convincing advice should be given to the villagers to avoid further damage if necessary, immobilization team should be called to restrain the animal.
- Captured animal should be tagged with a PIT Tag before release.
- Manage Human-Wildlife Conflict according tothe advisory for management of Human-Wildlife Conflict (HWC).

The advisory for management of Human-Wildlife Conflict (HWC)
Management of Human-Wildlife Conflict

On 05th January 2021 has released the advisory for management of Human-Wildlife Conflict (HWC) in the country. The advisory makes important prescriptions for the States/ Union Territories for dealing with Human-Wildlife conflict (HWC) situations and seeks expedited inter-departmental coordinated and effective actions.

HWC situations is required as organised arrangement and action. It is in this context that following set of guidelines has been prepared for setting up of Human Wildlife Conflict mitigation and management plans in all the forest management units.

Conflicts occur more outside Protected Areas and reasons of this also are normally associated with the treatment of forests outside PAs. Intensity of human presence due to activities of harvest, regeneration and upkeep of forests, existence of human habitations as enclosures, grazing etc are some reasons for human presence in forests. Besides, human habitations along the forest fringes also face HWC.

In these circumstances, it is necessary that states institute a Human Wildlife Conflict Management Strategy on priority and in the first place, formulate Human Wildlife Conflict Management Plans (HWCMPs) for identified conflict zones, for primarily initial mitigation and quick response action. This can reduce the chances of HWC largely and can also inculcate confidence in forest administration apart from improving the interface with the communities.

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Long term measures for mitigation of Human Wildlife Conflict include improvement of forest habitats, better protection, enhancement of information and knowledge on the wildlife through research and at times population management based strategies. Such action are part of forest management and policy and legal enabling arrangement for such strategies are to evolve with time and need. However, short term actions are needed for quick response if and when incidences take place involving human beings or wild animals.

In this context, following basic components are suggested in this regard in the interactions held so far, as the primary tenets of management of human wildlife conflict, and should be adopted at the earliest in the States, in the areas identified as most vulnerable to begin with.

Salient features of the advisory

Basic tenets of the management action on Human Wildlife Conflict, to be put in place in the localities identified as vulnerable to the Human Wildlife Conflict situations.

Quick Response logistics

Publicity: Help lines. Public information on help lines and other reporting places and means in case of any conflict situation requiring support of forest department.

Hubs in place for receiving the information and onwards transmission for quick response - it can be set up in the easily accessible locations.

Personnel: equipment; mobility and communication in places accessible to potential areas of conflict. These teams may be suitably titled for example “Wild Life Rescue Teams” for easy identification.

Collaboration of local interested organisations should be welcome for such teams.

Clear Standard Operating Procedures (SoPs) for personnel manning the quick response teams. This must include command control hierarchy. on the spot command delegation, delegation for procurement of goods and services if and as required in the operational exigencies.

Intensive training for the personnel involved in this kind of tasks.

Rescue mechanisms

In case of human victims, arrangements for quick transport of victims for treatment to nearest possible place. Standing arrangements for such eventualities in the hospitals of the potential areas.

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For animal victims, Rescue Centres for animals involved so that the victim can be treated/ rehabilitated immediately.

Arrangements with veterinary services for quick movement for tranquilising, first aid treatments etc in potential areas. Every newly posted vet in the areas to be trained in these trades in Wildlife Institute of India.

Stock of usually needed equipment and drugs either in forest offices or veterinary centres for cutting on response time.

Awareness

Mobilizing volunteers like "Vanya Praani Mitra" programme of Gujarat Forest Department for interacting with puhlic, interface with forest department and preliminary steps for mobilizing local help in case of emergencies. Local volunteers should also be trained to interact with people, handle the incidences of HWC according to the SoPs for reporting to appropriate contacts and organise locals on immediate initial steps, till the Wildlife rescue team arrives.

Information campaign on conservation friendly practices, ciiltivation of suitable species which do not attract wildlife of the area, steps to be taken when one comes across any wildlife, and encouraging human activities which may detet wildlife in proximity to human habitations. Regular meetings of field functionaries in localities on the status and difficulties related to HWC. Signages in the identified localities for occurrence, precautions and suggested actions in case of encounter with wild animals.

Forest management actions

Clearing vistas along the boundaries of forests in close proximity of the habitations for avoiding chance encounters. Identifying regular movement corridors of large wild life and adequate publicity for avoiding disturbance in such areas. Upkeep of' status of wildlife in the potential conflict areas, especially migration/ movement pattern. Maintaining information and data of HWC cases and also the developments in the area which may have bearing on HWC. This may include agricultural practices, NTFP collection. cultural religious or practices inside forests etc. Arrangements for deployment of personnel and quick action on cognizance on receipt of reports of conf!ict cases. Appropriate rules and procedure to be made for speedy and objective assessment of damage and providing relief. Sufficient delegation at field level for deciding and disbursing the ex-gratia amount, for its effective use for a[illegible] possible trauma due to HWC. Regular monitoring and review by Chief Wild Life Warden of the situation in all potentially conflict areas.

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Researches

Use of local data in spatial patterns - at Division/ range level with GIS based system.

Radio telemetry for identification and pattern of movement of large wildlife in case of threat to humans. Compilation of animal behaviour in case of species likely to be involved in HWC for strategy for management. Compilation of comparable cases of conflict, reasons thereof and best practices for helping response decisions and for information of' public.

For Herbivore conflict Maintaining foraging ground within the forest along boundaries, free of lantana and weeds, and by augmenting palatable grasses and other forage species. Helping locals in maintaining barriers and scaring away by possible non-destructive methods. In extreme cases, removal of identified animals/ groups responsible for habitual crop raidlng, preferably by capture and relocation and in rarest of rare cases, elimination. In ease of species like elephants, maintain traditional migratory routes under forest cover or perennial tree crops to minimize damage. Payment of ecosystem services principles can be an option in identified areas. for encoufaging land owners of such areas for adopting desirable land use practices in community interest. Insurance for damage to life or property due to HWC States may consider insurance programmes for damage due to wild life. For this purpose dialogue with insurance sector may provide ways to pursue this option for management ot' situations arising out of human wildlife conflict. Insurance can be considered for damage to standing crops besides that to life/injuries to human being. Modalities may vary for such programme from place to place based on assessment of risk by the Insurance companies. Feasibility may be explored at the state level. The actions indicated above can be organised into a time-bound plan based on priority and need of locations.

A register has to be maintained in the following format at division level:

Format 1: Animal attack on Human being / Live stock

Dateof Incident	Place of Incident (inside forest or outside)	Wild Animal species involved	Damage caused by wild animal	Brief description of the incident	Details of compensation

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Role of Stakeholders

Primary stakeholders are the policy makers, legislatures, MoEF&CC (Wildlife section), Forest department, apart from this the wildlife lawyers and NGOs are the other interested stakeholders.

- NHAI/State Highways Authority: There should be special rules and provision included in Highway manual and the authority which maintains and manages the national highways in consonance with the
- National Highway Act,1956 to prevent such accidents. Also, mitigation measures for linear infrastructure should be followed.
- Agriculture and horticulture department :Work out modalities and strategy to mitigate and reduce conflict, type of crops grown and insurance to offset loss to the farmer. The Revenue Code should have a chapter on such exigencies
- Role of Police:The Police manual should have instructions how to manage conflict situation and their specific roles
- District Disaster Management Authority: DDMA Manual shouldincorporate HWC mitigation measures and ensure capacity building ofits team to ensure that they provide assistance to the DFO/Wildlifemanager in the event of HWC.
- Veterinary Department: The veterinarian should be aware of theprovisions in Indian Veterinary Council Act (1984) and IndianVeterinary Council Rules (1985), in respect of capture/ tranquilizationand treatment of elephants/s.

Addressing Drivers & Pressure

Degradation, fragmentation & loss of habitat

• Dev activities near forest and growing human population & settlements

• Heavy human dependence on forest, most attacks take place when people are inside forest for fuel, fodder, livelihood or daily activities

• Declining prey base in the forest for carnivores

• Changes in the feeding habits of the animals

• Depletion of forage, water and other critical requirements

• Population beyond carrying capacity

• Most of the orchards and agriculture fields been which were acting as buffer areas between forest land and human settlements have been developed into residential areas

• Linear infrastructure Project (Road, Railway line, canal etc.)

• Lack of livelihood opportunity for local communities

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Compensation

Compensation is meant to provide relief to people and to win their support and sympathy for wild animals and forest staff.

1. Inadequate and delayed payment of compensation cause dissension among public.

2. Concept of compensation has changed public perception of wild animals from 'nature's creation' to 'Their (Forest Department's) animals'.

3. Too much emphasis on compensation in wildlife management.

4. Misuse of compensation.

• Alternatives to Cash Compensation:

1. Relief in the form of food-grains & building-material

2. Subsidy for growing alternative crops and alternative livelihoods

3. Support for setting up wildlife-proof barriers

4. Reward by enhanced allocation for eco-development

5. Insurance of human-life and crops

6. Categorizing wildlife-depredation as 'Natural Calamity' and providing relief to the victims through district administration

Management of conflict

Conflict can be minimized by a combination of strategies:

Animal oriented strategies:

A. Immediate Measures: Measures to drive away the animal from the problem spot.

B. Long Term Measures: Creating conducive habitat for the animals

C. Special Measures: Measures based on understanding the nature and limitations of the target animals and exploiting the same.

D. Dealing with Problem Animals:

Identify and remove a problem animal when it becomes a liability

A. Immediate Measures

- Quick Response Teams (RRT & PRT)
- Distribution of crackers, kerosene, search-lights, etc. to villagers
- Crop-guarding posts (Machans)

Managing human-beings

Human-management strategies should aim at:

- Increasing tolerance of human-beings for wild animals

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- Reducing competition between wild animals and human-beings for resources (space, food and water).
- Minimizing interface (Contact) between wild animals and human-beings.
- Encouraging 'wildlife-compatible' lifestyles.

6.2 Monitoring performance

Why monitor?

The term 'monitoring' has been used to describe many types of activities. It can be defined as the process of gathering information about variables such as rate of loss of forest cover or quantity of wildlife poached per month within a system of interest, such as a protected area. Monitoring information is used to characterize the status of the protected area at different points in time for the purpose of assessing the state and drawing inferences about changes in state over time.

Monitoring is critical to determine trends in biological diversity over space and time with an emphasis on evaluating the effectiveness of management actions and policies.

Scientific and Management Objectives for Monitoring

Such objectives can be usefully categorized into two general classes – scientific and management objectives.

Scientific objectives:

Scientific objectives focus entirely on learning and developing an understanding of the behavior and dynamics of the monitored system. There are a number of approaches that are used to address scientific objectives from monitoring data

Management objectives:

On the other hand, monitoring programs designed to aid management objectives provide information that is useful in making informed decisions about the management of protected areas. The content of this module will focus on this category of monitoring.

Overall, monitoring must be guided by scientific principles in order to provide information that is statistically defensible and useful for managers responsible for managing biodiversity.

(a)The role of monitoring in the project management cycle

In relation to the project management cycle, monitoring is defined as the periodic collection and evaluation of data relative to stated project goals, objectives and activities. Many refer to this process as Monitoring and Evaluation, which can be abbreviated as "M&E". It is anessential part of good conservation management and a key component of the ProjectManagement Cycle.

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A conceptual model provides the scientific basis for developing monitoring plans and is viewed as the foundation of all project design, management, and monitoring activities. These models define hypotheses about linkages between changes in the state of biodiversity components, threats and management actions or interventions.

A conceptual model explicitly identifies the components of biodiversity that need to be conserved (Conservation targets), what human and natural factors threaten these targets (direct threats), the roles that resource users, managers and policy makers play that lead to or facilitate the direct threats (indirect threats) and the interventions that will be implemented in order to reduce threats.

Overall, there are at least three reasons why monitoring is important:

i. Monitoring allows us to assess the status of threats and conservation targets. In particular, we need to understand whether threats are decreasing or increasing and whether wildlife populations are increasing, remaining stable or declining.

ii. Evaluating the effectiveness of management interventions. Monitoring helps us identify which actions lead to the success or failure of a particular conservation approach and evaluate and revise assumptions as to why and where conservation efforts are needed.

Thus, monitoring plays a key role in the process known as adaptive management- which is a dynamicprocess that involves the integration of monitoring results back into project design and implementation.

(b) Monitoring provides information for decision-making

Monitoring is only relevant when it provides information for decision-making. Monitoring that does not provide relevant information for decision-making is not useful for management and is inefficient because it uses human and fiscal resources that could bedirected elsewhere. Thus monitoring is useful only if it leads to improved management decisions and therefore, a key component of any monitoring plan is a mechanism to use the new information to guide management decisions.

2. What to monitor?

Decisions about which variables to monitor are determined largely by the objectives of the monitoring programs: Monitoring programmers designed to inform management shouldfocus on the state and other variables that are included in the management objectives as wellas on variables that are needed to model the managed state variables adequately.

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a. Levels of Monitoring

To show that interventions are reducing threats to conservation targets, we need to monitorat all three levels across the causal chain: conservation targets, threats and interventions.

i. Measuring conservation targets (impact monitoring)

This involves tracking changes in the status of conservation targets.

ii. Measuring changes in the levels of threats (outcome monitoring)

This involves measuring changes in the status of threats to conservation targets.

iii. Measuring the implementation of interventions (performance monitoring)

This involves monitoring a planned intervention.

(b) Setting priorities and allocating resources for monitoring

Given that time, financial resources and personnel/staff are limited for almost allconservation projects, managers must achieve a balance between taking conservation action(implementing interventions), evaluating the effectiveness of interventions and monitoringthe status of conservation targets and threats. It is often a struggle to make decisionsregarding the allocation of limited resources among these competing needs.

Time-scale issues and Tradeoffs

As conservation of wildlife and their habitats is our objective, then we need to monitor their changing status over time. Even in the absence of human pressures, there is natural variation in wildlife populations and habitat quality over time that makes it very difficult to detect changes solely attributable to the interventions that have been implemented in the project.

Measuring change in biological conservation targets is often a long-term effort. However, given the assumed causal connection between the conservation targets, specific threats and the interventions designed to abate the threats, monitoring threats (outcome monitoring) and interventions (performance monitoring) allows us to measure conservation progress over the short to medium term. However, there

are trade-offs that we must be aware of when we decide to use outcome and performance measures as estimates of progress towards achieving our objective of conserving our conservation targets. The timeframe needed to see results and the costs of monitoring decline as we move from monitoring changes in conservation targets to monitoring reduction in threats to monitoring the implementation of interventions.

However, short and medium-term measures are compromised in their ability to inform us on the true extent to which our conservation objective is being achieved. This [illegible] level of confidence with which we can say that we are achieving success declines as we move from short to medium-term measures

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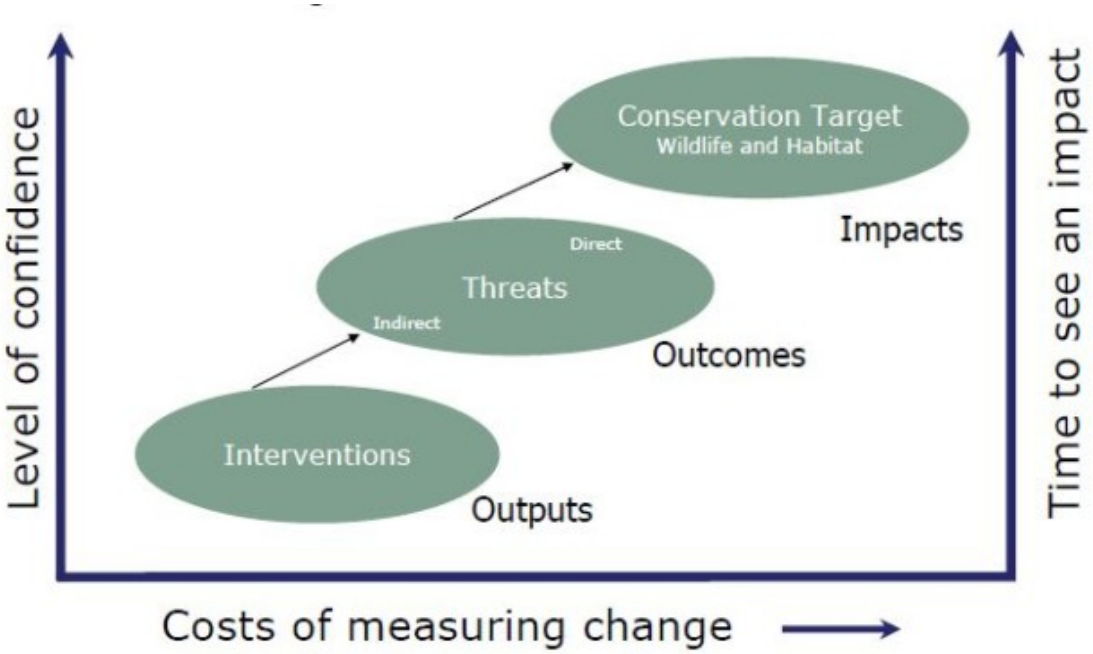

Tradeoffs in costs, time and level of confidence when monitoring project interventions, threats to wildlife and habitats, and the project conservation objective.

Given that it is impossible to monitor every intervention, threat and conservation target at the same intensity or level of precision, it becomes important to set priorities while allocating resources for monitoring. Decisions can be taken based on the following questions

(i) Which monitoring information does the project require to fulfill either donor or institutional requirements? This should be top priority for allocation of monitoring resources

(ii) What level of precision is needed to ensure that the monitoring results can be effectively used to influence management decisions?

(iii)What information would be useful to have but would need additional funding?

There will be trade-offs in cost, precision and confidence associated with different monitoring methods.

There are two key decisions that conservation practitioners need to take in project implementation.

(1) How should managers allocate resources between implementing interventions and monitoring the impact of the interventions and,

(2) How should managers subdivide monitoring resources across different levels of monitoring and types of monitoring indicators?

In general the following guidelines are provided to help determine investment in monitoring

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(iv)· Monitoring results should explicitly guide management decisions about a project.

(v)· To be sustainable, monitoring methods need to be kept as simple and low-cost as possible

(vi)· A higher investment in monitoring is needed if (a) the cost of the intervention is high (b) the threat to the biological target is extremely severe and could result in irreversible change (for example extinction).

(vii)· There are large gaps in our knowledge

If monitoring a target or threat is very expensive or difficult, it is useful to 'triangulate' usingeasy to monitor proxy variables.

Developing a monitoring framework

A monitoring framework is an outline of steps that will be taken to monitor the effectiveness of interventions in reducing threats to conservation targets.

The monitoring framework is tightly linked to the conceptual model of CR.

(a) Defining clear goals and monitoring objectives for targets, threats and interventions

For every element of the conceptual model (conservation target, threats and interventions), you need to identify the following:

1. A quantitative objective that will be achieved within a given time-frame

2. For conservation targets, a monitoring objective will describe the status (increase, decrease or maintain at same level) of the wildlife species or habitat that will be attained over a fixed time-period.

3. For threats, a monitoring objective will specify by how much the threat will be reduced over a certain time-period.

4. For conservation interventions, a monitoring objective will relate to whether a planned intervention was implemented over a certain time period.

In general, a monitoring objective needs to be:

Impact oriented, representing a change in desired condition or state.

Measurable, against a baseline or along a standard scale.

Time-bound, achievable within a specific period of time.

(b) Establishing indicators and appropriate monitoring methods

An indicator is a variable or parameter that will be measured over time in order todetermine if the project is making progress towards the quantitative objective. There couldbe one or more indicators for every monitoring objective. Indicators should have thefollowing characteristics. They should be:

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(a) Measurable in either qualitative or quantitative terms. Qualitative data is descriptive such as narratives from interviews with villages and quantitative is numerical measures (i.e., abundance or density).

(b) Precisely defined.

(c) Consistent over time. If an indicator is expected to provide a reliable measurement of change in a factor, then it is important that observed effects be due to changes in the actual condition, not to changes in the indicator. (This criterion generally applies to proxy indicators as opposed to indicators that measure something directly). Proxy indicators are used as a substitute for an indicator that cannot be directly measured or assessed.

(d) Sensitive. A sensitive indicator will change proportionately and in the same direction as changes in the condition or item being measured.

Criteria for good design, implementation and management of a monitoring program

I. Why monitor?

(1) Identify flexible goals and clear objectives for monitoring

(a) Ensure objectives are responsive to management needs

(b) Ensure objectives are developed in a participatory manner with the relevant stakeholders

(c) Clearly state the time frame for the monitoring program and the time expected to see results

II. What should be monitored?

(1) Identify the variable(s) to be measured and ensure they meet the following criteria:

(a) Relevant to management

(b) Scientifically defensible and biologically representative

(c) Statistically powerful and interpretable

(d) Measurable and feasible

(e) Easily understood

(2) Identify your target population

(a) Define the scale at which you need to monitor and the scale at which you will infer your results

III. How to monitor?

(1) Develop formal collaborations with statisticians and scientists in developing monitoring protocols

(2) Develop monitoring methods and data collection protocols

(a) Address sampling bias in selection of sites to be monitored

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(b) Address detection error in sampling design

(c) Ensure minimum sample sizes and sampling effort required to achieve objectives

(d) Ensure adequate precision of estimates to permit detection of change over time

(3) Solicit feedback and review of monitoring protocols from experts

(4) Assess and evaluate if the methods are the most cost-effective to address your monitoring objectives

IV. Other important considerations for management and implementation

(1) Identify the person/persons responsible for implementation

(a) Ensure adequate personnel, skills and training are available for implementation and data analysis

(2) Secure adequate funding for the duration of the monitoring program, including design, implementation, analysis and communication of information

(3) Ensure an information management system is in place for managing and communicating monitoring data

(4) Ensure that monitoring objectives, methods, key assumptions and data recording protocols are carefully documented and accessible by all stakeholders

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Office Deputy Conservator of Forest Jhunjhunu

Shakambhary Conservation Reserve Item wise & Year wise phasing of Physical & Financial targets (Area 5030 ha.)

Villages Rampura, Lohargal, Chirana, Kirodi, Kot, Bagora, Pahadila etc.

S.No	Activity	unit	Rate (in Lakhs)	Total targets		Year wise Physical & Financial targets																											
				Phy.	Fin.	2018-19		2025-26		2026-27		2027-28		2028-29		2029-30		2030-31		2031-32		2031-33		2031-34		2032-33			2033-34		2034-35	
						Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	(A) Fencing																																
1	Construction of Pucca boundary wall	Km.	33.50	20	670.00	0.00	0.00	10	335.00	10	335.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Raising of 2 ft wall on existing 4 ft wall	Km.	10.00	1	10.00			1	10.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Construction of Chainlink Fencing	Km.	20.00	6	120.00			3	60.00	3	60.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Maintenance of Chainlink Fencing	Km.	0.50	6	3.00			3	1.50	3	1.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
5	construction of boundary pillars	No.	0.03	30	0.90			30	0.90	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
	(B) Plantation Work																																
1	Silvipastoral Plantation & maintenance	ha	0.77	200	154.80	0.00	0.00	100	77.40	50	38.70	50	38.70	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	ANR plantation and maintenance	ha	0.67	200	133.80			50	33.45	50	33.45	50	33.45	50	33.45	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Enrichment of old RDF Plation	ha	0.38	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Closure for Bio diverscity conservation	Ha.	0.54	100	40.82			50	27.21	25	13.61	25	13.61	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–

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6	Vrakshkunj 5 ha.	5 ha	15.60	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
7	Sowing of neem, chhila/Shok etc seeds in thor/other throny bushes 1.85 per bushe	No.	0.000022	14	25.90			2	3.70	2	3.70	2	3.70	2	3.70	2	3.70	2	3.70	2	3.70	3.70	3.70	3.70	3.70	3.70	–	–	–	–	–	–
8	Grasses	LS	0.00259	0	8.00			0	2.00	0	2.00	0	2.00	0	2.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
8	Construction of New Nursery	LS	20.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
9	Plantation along Road Side	No.	0.06	1500	90.00			500	30.00	500	30.00	500	30.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
	(C) Infrastucture Development																															
1	Construction of forest Chowki & Residence	No.	8.50	2	17.00			1	8.50	1	8.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Construction of forest Naka & Residence	No.	15.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Construction of Watch tower	No.	10.00	1	10.00			1	10.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Construction of Small Watch Tower/view points for forest protection and maintenance	No.	2.00	6	12.00			6	12.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
5	Construction of Barriers / Checkpost	No.	5.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
6	Solar System	No.	10.00	2	20.00			2	20.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
7	Building Maintenance old & New	LS	LS	6	12.00			0	0.00	2	4.00	2	4.00	0	0.00	2	0.00	0	0.00	0	0.00	1.00	2.00	3.00	4.00	5.00	–	–	–	–	–	–

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8	Old Structure & forest Renovation for protection use as Watch tower	No.	1.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
	(D) Eco Tourism																																
1	Construction of Gate	No.	10.00	1	10.00			1	10.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Construction of Interpretation Center for awareness	No.	130.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Construction of Cafetaria /refreshment	No.	15.00	1	15.00			1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Construction of Eco Trail	No.	1.00	30	30.00			10	10.00	10	10.00	10	10.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Construction Jhompa/Benches	No.	1.50	4	6.00			2	3.00	2	3.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
5	Construction of Biotoilets	No.	2.50	2	5.00			1	2.50	1	2.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
6	Maintenance of Inspection path & Eco Trail	LS	LS	LS	14.00			0	1.00	0	1.00	0	1.00	0	2.00	0	3.00	0	3.00	0	3.00	3.00	3.00	3.00	3.00	3.00	–	–	–	–	–	–
7	Maintenance of view point/ Watch Towar	LS	LS	LS	15.00			0	0.00	0	1.00	0	2.00	0	3.00	0	3.00	0	3.00	0	3.00	3.00	3.00	3.00	3.00	3.00	–	–	–	–	–	–
8	Sinages (Prachar & parsar)	No.	0.60	5	3.00			5	3.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
	(E) Soil & Moisture/Water Conservation																																

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1	Construction of Anicut Type	No.	8.50	8	68.00			1	8.50	1	8.50	2	17.00	2	17.00	2	17.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Construction of MPT	No.	2.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Construction of PT	No.	3.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Construction of WHS	No.	4.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
5	Construction of Nadi/Talai/Gailar	No.	6.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
6	Construction Gabion Structre	No.	0.80	40	32.00			20	16.00	20	16.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
7	Construction of Loosoe Stone Checkdams	Cum	0.003	40000	120.00			20000	60.00	20000	60.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
8	Renovation of old water bodies	No.	5.00	7	14.00			2	4.00	2	4.00	3	6.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
	(F) Wildlife Habitat Improvement																															
1	Removal of *Prosopis juliflora* and allien Species Rate 0.20 per Ha. Market Price	ha	0.20	200	40.00			100	20.00	100	20.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Conversion of *Prosopis juliflora* bushes into tree wood lots	ha	0.999	350	349.65			100	99.90	150	149.85	100	99.90	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Construction of Rescue Centre for Wildfife	LS	10.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Wildlife Hospital	LS	35.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
5	Purchase of Rescue Items	LS	LS	LS	2.50			0	0.00	0	2.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1.00	2.00	3.00	4.00	5.00	–	–	–	–	–	–
6	Solar Pump	No.	10.00	2	20.00			1	10.00	1	10.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–

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8	Purchase of Tranquilazatio n Gun with accessories	LS	7.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
9	Mounds for nesting of birds	No.	15.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
10	Fire line creation	Km.	0.10	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
11	Maintenance of fire line	Km.	0.03	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
12	Fire Fighting equipment	LS	LS	LS	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1.00	2.00	3.00	4.00	5.00	–	–	–	–	–	–
	(G) Extension Activities																															
1	Purchase of Camera & Binocular	No.	1.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Wireless System	No.	2.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Purchase of Projecter	No.	2.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Purchase of CCTV Camera	No.	2.00	8	13.50			3	4.50	3	4.50	2	4.50	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
5	Purchase of Computers	No.	0.75	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
6	Purchase of Photocopy Machine & etc.	No.	1.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
7	Training Programes	LS	LS	LS	3.50			0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0.50	0.50	0.50	0.50	0.50	–	–	–	–	–	–
8	Staff Training	LS	LS	LS	3.50			0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0.50	0.50	0.50	0.50	0.50	–	–	–	–	–	–
9	EDC training	LS	LS	LS	3.50			0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0.50	0.50	0.50	0.50	0.50	–	–	–	–	–	–
10	Local People training	LS	LS	LS	0.50			0	0.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
11	Seminar	LS	LS	LS	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
12	Prizes	LS	LS	LS	1.40			0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0.20	0.20	0.20	0.20	0.20	–	–	–	–	–	–
13	Prepation of brousers, Map, Pumlets, IT equipment, book let, management plans etc.	LS	LS	LS	2.00			0	1.00	0	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
	(H) Other																															

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1	Purchases of Bolero Camper	No.	12.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
2	Purchases of Motercycle	No.	1.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
3	Purchases of Rescue Ambulance	No.	15.00	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	–	–	–	–	–	–
4	Maintenance of Vehicle	LS	LS	LS	14.00			0	2.00	0	2.00	0	2.00	0	2.00	0	2.00	0	2.00	0	2.00	2.00	2.00	2.00	2.00	2.00	–	–	–	–	–	–
5	Other Expenses	LS	LS	LS	7.00			0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00	–	–	–	–	–	–
	Total				**2180.77**	**0.00**	**0.00**	**21008**	**922.26**	**20939**	**854.51**	**748**	**287.56**	**54**	**65.85**	**6**	**35.40**	**2**	**14.40**	**2**	**14.40**	**17.40**	**20.40**	**23.40**	**26.40**	**29.40**	**0**	**0**	**0**	**0**	**0**	**0**

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Office of the deputy conservator of forest Sikar

Shakambhari Conservation Reserve Proposed work's physical & financial target under Management plan for 10 years 2025-26 to 2034-35

Sr. no.	Activity	Total				Year wise physical & financial target																	
		Unit	Rate	Total		2025-26		2026-27		2027-28		2028-29		2029-30		2030-31		2031-32		2032-32		2033-34		2034-35	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
A	**Wildlife management & conservation**																								
(A.I)	**Construction of Pre base augmentation enclosures**																								
1	Construction of enclosure	No.	1000000	**2**	**20**	1	10	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Construction of rescue centre/ first aid facility room for wild animal with store room	No.	1500000	**2**	**30**	1	15	0	0	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0
B	**Habitat development**			**0**	**0**																				
(B.I)	**Grassland restoration**			**0**	**0**																				
3	Removal of invasive species for grassland restoration	ha.	44750	**500**	**223.75**	100	44.75	50	22.375	50	22.38	50	22.38	50	22.38	40	17.9	40	17.9	40	17.9	40	18	40	17.9
4	Development of grassland by sowing of seed, planting of sapling	ha.	71492	**500**	**357.36**	200	69.88	100	67.472	50	63.59	50	47.11	50	40.46	50	36.77		18.25		10.13		2.7		1.03
5	Digging of V ditch for soil conservation	r.m.	31.05	**27500**	**8.53875**	5000	1.553	2500	0.77625	2500	0.776	2500	0.776	2500	0.776	2500	0.776	2500	0.776	2500	0.776	2500	0.8	2500	0.78
6	Contour furrow	r.m.	4.61	**27500**	**1.26775**	5000	0.231	2500	0.11525	2500	0.115	2500	0.115	2500	0.115	2500	0.115	2500	0.115	2500	0.115	2500	0.1	2500	0.12
7	Digging of trenches for soil conservation	r.m.	48.2	**40000**	**19.28**	10000	4.82	5000	2.41	5000	2.41	5000	2.41	2500	1.205	2500	1.205	2500	1.205	2500	1.205	2500	1.2	2500	1.21
(B.II)	**Invasive species management**			**0**	**0**																				
8	Removal of prosopis juliflora & other invasive species to promote native biodiversity	ha.	44750	**500**	**223.75**	100	44.75	100	44.75	100	44.75	50	22.38	25	11.19	25	11.19	25	11.19	25	11.19	25	11	25	11.2
(B.III)	**Protective infrastructure**			**0**	**0**																				
9	Construction of boundary wall 6 feet height	km	4700000	**52**	**2444**	10	470	10	470	5	235	5	235	5	235	5	235	5	235	5	235	2	94	0	0
10	Repair of boundary wall old/new	kM	2000000	**6**	**120**	1	20	1	20	0.5	10	0.5	10	0.5	10	0.5	10	0.5	10	0.5	10	0.5	10	0.5	10
11	Construction of chainling fencing	KM	1017000	**20**	**203.4**	4	40.68	4	40.68	2	20.34	2	20.34	2	20.34	2	20.34	2	20.34	1	10.17	0.5	5.1	0.5	5.09

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Sr. no.	Activity	Total				Year wise physical & financial target																	
		Unit	Rate	Total		2025-26		2026-27		2027-28		2028-29		2029-30		2030-31		2031-32		2032-32		2033-34		2034-35	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
12	Repair of chainling fencing	km	250000	**5**	**12.5**	0	0	0	0	0	0	0	0	0	0	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5
(B.IV)	**Plantation works**			**0**	**0**																				
13	ANR plantation & maintenance	ha.	82000	**200**	**164.001**	50	29.85	50	36.2687	50	38.56	50	39.78	0	11.15	0	4.732	0	2.436	0	1.218	0	0	0	0
14	Shelter belt plantation 10 hect.	ha.	150000	**200**	**363.57**	100	69.72	100	125.267	0	90.77	0	43.07	0	11.71	0	7.71	0	7.71	0	5.74	0	1.9		0
15	Shelter belt plantation 25 hect.	ha.	108000	**400**	**646.88**	200	100	200	211.106	0	180.8	0	85.43	0	23.41	0	15.42		15.42		11.48		3.8		0
16	Closure for biodiversity conservation	ha.	60000	**500**	**298.65**	100	47.17	200	103.701	100	69.1	100	62.92	0	12.57	0	3.194	0	0	0	0	0	0	0	0
17	Vrakshkunj 1 ha.	ha.	1000000	**5**	**50**	0	0	5	22.5	0	6.5	0	6	0	5	0	5	0	5	0	0	0	0	0	0
18	Vrakshkunj 5 ha.	ha.	1000000	**5**	**50**	0	0	5	22.5	0	6.5	0	6	0	5	0	5	0	5	0	0	0	0	0	0
19	Plantation along with protection /tourism path	per tree	3000	**1000**	**29**	0	0	0	0	1000	15	0	5	0	2	0	2	0	2	0	2	0	1	0	0
20	Sowing of different varieties tree species seeds	per notc he	1.87	**160000**	**2.992**	25000	0.468	25000	0.4675	25000	0.468	25000	0.468	10000	0.187	10000	0.187	10000	0.187	10000	0.187	10000	0.2	10000	0.19
21	Sowing of different varieties grass seeds near water bodies	No.	3.5	**200000**	**7**	0	0	100000	3.5	100000	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Strengthening of nurseries	No.	2500000	**2**	**50**	1	25	1	15	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(B.V)	**Water management for wild animals**			**0**	**0**																				
23	Construction of borewells with accessories with solar Pannel	No.	1000000	**15**	**150**	4	40	2	20	2	20	1	10	1	10	1	10	1	10	1	10	1	10	1	10
24	Laying of pipeline	km	275000	**34**	**93.5**	10	27.5	5	13.75	5	13.75	2	5.5	2	5.5	2	5.5	2	5.5	2	5.5	2	5.5	2	5.5
25	Construction of water point	No.	100000	**30**	**30**	6	6	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2
(B.VI)	**Soil & moisture conservation works**			**0**	**0**																				
26	Construction of MPT	No.	200000	**20**	**40**	2	4	6	12	6	12	4	8	2	4	1	2	1	2	1	2	0	0	0	0
27	Construction of PT	No.	300000	**10**	**30**	2	6	4	12	2	6	1	3	0	0	0	0	0	0	0	0	0	0	0	0
28	Construction of WHS	No.	350000	**10**	**35**	0	0	4	14	2	7	1	3.5	1	3.5	1	3.5	1	3.5	0	0	0	0	0	0
29	Construction of	No.	700000	**5**	**35**	0	0	3	21	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Sr. no.	Activity	Total				Year wise physical & financial target																	
		Unit	Rate	Total		2025-26		2026-27		2027-28		2028-29		2029-30		2030-31		2031-32		2032-32		2033-34		2034-35	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
30	Creation of fire lines	km	26520	**400**	**106.08**	40	10.61	40	10.608	40	10.61	40	10.61	40	10.61	40	10.61	40	10.61	40	10.61	40	11	40	10.6
31	Fire fighting equipment's	s.m.	LS	**0**	**7**		1		1		1		1		1		1		1						
C	**Infrastructure & capacity building**			**0**	**0**																				
(C.I)	**Facility for forest staff**			**0**	**0**																				
32	Construction of range office cum residence	No.	1500000	**1**	**15**	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	Construction of forester Naka	No.	1200000	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	Construction of guard chowki	No.	1000000	**4**	**40**	2	20	1	10	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	Construction of patrolling camp	No.	400000	**4**	**16**	0	0	1	4	1	4	1	4	1	4	0	0	0	0	0	0	0	0	0	0
36	Construction of observation tower/ watch tower	No.	250000	**10**	**25**	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5
37	Construction of barriers & check posts	No.	200000	**10**	**20**	2	4	2	4	2	4	2	4	1	2	1	2	0	0	0	0	0	0	0	0
38	Maintenance of buildings	LS	200000	**16**	**32**	2	4	2	4	2	4	2	4	1	2	2	4	1	2	1	2	2	4	1	2
39	Solar panels (Installation of solar panels at all offices)	LS	400000	**17**	**68**	4	16	4	16	2	8	1	4	1	4	1	4	1	4	1	4	1	4	1	4
40	Wireless communication infrastructure development	LS	LS	**0**	**24**	0	4	0	4		2		2		2	0	2	0	2	0	2	0	2	0	2
41	Providing camera, GPS, computer, laptop etc. monitoring equipment's	LS	LS	**0**	**24**	0	4		4		2		2		2	0	2	0	2	0	2	0	2	0	2
42	Providing patrolling vehicle	No.	1000000	**2**	**20**	1	10	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(C.II)	**Facility for animal health monitoring**			**0**	**0**																				
43	Providing rescue kit for staff	LS	LS	**0**	**8**	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
44	Providing camera trap	No.	20000	**50**	**10**	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	Providing trap cage	No.	50000	**7**	**3.5**	2	1	2	1	1	0.5	1	0.5	1	0.5	0	0	0	0	0	0	0	0	0	0
46	Providing tranquilizer gun	No.	500000	**2**	**10**	0	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0

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Sr. no.	Activity	Total				Year wise physical & financial target																	
		Unit	Rate	Total		2025-26		2026-27		2027-28		2028-29		2029-30		2030-31		2031-32		2032-32		2033-34		2034-35	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
47	Providing required medicine for wild animals	Ls	LS	0	4	0	0	0	1	0	1	0	0.5	0	0.5	0	0.5	0	0.5	0	0	0	0	0	0
48	Providing rescue vehicle	No.	1200000	2	24	1	12	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	Maintenance & running of vehicles	LS	LS	0	32	0	2	0	2	0	2	0	2	0	4	0	4	0	4	0	4	0	4	0	4
(C.III)	**Restoration of historical infrastructure**			0	0																				
50	Restoration of old stepwells & other water harvesting structures	No.	800000	5	40	1	8	1	8	1	8	1	8	1	8	0	0	0	0	0	0	0	0	0	0
D	**Tourism development**			0	0																				
(D.I)	**Tourism routes and circuits**			0	0																				
51	Construction of new tourism routes/patrolling routes and circuits	km	150000	52	78	20	30	10	15	10	15	5	7.5	5	7.5	2	3	0	0	0	0	0	0	0	0
52	Repair of existing patrolling routes	LS	LS	200	100	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10
53	Construction of echo friendly pathways	km	20000	18	3.6	6	1.2	6	1.2	4	0.8	2	0.4	0	0	0	0	0	0	0	0	0	0	0	0
(D.II)	**Tourism amenities**			0	0																				
54	Construction of echo lodges	No.	200000	4	8	0	0	0	0	1	2	1	2	1	2	1	2	0	0	0	0	0	0	0	0
55	Construction of interpretation centre	No.	2500000	1	25	0	0	0	0	0	0	1	25	0	0	0	0	0	0	0	0	0	0	0	0
56	Construction of main entry gate	No.	1000000	2	20	1	10	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	Construction of other entry gate	No.	100000	6	6	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
58	Construction of ticket window	No.	200000	1	2	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	Construction of facilities & waiting area	No.	300000	2	6	0	0	0	0	1	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
60	Signages	LS	LS	0	24		5		5		2		2		2	0	1	0	1	0	1	0	1	0	1
61	Construction of cafeteria	No.	400000	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	Construction of jhonpa	No.	750000	10	75	4	30	2	15	1	7.5	1	7.5	1	7.5	1	7.5	0	0	0	0	0	0	0	0
63	Providing benches	LS	LS	0	5		1		1		1		1		1	0	0	0	0	0	0	0	0	0	0
64	Creating view point	No.	100000	8	8	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0

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Sr. no.	Activity	Total				Year wise physical & financial target																	
		Unit	Rate	Total		2025-26		2026-27		2027-28		2028-29		2029-30		2030-31		2031-32		2032-32		2033-34		2034-35	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
66	Providing support for creation & running of self help groups	LS	LS	0	5	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	1
67	Entry point activities	LS	LS	0	42		2		8		4		4		4		4		4		4		4		4
68	Man - wild animal conflict / Compensation & Ex Grecia	LS	LS	0	11	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1		1	0	2
(E.II)	**Awareness programs**			0	0																				
69	Conduct campaigns to educate local communities	LS	LS	0	5.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	1
70	Educational tour in PA for students & local people	LS	LS	0	5.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	1
71	Different educational activities for students for awareness	LS	LS	0	5.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	1
72	Training of forest staff etc members & local people	LS	LS	0	5.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	1
73	Seminars for awareness & educational purpose	LS	LS	0	5.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	1
74	Providing projector	LS	LS	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	Providing CCTV cameras	LS	LS	0	10	0	2	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0
76	Preparation of brochure, map, pamphlets, IT equipment's, booklets management plan exp. Etc.	LS	LS	0	5	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	Other misc. expenses	LS	LS	0	44	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	8
	Total			0	6785.12	0	1283	0	1516.45	0	1018	0	794.2	0	527.1	0	477.6	0	431.1	0	389.7	0	222	0	126
	Escalation in rates in future 10% per year			0	665.953		0		128.318		151.6		104.8		79.42		52.71		47.76		43.11		39		22.2
	Grand total				7451.07	0	1283	0	1644.76	0			896	0	606.5	0	530.4	0	478.9	0	432.8	0	261	0	148

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Annexure-1

LIST OF FLORA

I. वृक्ष / Trees

S. No.	Scientific name	Local name	Family
1	Acacia leucophloea	रोंझा अरौंझ	Mimosaceae
2	Acacia nilotica	बबूल	Mimosaceae
3	Acacia senegal	कुमठा	Mimosaceae
4	Acacia tortilis	इजराइलीबबूल	Mimosaceae
5	Aegle marmelos	बेल	Rutaceae
6	Ailanthus excels	अरडू	Simarubaceae
7	Albizia procera	सफेदसिरस	Mimosaceae
8	Azadirachta indica	नीम	Meliaceae
9	Bauhinia racemosa	झीझा	Caesalpiniaceae
10	Cassia fistula	अमलतासकरमेला	Caesalpiniaceae
11	Cassia siamea	केसियास्यामा	Caesalpiniaceae
12	Citrus medica	नींबू	Rutaceae
13	Cordia dichotoma	गून्दा, लसौड़ा	Ehretiaceae
14	Dalbergia sissoo	शीशम	Fabaceae
15	Delonix regia	गुलमोहर	Caesalpiniaceae
16	Ficus bengalensis	बड़, बरगद	Moraceae
17	Ficus glumerata	गूलर	Moraceae
18	Ficus religiosa	पीपल	Moraceae
19	Holoptelea integrifolia	चूरैल/पापड़ी	Ulmaceae
20	Mangifera indica	टाम	Anacardiaceae
21	Melia azedarach	बकायन/बकान	Meliaceae
22	Morus alba	शहतूत	Moraceae
23	Moringa conconensis	सैंजना	Moringa
24	Mytensusemarginatus	ककेड़ा	

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25	Phoenix sylvestris	खजूर	Arecaceae
26	Emblica officinalis	आंवला	Euphorbiaceae
27	Inga dulce	जंगल जलेबी	Mimosaceae
28	Pongamia pinnata	करंज/ कणज	Fabaceae
29	Prosopis cineraria	खेजड़ी /जांटी	Mimosaceae
30	Salvadora oleoides	पीलू, खाराजाल	Salvadoraceae
31	Syzygiumcuminni	जामुन	Myrtaceae
32	Tamarindus indica	इमली	Caesalpiniaceae
33	Tecomella undulata	रोहिड़ा	Bignoniaceae
34	Ziziphus xylopyrus	घटबोर	Rhamnaceae
35	Annona squamosa	सीताफल	Annonaceae
36	Balanites aegyptiaca	हिंगोट	Simaroubaceae
37	Capparis decidua	कैर, करील	Capparaceae
38	Commiphora wightii	गूगल	Burseraceae
39	Prosopis juliflora	विलायतीबबूल	Mimosaceae
40	Parkinsonia aculeate	पार्किनसोनिया	Caespiniaceae
41	LeptadeniaPyrotechnica	खींप	Asclepiadaceae
42	Nerium Oleander	कनेरलाल	Apocynaceae
43	Ocimum gratissimum	वनतुलसी	Lamiaceae
	II. Shurbs&Herbs		
1	Sida cordifolia	खरैंटी	
2	Tephrosia purpurea	धमासा	Combretaceae
3	Ziziphus mauritiana	बड़ाबौर, बौर	Rhamnaceae
4	Ziziphus numularia	झाड़ीबेर	Rhamnaceae
5	Ziziphus numularia	झाड़ीबेर	Rhamnaceae
6	Aerva javanica	बुई	Amaranthace
7	Agave americana	रामबांस	Agavaceae

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8	Aloe vera	गवांरपाठा/ धृतकुमारी	Liliaceae
9	Argemone mexicana	सत्यनासी	Papaveraceae
10	Barleria cristata	बज्रदन्ती (नीली)	Acanthaceae
11	Barleriaprionitis	बज्रदन्ती (पीली)	Acanthaceae
12	Bouganvilaspp	बेगनविला	
13	Parthenium hysterophorus	गाजर घास	Asteraceae
14	Tephrosia purpurea	झोझरु, सरपंखा	Fabaceae
15	Withaniasomnifera	असगन्ध /अश्वगंधा	Solanaceae
16	Daruramatel	धतूरा	Solanaceae
17	Dodonea viscose	रेलिया	Sapindaceae
18	Echinopsechinatus	उंटकटेली	Asteraceae
19	Euphorbia chamaesyce	दूधी	Euphorbiaceae
20	Euphorbia granulata	दूधेली	Euphorbiaceae
21	Euphorbia granulata	दूधेली	Euphorbiaceae
22	Crotalaria burhia	सिणिया	Fabaceae
23	LeptadeniaPyrotechnica	खींप	Asclepiadaceae
24	Nerium Oleander	कनेरलाल	Apocynaceae
25	Ocimum gratissimum	वनतुलसी	Lamiaceae
26	Calotropis gigantea	आंकड़ासफेद	Asclepiadaceae
27	Calotropis procera	आंकड़ामदार	Asclepiadaceae
IV. Climbers and lianas			
1	Cuscuta hylina	अमरबेल	Cuscutaceae
2	Cuscuta reflexa	अमरबेल	Cuscutaceae
3	Citrullus colocynthis	तूंबा/ गड़ तूंबा	
4	Monordia dioica	ककोड़ा	

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5	**Tinospora cordifolia**	नीमगिलोय	**Menispermaceae**
6	**Vallaris solanaceae**	दूधीबेल	**Apocynaceae**
7	**Asparagus racemosus**	शतावरी	
8	**Abrus precatorius**	रत्तीबेल, चिरमी	**Fabaceae**
9	**Cryptostegia grandiflora**	दूधी, रवड़ बेल	**Periplocaceae**
V. Grasses			
1	**Saccharum spontaneum**	कांस	**Poaceae**
2	**Aristida adscensionis**	लंपला	**Poaceae**
3	**Besmostachyabipinnata**	डाब	**Poaceae**
4	**Cenchrus biflorus**	भरभूट	**Poaceae**
5	**Cenchrus setigerus Vahl**	धामण	**Poaceae**
6	**Cymbopogon fovecolatus**	मोथा	**Poaceae**
7	**Cynodondactylon**	छूब	**Poaceae**
8	**Dichanthiumannulatum**	करड़	**Poaceae**
9	**Imperata cylindrica**		
10	**Saccharum munja**	मूंज	**Poaceae**

Annexure II

LIST OF FAUNA

1. स्तनधारीवर्ग / Mammals

S.no.	स्थानीय नाम	**Common name**	**वैज्ञानिकनाम / Scientific name**
1	बन्दर	**Rhesus macaque Monkey**	**MecacaMultta**
2	बघेरा, तेंदुआ	**Beghera/Leopard/ Panther**	**Panthera pardus (Linn)**
3	लंगूर	**Common Langur, Hanuman Monkey**	**Presbyti[illegible]**

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4	जंगलीबिल्ली	Jungle Cat	Felis chaus
5	नेवला	Common Mongoose	Herpestesedwerdsi
6	सियार/गिदड़	Jackal	Canis aureus
7	लोमड़ी	Red Fox	Vulpes vulpes
8	जरख	Striped Hyaena	Hyaena hyaena
9	बिज्जू	Common Palm Civet	Paradoxarus hermaphrodites
10	नीलगाय	Blue Bull	Boselaphustragocamelus
11	झाउ चूहा	Hedge hog	Hemiecanus auritus
12	सांभर	Sambhar	Cervus unicolor
13	गिलहरी	Palm Squirrel	Funambulus pennant
14	चूहा	Common House Rat	Rattus rattus
15	सेही/सेवली	Indian porcupine	Hystrix indica
16	खरगोशरेगिस्तानी	Desert Hare	Lepus nigricollis dyanus
17	खरगोश	Indian Hare	Lepus nigricollis trufi
18	छछुन्दर	Grey Musk Shrew	Suncus Murinus
19	चमगादड़	Bat	Megaderma lyra
20	रेगिस्तानीबिल्ली	Desert cat	Felis libyea
21	बघेरा	Panthera pardus	Felidae
ष्ष पक्षीवर्ग ६ ।अपनिदं			
1	सुर्खाब	Brahminy duck	Tadornaferruginea
2	नक्टा	Comb duck	Sarkidiornis melanotos.
3	गुरल	Grey duck	Anas poecilorhyncha.
4	छिपक, चपक	Indian Nightjar	Caprimulgus asiaticus
5	लघुवलयितटिटहरी	Little ringed plower	Charadrius Bubius.
6	पिहूया	Pheasant tailed Jacana.	Hydrop[illegible]irurgu s

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7	टिहरी	River Tern	Sterna aurantia.
8	टंजन	Grey Heron	Ardea cinerea
9	कोकरई	Night Heron	Nycticorexnycticorax
10	बगूला	Pond Heron	Ardeolagrayii.
11	बगूला	Little egret	Egretta garzetta.
12	सुर्खियाबगला	Cattle Egret	Bubulcus ibis
13	कांचबगला	Little Green. Bittern.	Butorides striatus
14	लगलग	White Ibis.	Tjhreskiormis
15	बाज, कालाबाज	Black Ibis	Pseudibispapillosa
16	चमचबाज	Spoon bill	Platalealeucoredia
17	छोटाकिलकिला	Small blue kingfisher	Alcedo atthis
18	किलकिला	White-breasted Kingfisher	Haleyonsmyrnensis
19	लघुहरितपतरिंगा	Small Green Beeeater.	Merops orientalis.
20	बड़ापतरिंगा	Blue tailed Beeeater	Merops philippinus
21	नीलकण्ड	Indian Roller or Blue Jay	Coracias benghalensis
22	हुदहुद	Hoope	Upupa epops
23	भटतीतर	Common Sandgrouse	Pteroclesexustus
24	पहाड़ीभटतीतर	Painted Sand grouse	Pterocles Indicus
25	हरियल	Common Green. Pigeon	Treron Phoenicoptera
26	कबूतर	Blue Rock Pigeon	Columba livia.
27	फाखता	Red turtle Dove.	StreptopeliaTraquebaric a
28	चित्रक, फाखता	Spotted Dove	Streptopelia Chinensis
29	पारकी, पण्डूक	Ring Dove.	Streptopelia Decaocto
30	छोटीफाखता	Little Brown Dove.	Streptopelia senegalensis
31	पपीहा	Brain fever Bird.	Cuculusvar

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32	कोयल, कोकिल	Koel	Eudynamysscolopacen
33	महोक	Crow pheasant	Centropus sinensis
34	लगगर	Laggar-Falcon	Falco biarmicus Jugger Gray
35	मोर, मयूर	Common Pea fowl.	Pavo cristatus
36	लालवनकुटकुट	Red Junglefowl	Gallus gallus
37	जंगलीमुरगी	Grey jungle fowl	Gallus sonneratii
38	कालातीतर	Black partridge	Francolinusfrancolinus
39	सफेदतीतर	Grey partridge	Francolinuspondicerianus
40	बटेर	Common Quail	Coturnix coturnix
41	चानक, चाइनाबटेर	Rain Quail	Coturnix coromandelica
42	क्षुपबटेट	Bush Quail	Perdicula asiatica
43	जल कुककुटी	White breasted Waterhen	Amaurornisphoenicurus
44	जलमुर्गी	Indian Moorhen	Gallinula chloropus
45	सारस	Sarus crane	Grus antigone
46	भरतपक्षी	Small Indian Skylark	Alauda gulgula
47	चन्दुल	Crested Lark	Galerida cristata
48	जंगलीअगिया	Redwinged Bush Lak	Mirafra erythro-ptera
49	अबाबील	Common Swallow	Hirundo rustica
50	सफेदलटेरा	Grey Shrike	Lanius excubitor
51	छोटालटेरा	Baybacked shrike	Lanius vittatus
52	जंगलीकसया	Cuckoo shrike	Coracinamelanoptese
53	पीलक	Golden Oriole	Oriolus oriolus
54	कृष्ण शीशपीलक	Black headed Oriole	Oriolus xanthor
55	पहाड़ीभुजंग	WhitebelliedDrongo	Dicrurus caerulescens

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56	भीमराजभुजंग	Racket tailed Drongo	Dicrurusparadiseus
57	तिल्वर	Rosy pastor	Sturnus roseus.
58	घूसट शीर्षमैना	Grey headed Myna	Stuirnus malabaricus
59	बामनीमैना	Brahminy Myna	Sturnus pagodaru;m
60	देशीमैना	Common Myna	Acridotheres tristis
61	गंगामैना	Bank Myna	Acridotheres ginginianus
62	जंगलीमैना	Jungle Myna	Acridotheres Fuscus
63	देशीकौवा	House crow	Corvus splendens
64	जंगलीकौवा	Jungle crow	Corvus macrorhynchos
65	तरुपिक	Tree Pie	DendrocittaVagabunda
66	बुलबुल	Red vented Bulbul	Pycnonotus cafer
67	भोहोंवालीबुलबुल	White checked Bulbul	Pycononotusluteolus
68	जर्दबुलबुल	Black Headed Yellow Bulbul	Pycononotusmeanicterus
69	सतभाई	Jungle Babbler	Turdoides striatus
70	डूमरी, चिलचिल	Common Babbler	Turdeides caudatus
71	शाहबुलबुल	Paradise Fly-catcher	Terpsiphone paradise
72	जंगलीचिड़ी	Yellow throated sparrow	Petronia xanthocollis
73	गौरेया	House sparrow	Passer domesticus
74	बया	Black breasted weaver bird	Ploceus benghalensis
75	बया	Common weaver bird	Ploceus philippinus
76	मुनिया	Green munia	Estrildaformosa
77	चरचरा, सरमुनिया	throated munia	Lonchura Malacca
78	पनडुब्बी	Snake-bird	Anhinga melanogaster
79	कठफौड़वा	Pied wood-packer	Picoidesmahrattensis

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80	कठ फौड़वा	**Glodenbacked wood pecker**	**Dinopiumbenghalense**
81	हीरामनतोता	**Large Indian Parakeet**	**Psittaculaeupatria**
82	लाइबरतोता	**Roseringed Parakeet**	**Psittaculakrameri**
83	तुइयातोता	**Blossomheaded Parakeet**	**Psittaculacyanocephala**
84	घुग्धु	**Indian Great Horned owl**	**Bubo bubo**
85	बिदुंकितउलूकक	**Spotted owlet**	**Athene brama**

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III. सरीसृप / Reptiles

S.no.	LFkkuh; uke	Common name	वैज्ञानिकनाम / Scientific name
1	dNqvkikuh dk	Indian sawbaok	Kachnga tecta
2	dNqvkrkykc dk	Indian mud turtle	Lissemys punctata
3	dNqvkHkwfe dk	Starred tortoise	Geochelone elegans
4	fNidyh	Northern house geeko	Hemidactylus flaviviridis
5	fNidyh	Fat tailed gecko	Eublepharismacularivl
6	fxjfxV	Common garden lizard	Calotes versicolor
7	gkyfu;ka	Indian chameleon	Chamaeleon zeylanicaul
8	xsg	Common indian monitor	Varanus beagalansis
9	Nqeqgh	Johr's earth boa	Eryx johnii
10	/kke.k	Common rat snake	Ptyasmucosus
11	djk;r	Common indian krait	Bungarus caeruleus
12	ux	Indian cobra	Naja naja
13	fpRrh	Russell's viper	Vipera rapelli
14	lkaMk	Spiny tailed lizard	Uromastixhardwikii
15	fiVokbZij	Pitviper	Ancistrodonhimalayahus

IV. उभयचारीवर्ग / Amphibians

S.no.	LFkkuh; uke	Common name	वैज्ञानिकनाम / Scientific name
1	lkekU; esa<d	Common Indian Toad.	Bufo melanostictus
2	esa<d] MsVdk	Marbled Toad	Bufo stomaticus
3	eSank] MsVdk	Indian Bull Frog	Rana tigerina
4	eSank] MsVdk	Burrowing Frog	Rana tomopte

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Notification

	राजस्थान राज-पत्र विशेषांक	RAJASTHAN GAZETTE Extraordinary
सत्यमेव जयते	साधिकार प्रकाशित	*Published by Authority*
	फाल्गुन 4, गुरुवार, शाके 1933–फरवरी 23, 2012	*Phalguna 4, Thursday, Saka 1933 – February 23, 2012*

भाग 1 (ख)
महत्वपूर्ण सरकारी आज्ञायें।

वन विभाग
अधिसूचना
जयपुर, फरवरी 9, 2012

संख्या प.3(16)वन/2009 :– वन्य जीव सुरक्षा अधिनियम, 1972 (1972 का केन्द्रीय अधिनियम संख्या 53), जो कि भारत सरकार, कृषि मंत्रालय (कृषि विभाग) की अधिसूचना संख्या एफ 11014/3/72–एफ.आर.वाई./डब्ल्यू.एल.एफ. दिनांक 01 सितम्बर, 1973 से राजस्थान राज्य पर लागू किया जा चुका है, की धारा 36 ए की शक्तियों का प्रयोग करते हुए एवं स्थानीय समुदायों एवं संबंधित ग्राम पंचायत से परामर्श के पश्चात् राज्य सरकार वन खण्ड रघुनाथगढ, जो राज्य सरकार की अधिसूचना पत्रांक एफ 1(6) (19) राज–8/73 दिनांक 21–06–73 द्वारा राजस्थान वन अधिनियम, 1953 के अधीन रक्षित वन घोषित किया जा चुका है, की सम्पूर्ण रक्षित वन भूमि जिसकी सीमाएं निम्न अनुसूची में वर्णित है, को परिस्थितिकीय व प्राणीजातिय, वनस्पतीय भू–संरचना संबंधित नैसर्गिक एवं प्राणी शास्त्रीय महत्व को ध्यान में रखते हुए एतद्द्वारा "कन्जरवेशन रिजर्व" घोषित करती है । इसे भविष्य में "शाकम्भरी कन्जरवेशन रिजर्व" के नाम से जाना जावेगा एवं जो उक्त अधिनियम या तद्धीन बनाए गए नियमों या जारी किए गए आदेशों के उपबन्धों का विषय होगा । शाकम्भरी कन्जरवेशन रिजर्व का कुल क्षेत्रफल 13100 हैक्टर है जिसमें से 8070 हैक्टर क्षेत्र सीकर जिले में तथा 5030 हैक्टर क्षेत्र झुंझुनूं जिले में अवस्थित है ।

अनुसूची

उत्तरी सीमा	:–	रक्षित वनखण्ड रघुनाथगढ की उत्तरी सीमा
दक्षिणी सीमा	:–	रक्षित वनखण्ड रघुनाथगढ की दक्षिणी सीमा
पूर्वी सीमा	:–	रक्षित वनखण्ड रघुनाथगढ की पूर्वी सीमा
पश्चिमी सीमा	:–	रक्षित वनखण्ड रघुनाथगढ की पश्चिमी सीमा

राज्यपाल की आज्ञा से,
सी.एस. रत्नासामी,
शासन सचिव,
वन विभाग,
शासन सचिवालय, जयपुर।

707
राज्य केन्द्रीय मुद्रणालय,जयपुर

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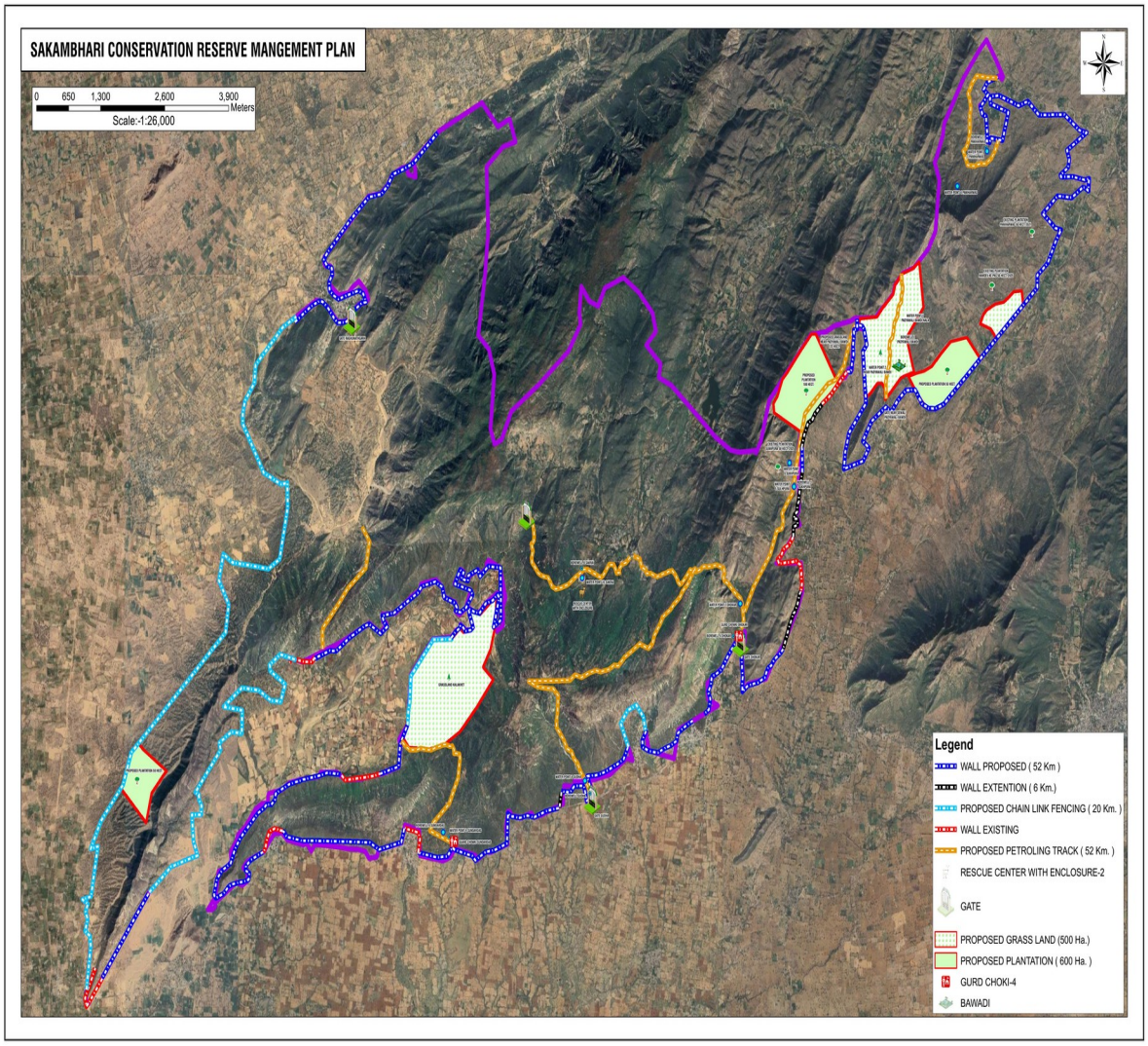

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