

CHAPTER-III

Territorial integrity of the Sanctuaries, ESZ and Wildlife Corridors

A Snapshot

Issuance of final notification under Section 26A of the WPA for substantial area falling under Balaram Ambaji and Jessore Sanctuaries was still pending. There were deficiencies in the demarcation of Sanctuaries, demarcation records were not maintained properly and inspections were not adequate for avoiding encroachment of Sanctuary areas. Despite the provisions of the Forests Rights Act (FRA), which stipulates that no fresh land could be brought under use (including cultivation) after 2005, fresh areas were being cleared for cultivation.

Lack of proper planning, coordination, and follow-up with the neighbouring State Authorities regarding mutual consultations on ESZ, resulted in 'zero km' ESZ in Balaram Ambaji, Ratanmahal and Shoolpaneshwar Sanctuaries while ESZ on interstate border remained inadequate in Jessore Sanctuary. In the absence of a systematic approach for timely preparation of Zonal Master Plan (ZMP), the ZMPs in respect of the five Sanctuaries remained incomplete even after lapse of 12 months to 94 months since the stipulated dates of their formation. As such, the notification of ESZ did not serve the purpose of regulating development activities inside the respective ESZ.

The Department neither conducted any study itself to identify the precise corridors nor took cognizance of the findings of the scientific study conducted by ISRO for recognizing, protecting, and developing these wildlife corridors. The identified corridors were not included fully in the notified ESZ of Balaram Ambaji and Jessore Sanctuaries. There was need of dedicated plan for proper management of already identified corridors.

Introduction

Protected Areas (PAs) are well defined geographical spaces, recognized, dedicated, and managed through legal and other effective means to achieve the long-term conservation of nature. Eco-Sensitive Zones (ESZs) are areas notified by the MoEFCC around the National Parks and Wildlife Sanctuaries. The purpose of declaring ESZ is to create a 'Shock Absorber'/'transition zone' for the PAs by regulating and managing the activities around such protected areas. They would also act as a transition zone from areas of high protection to areas involving lesser protection. As per NWAP, Eco Sensitive Zone status under the Environment (Protection) Act, 1986, should be used as a tool to strengthen the buffers and corridors around the PA.

Wildlife habitats are becoming increasingly fragmented due to anthropogenic activities. Corridors help to reduce or moderate some of the adverse effects of

habitat fragmentation by facilitating dispersal of wildlife between habitats allowing for both long-term genetic interchange and to re-colonize habitat patches from where wildlife have become locally extinct.

The issues regarding final notification of Sanctuaries and ESZs, maintenance of territorial integrity of Sanctuaries and the formulation of Zonal Master Plans for regulation of development in ESZ have been discussed in the subsequent paragraphs.

3.1 Legal status of Jessore and Balaram Ambaji Sanctuary and settlement of rights and privileges

Clearly defined boundaries and legal status of the PAs would help in effective protection of the wildlife. This in turn would ensure long term conservation and reduce conflicts with local communities and thereby help PA managers in effective discharge of their protection and conservation functions.

As per Section 26A of the Wildlife (Protection) Act, 1972 (WPA) (as amended in 1991), the State Government is empowered to declare an area as ‘Sanctuary’ after completion of procedure as contained in Sections 18 to 25 of the Act. Further, Section 66(4) of the Act provides that where any proceedings under Sections 19 to 25 are pending on the date of commencement of amendment Act (1991), any Reserve Forest or part of territorial waters declared under Section 18 shall be deemed to be Sanctuary. Thus, issuance of Notification under Section 26A of the WPA is essential to give legal status to areas other than Reserve Forest and territorial waters as a Sanctuary.

Audit observed that all the six test-checked Sanctuaries had been notified under Section 18 of the WPA prior to 1991. It was further observed that four out of the six test-checked Sanctuaries¹ comprised fully of Reserved Forests. However, Jessore and Balaram Ambaji Sanctuaries comprised of land other than the reserve forest as shown in table below:

Table 3.1: Land composition of Jessore and Balaram Ambaji Sanctuaries as on September 2021

S. No.	Name of the Sanctuary	Year of notification of Sanctuary	Total Area of the Sanctuary (in Ha)	Area of Reserve Forest (in Ha)	Percentage of reserve forest w.r.t. total area of Sanctuary
1	Jessore	1978	18,066.29	3,669.71	20.31
2	Balaram Ambaji	1989	54,478.39	20,964.57	38.48

Source: Information provided by the Department.

Hence, as per provisions mentioned above, except the reserve forest notified as Sanctuary prior to 1991, which comprised only 20.31 and 38.48 *per cent* of the Jessore and Balaram Ambaji Sanctuaries respectively; the remaining area of these two Sanctuaries cannot be deemed as Sanctuary as per Section 66(4) of the WPA. Audit observed that even in the Management Plans of the two

¹ Jambughoda, Ratanmahal, Shoolpaneshwar and Purna Sanctuaries.

Sanctuaries for the period 2021-22 to 2030-31 it is mentioned that though this area has been declared as PA, settlement process under WPA was still awaited. Thus, the final notification under Section 26A of the WPA was still pending and 79.69 and 61.52 *per cent* of the area respectively falling under these two Sanctuaries still lacked legal status (November 2022).

PCCF (WL) replied (March 2021) that there were 18 enclaved villages in Jessore and 86 enclaved villages in Balaram Ambaji and Collector, Banaskantha has been appointed (March 1993) as the Settlement Officer. However, rights and privileges had not yet been settled in any of these enclaved villages.

Audit noticed that the Settlement Officer had submitted his report on rights and privileges in May 2000, however, the F&ED was yet to approve the report (October 2022). The Department did not furnish any reasons for not approving the report of the Settlement Officer even after passage of more than 22 years since its submission.

Thus, due to non-issuing of final notification under Section 26A of the WPA, these two Sanctuaries lacked legal status which was detrimental to the conservation and management activities of wildlife and its habitat. This was established from the fact that the Hon'ble Gujarat High Court in its decision (June 2014) did not acknowledge the part of Balaram Ambaji Sanctuary outside the reserve forest as Sanctuary, for want of compliance to the provisions of Section 19 to 25 of the WPA. Consequently, the High Court refused to put restrictions on mining within one km of the boundary of the Sanctuary².

The Department stated (November 2022) that the proposal for final notification, as per the applicable Guidelines and instructions, would be sent to the Government.

Recommendation 4: The Department may complete the process of settlement and final notification for Balaram Ambaji and Jessore Sanctuaries in a time-bound manner.

3.2 Difference in notified area *vis-à-vis* area as per study report

The notification of the Protected Area and the Eco Sensitive Zones around it specifies the details of the villages/ taluka/ District included in such PA/ ESZ and also its total geographical coverage area.

An analysis of the Land Use Land Cover³ *vis-à-vis* notifications for Sanctuary/ ESZ, revealed that the GIS based area of the Sanctuary and its ESZ (calculated at the instance of Audit by Space Application Centre (SAC) Ahmedabad) was less than the notified areas in respect of three out of the six test-checked

² except the area located within one km of the boundary of reserve forest (part of the Sanctuary), deemed to be a Sanctuary declared under Section 26A within the meaning of Section 66(4) of the WPA.

³The LULC analysis involved analysis of satellite imageries and field verifications. The ESZ boundary layers were obtained from the Forest Department. Suitable datasets from Landsat satellites (*The Landsat Program is a series of Earth-observing satellite missions jointly managed by National Aeronautics and Space Administration (NASA) and the United States Geological Survey. Landsat satellites track land use and document land change due to natural and human-caused changes*) were selected for decadal time frames i.e. 1980, 2000 and 2020. The datasets were downloaded from various repositories using Google Earth Engine (GEE). Area statistics were computed and field visits were performed to remove the ambiguities and to ascertain the purity of classes of land use/ cover. Collateral datasets (Forest Survey of India maps and vegetation type maps) were also referred to resolve the categorization issues of the classes.

Sanctuaries. The difference ranged between seven to 19 *per cent*, as detailed in the following table:

Table 3.2: Notified area *vis-à-vis* area arrived at during the Land Use and Land Cover analysis
(Area in Sq. Km.)

Name of the Sanctuary	Notified ESZ Area	Notified area of Sanctuary	Total notified area	Area as per Land Use and Land Cover study report (Sanctuary and ESZ)	Difference (in <i>per cent</i>)
Ratanmahal	241.5	55.65	297.15	241.31	(-) 18.79
Jambughoda	269.69	130.38	400.07	355.98	(-) 11.02
Shoolpaneshwar	545.20	607.70	1,152.91	1,069.57	(-) 7.23

Source: Notifications in respect of Sanctuary and ESZ and SAC study report.

Thus, the actual area available for wildlife was less as compared to the notified area. This may lead to conflict between locals and the Department due to difference of perception regarding extent of Sanctuary/ ESZ, which might adversely affect the planning and implementation efforts for protection, conservation and management of the respective Sanctuary/ ESZ. The Department is required to reconcile the difference in area actually available for better management of the Sanctuary/ ESZ.

The Department stated (November 2022) that matter has been reported to the Government.

3.3 Alteration in Sanctuary area/ map of wildlife Sanctuary

Section 20 of the Indian Forest Act (IFA), 1927 empowers the State Government to notify an area as a Reserved Forest (RF). However, any RF may cease to be so, by notification of the State Government under Section 27 after getting prior approval of the Central Government. Further, the WPA empowers the State Government to notify an area as a Sanctuary. However, the power to alter the boundary of a Sanctuary has been expressly reserved with the National Board of Wildlife (NBWL).

- In exercise of powers conferred under Section 20 of the IFA, GoG declared (1965/ 1969) 6,048.87 Ha area of 11 villages of Limkheda Taluka of Panchmahal district as RF. Subsequently, out of this, the State Government declared (April 1982) 5,565.13 Ha, as Ratanmahal Wildlife Sanctuary under Section 18 of the WPA.

Audit observed that an area of 122.08 Ha of RF was being shown as deleted from notified RF in village form⁴ number 1 maintained by the jurisdictional division. However, notification of area ceasing to be RF was issued in 1996 for only 89.46 Ha. On being requested (August 2021), the Department could not furnish any notification regarding exclusion of remaining area of 32.62 Ha from RF. Thus, 32.62 Ha was being shown as deleted from the notified RF in village form number 1 without requisite notification under

⁴ Division maintains a village form no. 1, which reflects the village wise area declared as forest and details of area ceased to be forest, if any.

FCA. Moreover, the above area of 122.08 Ha was also excluded from the map of the Sanctuary, without prior approval of the NBWL. As such, this area was not being protected and conserved in terms of FCA and WPA.

The Department stated (November 2022) that area of 30.50 Ha has been given to the Irrigation Department while 2.12 Ha has been given to villagers under FRA (for cultivation purpose).

The reply of the Department confirmed that reserve forest area and map of the Sanctuary were altered without approval of the competent authority.

- Audit also observed that forest area of 518.93 Ha of three villages⁵ which were part of Shoolpaneshwar Sanctuary, was shown as non-Sanctuary area in the Map forming part of the final ESZ notification of the Sanctuary.

Since the field staff of the Department rely on map of the Sanctuary for their day-to-day functions, discrepancies in the map may impact conservation efforts.

The Department stated (November 2022) that the matter had been reported to the State Government.

3.4 Boundary Demarcation and Digitisation of Sanctuaries

In the absence of a clear boundary demarcation, the field staff of forest division finds it difficult to protect the forest/ Sanctuary land from encroachment. This may result in conflicts with local population and pose a threat to the wildlife habitats due to encroachment. Encroachment in the peripheral forests can be avoided by proper survey, demarcation, erection of boundary cairns and stone/ rubble wall fencing on the boundary.

Out of six test-checked Sanctuaries, five Sanctuaries (except Purna Sanctuary) are highly fragmented, which makes them vulnerable to encroachment in the absence of proper demarcation on ground. The Management Plans of these Sanctuaries acknowledge improper demarcation on ground, poor maintenance of boundary register, lack of settlement of rights and privileges of locals, encroachment, and consequent need for proper demarcation on ground as well as on map and its periodical checking.

Audit observed that instruction issued (July 2016) by the PCCF (WL) regarding checking/ ascertaining the exact forest boundaries (which has changed due to several reasons including implementation of FRA), recording of GPS coordinates and its annual reporting to appropriate authorities was not being adhered to. As such, the boundaries of the Sanctuaries were not being monitored to ensure their inviolability in order to avoid conflict with local populace. Demarcation registers were either not being maintained properly or were not updated on regular basis. Further, the Department had not developed any GIS based decision support database even after lapse of 10 years since

⁵ Babadokti (203.49 Ha), Govalpatadi (154.38 Ha) and Ambagam (161.06 Ha).

pronouncement (July 2011) of guidelines in this regard by the Hon'ble Supreme Court of India.

The details of deficiencies observed by Audit in the demarcation, maintenance of records and lack of periodical inspections have been mentioned in **Appendix II**.

Absence of proper demarcation, digitisation and periodical monitoring of the boundaries makes the Sanctuaries susceptible to encroachment.

During the exit conference (October 2022) the Department informed that separate boundary demarcation registers have been maintained for forest and Sanctuary area. The Department also assured that jurisdictional DCFs would henceforth comply with the instructions issued regarding demarcation and inspection of boundary.

The Department also stated (November 2022) that digitisation of boundaries had been initiated in respect of three Sanctuaries namely Shoolpaneshwar, Purna and Jambughoda and assured to update the demarcation register in respect of Purna Sanctuary.

3.5 Rights of persons *vis-à-vis* conservation of wildlife and its habitats

3.5.1 Survey and demarcation around areas where cultivation rights have been recognised

The Scheduled Tribes (STs) and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA) provides for certain rights to forest dwellers which secure individual or community tenure or both on fulfillment of certain prescribed conditions. The individual or community rights are determined by following a due procedure which includes passing of resolution by the Gram Sabha and filing of petition before Sub-divisional level and District level committees, in case of any grievances. Further, the FRA stipulates that recognition of rights was subject to the condition that the forest land has been occupied prior to 13th December 2005 *i.e.* no fresh land could be brought under use (including cultivation) after 2005.

Audit observed that the management plans of the test-checked Sanctuaries (except for Shoolpaneshwar) did not have prescriptions regarding survey and construction of pillars around the areas where cultivation rights are recognized under the FRA. Further, no mechanism was established in any of the test-checked Sanctuaries for ground proofing of the area where rights were given for cultivation under FRA.

3.5.1.1 Cultivation inside the Sanctuary area

The SAC in its Land Use and Land Cover (LULC) analysis⁶ brought out the increasing trend in agriculture and decreasing trend in moderate dense forest,

⁶ conducted for the six test-checked Sanctuaries and its surrounding areas for the period 1980-2020.

open forest and degraded forest in Ratanmahal and Purna Sanctuaries. The LULC analysis concluded that there was increase in agriculture areas (ranging from 28 to 33 *per cent*) during 1980 to 2020. Similar trend in respect of agriculture/ moderate dense forest/ open forest were observed in Shoolpaneshwar except for the increase in degraded forest. The maps showing trend of increasing agriculture in Shoolpaneshwar Sanctuary are shown in **Appendix III**.

Audit conducted joint site visit of the Sanctuaries with jurisdictional Range Forest Officers/ Foresters. During the site visit, cultivation was observed (September 2021) in Sagai, Fulsar and Gora Ranges of Shoolpaneshwar Sanctuary and Bardipada Range of Purna Sanctuary. However, it was observed that there was no demarcation/ signage/ rubble wall/ boundary cairns erected between the area where the cultivation rights were given to villagers *vis-à-vis* the Sanctuary area, which could function as a deterrence to encroachment or unauthorised cultivation. The requirement of such demarcation was also highlighted by PCCF (WL) in the instructions issued in July 2016 to prevent encroachment and ascertain the ground position of the sanctuary area.

It was further observed that in Purna Sanctuary, along the Kalibel-Mahal road, fresh area was being cleared. Trees/ tree branches had been cut and were being used for creating boundaries and huts under construction.

This was in violation of FRA and thus, highlighted the need to properly maintain the boundary pillars in the Sanctuary.



Photograph 3.1: Fresh area cleared for cultivation in the Purna Sanctuary along the Kalibel-Mahal road (photograph taken on 21 September 2021)

The Department stated (November 2022) that cultivation observed in Sagai and Fulsar range was being done by the holders of Certificate under FRA. In case of Purna Sanctuary it was informed that out of 239 claims settled under FRA, demarcation had been done in respect of 198 claims.

The reply of the Department is not convincing because LULC analysis as well as joint site visit established that fresh areas were being brought under cultivation even in the recent years, which was in violation of FRA. The reply regarding Purna Sanctuary confirmed the audit contention regarding non-demarcation of area under FRA *vis-à-vis* Sanctuary area.

Recommendation 5: The Department may ensure proper demarcation of the boundaries of the Sanctuaries by constructing boundary pillars especially in areas where rights have been settled under the FRA.

3.6 Eco-Sensitive Zones (ESZ)

Eco-Sensitive Zones (ESZ) are declared by the MoEF&CC based on the proposal of the State Forest Department. The basic aim of creation of the ESZ is to create a kind of "shock absorber" by regulation of certain activities around National Parks and Wildlife Sanctuary so as to minimise the negative impacts of such activities on the fragile ecosystem encompassing the Protected Area. They also act as a transition zone from areas of high protection to areas involving lesser protection and also important for the animals moving out to other forests.

Declaration of ESZ is mandatory as per the decision taken (March 2005) by NBWL and order dated 4 December 2006 of the Supreme Court of India (SCI). The SCI re-established (June 2022) that each National Park or Wildlife Sanctuary must have an ESZ of minimum one kilometre measured from the demarcated boundary of such Protected Area.

The MoEF issued Guidelines for declaration of ESZ in February 2011 and asked the States to submit proposal for ESZ around Sanctuaries. Subsequently, MoEF decided (July 2013) that in respect of PAs where proposal for ESZ has not been submitted, a default area of 10 Km from the boundary of the PA would be deemed as ESZ, till ESZ is finally notified. Further, delineation of ESZ was supposed to be site specific and the activities in the ESZ were supposed to be of a regulatory nature rather than prohibitive nature. In case where sensitive corridors, connectivity, and ecologically important patches crucial for landscape linkage, are even beyond 10 Km width, these could be included in ESZ.

3.6.1 Preparation of inventory of different land use patterns

As per the ESZ Guidelines, the ESZ should be proposed by the State Government based on the inventory of different land use patterns, different types of activities and number of industries operating around each PA as well as important wildlife corridors.

Audit observed (between March and September 2021) that none of the four divisions, having jurisdiction over the six test-checked Sanctuaries, had prepared the inventory of the land use patterns, activities, and operative industries around the respective Sanctuary. In the absence of such inventory, the activities within the notified ESZ area could not be regulated. Moreover, some of the important corridors were not fully included in the ESZ as discussed in paragraph 3.9.

The Department confirmed (November 2022) that inventory of the land use patterns was not prepared in any of the six Sanctuaries.

3.7 Mutual consultations with neighbouring States regarding formation of ESZ

The purpose of declaration of ESZ is regulation of human activities around the PA. For these the human activities are categorised into prohibited, regulated and permitted. As per Guidelines of February 2011, for declaration of ESZ around

National Parks and Wildlife Sanctuaries in cases where the boundary of a PA abuts the boundary of another State where it does not form part of any PA, it shall be the endeavour of both the States to have mutual consultations and decide upon the ESZ around the PA in question.

Out of six test checked Sanctuaries, four Sanctuaries share boundaries with other States, as shown below:

Table 3.3: Details of inter-State boundaries of the Sanctuaries

Sl. No.	Name of the Sanctuary	Neighbouring State	Perimeter of the Sanctuary (Km)	Perimeter of the Sanctuary forming boundary with the other State (Km)
1	Balaram Ambaji	Rajasthan	703	21.50
2	Jessore	Rajasthan	222	31
3	Ratanmahal	Madhya Pradesh	64.83	21.21
4	Shoolpaneshwar	Maharashtra	269.95	43.50

Source: Information furnished by the Department.

MoEF&CC notified ESZs around the above four Sanctuaries between 2016 and 2021 on the basis of proposals made by the State Government. Audit observed that nothing was on record to establish that the neighbouring State authorities were consulted (except for Jessore⁷) before submission of proposals to the MoEF&CC for declaration of ESZ. Audit further observed that the proposals submitted to the MoEF&CC by the Department did not include ESZ at interstate boundaries. This resulted in '0' km ESZ at the interstate boundaries of above mentioned Sanctuaries.

The absence of ESZ on interstate boundaries defeated the very purpose of formation of ESZ to act as a shock absorber and to regulate certain activities around the PA, as such activities were not regulated on the other side of interstate boundary. Therefore, the objective of minimizing the negative impacts of activities, identified as prohibited and regulated in the Guidelines, on the fragile ecosystem could not be fully achieved.

The Department stated (November 2022) that in respect of Shoolpaneshwar Sanctuary coordination was made at district level whereas in respect of Jessore and Balaram Ambaji Sanctuaries the revenue areas of Rajasthan touches these two Sanctuaries and consultation with the neighbouring State was a national matter. No reply was furnished in respect of Ratanmahal Sanctuary.

The reply of the Department confirms that either no efforts were made to coordinate with the neighbouring States or coordination at appropriate level was not made. Thus, the lackadaisical approach of the Department resulted in ineffective ESZ at the inter-State boundaries of the four Sanctuaries.

⁷ Though the discussion regarding extent of ESZ at interstate boundaries of Gujarat and Rajasthan was initiated in 2015, it did not come to a logical conclusion and the ESZ for Jessore was notified in 2017 with 'zero' km ESZ at interstate boundary with Rajasthan. Subsequently, the ESZ around Mount Abu Sanctuary in the State of Rajasthan was notified in November 2020 which included a stretch of only five Km out of the total 31 Km boundary of Jessore Sanctuary abutting the State of Rajasthan.

3.8 Preparation of Zonal Master Plan

As per the ESZ notifications issued by the MoEF&CC, the State Government shall prepare a Zonal Master Plan (ZMP) within a period of two years from the date of publication of the ESZ notification. ZMP regulates development in ESZs and serves as a reference document for the monitoring committee⁸ for conducting its functions in accordance with the provisions of the ESZ notification. The details regarding preparation of ZMP of the ESZ of the six test-checked Sanctuaries and status thereof are depicted in the following table:

Table 3.4: Details regarding preparation of ZMP for the notified ESZ of Sanctuaries as on 31 March 2022

Name of the Sanctuary	Shoolpane shwar	Jessore	Ratanmah al	Jambughoda	Purna	Balaram Ambaji
Date of final notification of ESZ	05.05.2016	12.10.2017	29.01.2019	08.03.2019	31.05.2012	08.11.2021
Name of Agency entrusted for preparation of ZMP	GEER ⁹ Foundation	GEER Foundation	GEMI ¹⁰	GEMI	GEER Foundation	HNGU ¹¹
Date of decision to allot work for preparation of ZMP	11.07.2017	18.06.2019	18.06.2019	18.06.2019	11.07.2017	24.08.2020
Time gap between final notification of ESZ and allotment of work of preparation of ZMP	14 months	20 months	04 months	03 months	61 months	Nil
Due date stipulated for preparation of ZMP	05.05.2018	12.10.2019	29.01.2021	08.03.2021	31.05.2014	08.11.2023
Status of preparation of ZMP as on March 2022	Not prepared	Not prepared	Not prepared	Not prepared	Not prepared	Not prepared
Delay in preparation of ZMP from the stipulated due date as of March 2022	46 months	29 months	14 months	12 months	94 months	Not applicable

Source: Departmental records and information furnished by the Department.

Audit observed that:

- No centralized mechanism was established for identifying and engaging agencies for preparation of ZMP as in one case the agency was decided at Circle level¹² and in the remaining five cases¹³, these were decided by PCCF (WL).

⁸ Monitoring Committee consists of the District Collector as Chairperson and jurisdictional DCF as Member Secretary in addition to other members and is responsible for monitoring of the provisions of the ESZ notification.

⁹ Gujarat Ecological Education and Research (GEER) Foundation is an autonomous body, set up by the Forests & Environment Department, Government of Gujarat.

¹⁰ Gujarat Environment Management Institute (GEMI) is an autonomous Institute set up under the aegis of Forests & Environment Department, Government of Gujarat.

¹¹ Hemchandracharya North Gujarat University (HNGU) is a public university in Patan, Gujarat.

¹² Balaram Ambaji

¹³ Jambughoda, Jessore, Purna, Ratanmahal, Shoolpaneshwar.

- In the case of Jessore and Purna Sanctuaries, the work of preparation of ZMPs was entrusted to an agency (GEER foundation) by PCCF(WL) after lapse of 20 months and 61 months respectively, from the date of final notification of the respective ESZ.
- The PCCF(WL) while assigning the work, neither executed any MoU/ ToR with these agencies nor fixed any timeline for submission of the ZMP. Due to non-fixation of definite timelines, the agencies did not complete the assigned work even after lapse of 33 months to 56 months since the assignment of work.
- No schedule of payment against the work assigned was formulated, however payments were released for preparation of ZMP in respect of four Sanctuaries. For ZMP of Jessore and Purna, the concerned Division Office released ₹ 15 lakh and ₹ five lakh respectively (May 2020) without any agreement/ estimation of cost provided by the agency. Against GEMI's demand (August 2019) of ₹ 34 lakh for Ratanmahal and ₹ 41 lakh for Jambughoda, the DCF, WL Division, Vadodara released (June 2020) a token amount of ₹ five lakh for each Sanctuary. No amount was released to GEER for Shoolpaneshwar due to want of funds.
- HNGU gave (July 2020) an estimate of ₹ 15.51 lakh which was valid for a period of 60 days with the condition of advance payment of 30 *per cent* of the estimate. This was not paid by the concerned Division as of September 2021. Thus, the validity of the bid lapsed and no progress on Balaram Ambaji ZMP was made (November 2022).

Thus, it can be concluded that the Department did not follow a systematic approach for engaging of agencies and ensuring timely preparation of ZMP and the ZMPs in respect of the five Sanctuaries remained incomplete even after lapse of 12 months to 94 months since the stipulated dates of their completion. Without ZMP, the notification of ESZ did not serve much purpose as no plans were in place for regulating activities in ESZ as envisaged in the notification.

The Department stated (November 2022) that work of preparation of ZMP in respect of the six Sanctuaries was under process.

Recommendation 6: The State Government may ensure preparation and implementation of ZMP of the notified ESZs in a time bound manner for regulation of activities inside the respective ESZ.

3.9 Wildlife Corridors and their Management

The NWAP-2 (2002-16) prescribed undertaking of studies to identify vital ecological corridor, which must be protected. ESZ Guideline (2011) also state that corridors crucial for landscape linkage should be included in the ESZ.

3.9.1 Jessore and Balaram Ambaji Sanctuaries

The Working Plan (2017-18 to 2026-27) for the forests of Banaskantha Forest Division (Part-I) recognised the need of a corridor between Balaram Ambaji

and Jessore Sanctuaries. Details of area identified as corridor in the working plan *vis-à-vis* actual area notified in the ESZ are shown in the table below.

Table 3.5: Area identified as corridor in working plan *vis-a-vis* its inclusion in the ESZ

Name of Sanctuary	Area Identified as Corridor (in Ha) in the working plan		Area Actually notified under ESZ (in Ha)		Percentage of area notified under ESZ	
	Forest Area	Non-Forest Area	Forest Area	Non-Forest Area	Forest Area	Non-Forest Area
Jessore	235.60	1,321.04	127.96	495.05	54.31	37.47
Balaram Ambaji	2,057.57	1,639.79	1,082.14	698.74	52.59	42.61
	2,293.17	2,960.83	1,210.10	1,193.79	52.77	40.32

Source: Working Plan of Banaskantha Forest division for the period 2017-18 to 2026-27.

It can be seen from the table above that only 52.77 and 40.32 *per cent* out of the total identified forest and non-forest area, respectively were included as corridor in the ESZ notification. Thus, out of the total area of 5,254.00 Ha identified as Corridor, 2,850.11 Ha (54 *per cent*) was not included in the ESZ. Inclusion of the area, identified by the Department as corridor, in the ESZ would have facilitated better conservation and management efforts for wildlife.

3.9.2 Jambughoda Sanctuary

The identified corridor of the Sanctuary fell under the jurisdiction of Godhra Forest Division and Chhota Udepur Forest Division. While approving the management plan for Jambughoda Sanctuary (2012-22) it was decided (June 2012) to include the management prescriptions for corridor areas in the working plans of the above two mentioned divisions. However, Audit noticed that no plan for the corridor was included in the working plan of Chhota Udepur Forest Division for the period 2017-18 to 2026-27 (approved in January 2018) while working plan of Godhra Forest Division was yet to be prepared (November 2022). Thus, no arrangement existed for effective management of the identified corridor.

The Department stated (November 2022) that the identified corridors would be communicated to the Godhra and ChhotaUdepur Divisions for inclusion of suitable working plans.

3.9.3 Shoolpaneshwar Sanctuary

Shoolpaneshwar Sanctuary comprising of 607.71 Sq.km area, is surrounded by 565.90 Sq. km of Reserve Forest under Narmada Forest Division. Audit observed that even though the broad potential areas for wildlife corridor had been identified in the management plan and working plan of the Sanctuary/ forest division, the Working Plan Officer (WPO) did not identify the precise wildlife corridor on ground for inclusion in the working plan of the Narmada Forest Division for the year 2017-18 to 2026-27.

The Department stated (November 2022) that corridors in the Sanctuary would be identified and included in the working plan and management plan.

3.9.4 Purna Sanctuary

The Management Plan of Purna Sanctuary for the period 2002-11 had identified 15 Km stretch of dense forest between the Sanctuary and Vansda National Park (VNP) as a potential corridor. Even the Management Plan (2014-15 to 2023-24) of VNP identified an area of 8,294.49 Ha between the VNP and Purna Sanctuary as a wildlife corridor.

Audit observed (September 2021) that ESZ for the Purna Sanctuary extended up to only two Km towards the VNP while the ESZ for the VNP is zero Km towards Purna Sanctuary. As such, the Department did not protect the corridor by including the whole identified stretch under the notified ESZ. Further, types of management initiatives required to operate in corridors had not been defined in the management plans in either of the protected areas. Though, the PCCF (WL) instructed (February 2016) the concerned Divisions to take necessary initiatives to make the proposed corridor operational and protected, no action plan for the corridor had been submitted to PCCF(WL) by the concerned Divisions till date (November 2022).

The Department stated (November 2022) that process for preparation of separate corridor management plan had been initiated in collaboration with Forestry College, Navsari.

3.9.5 Corridors identified by ISRO

A study on 'Habitat Suitability & Corridor analysis for Sloth Bear in Gujarat using Remote Sensing and Ecological Modelling' was conducted (September 2014 to December 2017) by Dr. Nishith Dharaiya¹⁴, Associate Professor, Hemchandracharya North Gujarat University, Patan in collaboration with Space Application Centre (SAC), Ahmedabad of Indian Space Research Organization (ISRO). The study report *inter-alia* identified 12 wildlife corridors and shared it with the Department. The study report also recommended for habitat improvement in the potential corridors. The details of the corridors identified in the study report are as mentioned below:

¹⁴ Dr Nishith Dharaiya is a member of State Board for Wildlife; Co-Chair, IUCN-Species Survival Commission (SSC) Sloth Bear Expert Team; Member, IUCN-SSC Human-Bear Conflict Expert Team. He has contributed in IUCN red list assessment for Sloth bear and coordinated State-wide sloth bear population estimation in Gujarat. He has also authored the Bear Conservation Action Plan for Gujarat.

Table 3.6: Corridors identified by the ISRO study report

Sl. No.	Area where corridor identified	Number of corridors identified by ISRO	Number of corridors identified by the Department
1	Between Balaram Ambaji and Jessore	2 (one portion along Banas River & one along Balaram River)	1 (along Balaram River)
2	Between Balaram Ambaji and polo forest in Vijayanagar	3	0
3	Forest of Sabarkantha, Aravalli and Chhota Udepur	3	0
4	Among Ratanmahal, Jambughoda and Shoolpaneshwar Sanctuaries	3	1 (Between Ratanmahal and Jambughoda Sanctuaries)
5	Shoolpaneshwar and forest of Narmada and Tapi districts	1	0

Source: ISRO study on “Habitat Suitability & Corridor analysis for Sloth Bear in Gujarat using Remote Sensing and Ecological Modelling.”

Audit observed (November 2021) that though prescribed under NWAP-2 (2002-2016), the Department neither conducted any study by itself to identify the corridors nor took cognizance of the findings of the scientific study conducted by ISRO for recognizing, protecting, and developing the wildlife corridors (September 2021). As such, out of the 12 corridors identified by ISRO, the Department recognised only two wildlife corridors. Further, the Department was yet to delineate these two identified corridors on the ground and formulate management strategies for these corridors (November 2021).

The Department stated (November 2022) that in the corridor identified by ISRO along Banas River (in Jessore and Balaram Ambaji Sanctuaries), removal of invasive species, plantation of fruit trees and drinking water facility have been executed for management of the corridor. However, the Department did not furnish any response regarding not recognizing/ formulating management strategies in respect of the 10 (out of the 12) corridors identified by ISRO.

Recommendation 7: *The corridors between the protected areas and other surrounding forests/ protected areas may be identified and plan for their management may be included in the Management/ Working Plan of respective Divisions.*