



CONNECTING
Tiger
**POPULATIONS
FOR LONG-TERM
CONSERVATION**





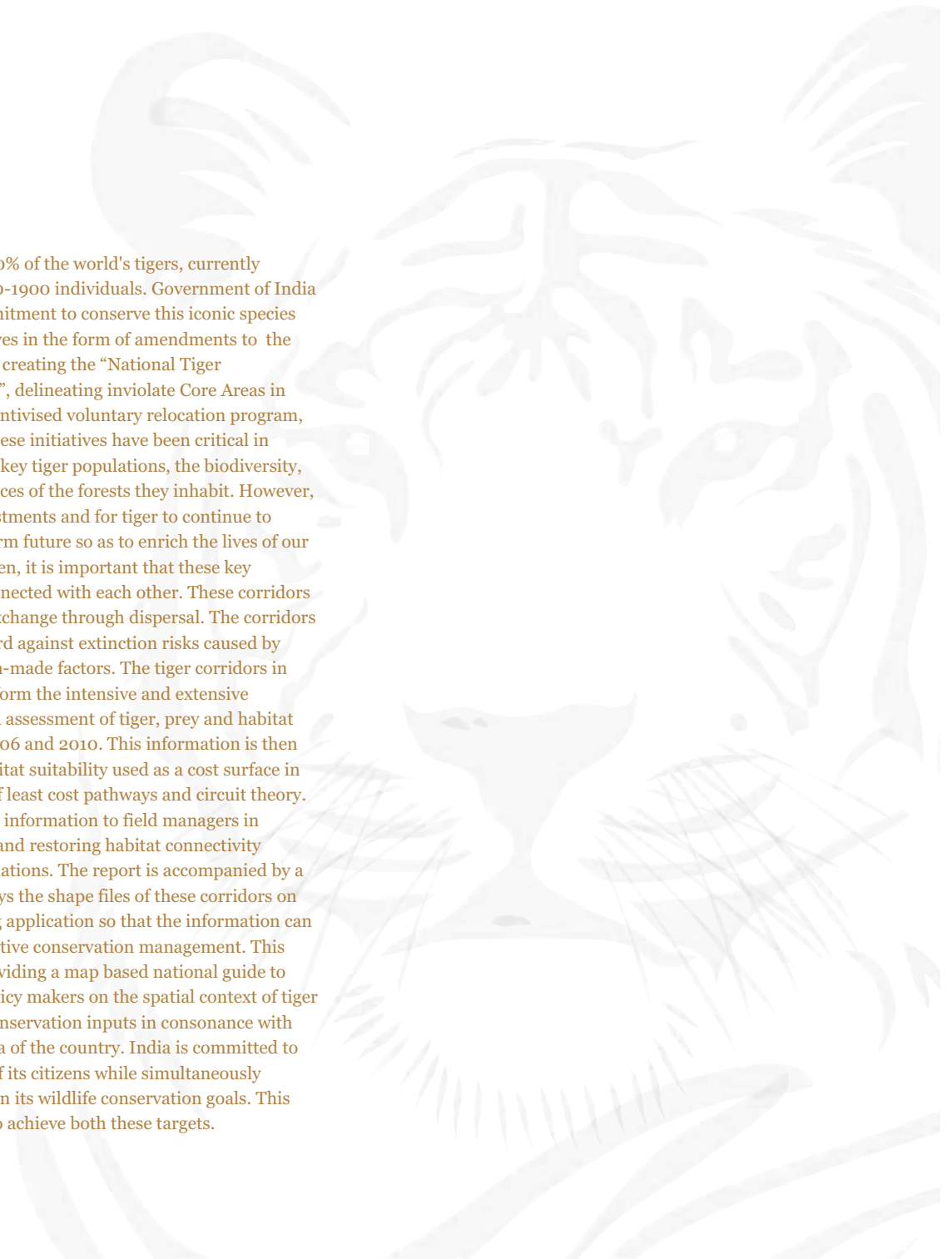
**CONNECTING TIGER POPULATIONS
FOR LONG-TERM CONSERVATION**

Citation

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PREFACE

India is home to over 60% of the world's tigers, currently estimated between 1500-1900 individuals. Government of India has shown strong commitment to conserve this iconic species through several initiatives in the form of amendments to the Wildlife Protection Act, creating the "National Tiger Conservation Authority", delineating inviolate Core Areas in Tiger Reserves and incentivised voluntary relocation program, among many others. These initiatives have been critical in securing the survival of key tiger populations, the biodiversity, and the ecosystem services of the forests they inhabit. However, to safeguard these investments and for tiger to continue to survive into the long-term future so as to enrich the lives of our great-great grandchildren, it is important that these key populations remain connected with each other. These corridors would ensure genetic exchange through dispersal. The corridors would also serve to guard against extinction risks caused by environmental and man-made factors. The tiger corridors in this report are derived from the intensive and extensive countrywide survey and assessment of tiger, prey and habitat assessments done in 2006 and 2010. This information is then used to model tiger habitat suitability used as a cost surface in GIS based algorithms of least cost pathways and circuit theory. They serve as a first-cut information to field managers in identifying, managing, and restoring habitat connectivity between key tiger populations. The report is accompanied by a software CD that displays the shape files of these corridors on any web based mapping application so that the information can readily be used for effective conservation management. This report is the first in providing a map based national guide to Field-managers and policy makers on the spatial context of tiger corridors for guiding conservation inputs in consonance with the development agenda of the country. India is committed to secure the livelihoods of its citizens while simultaneously minimizing its impact on its wildlife conservation goals. This report provides a tool to achieve both these targets.



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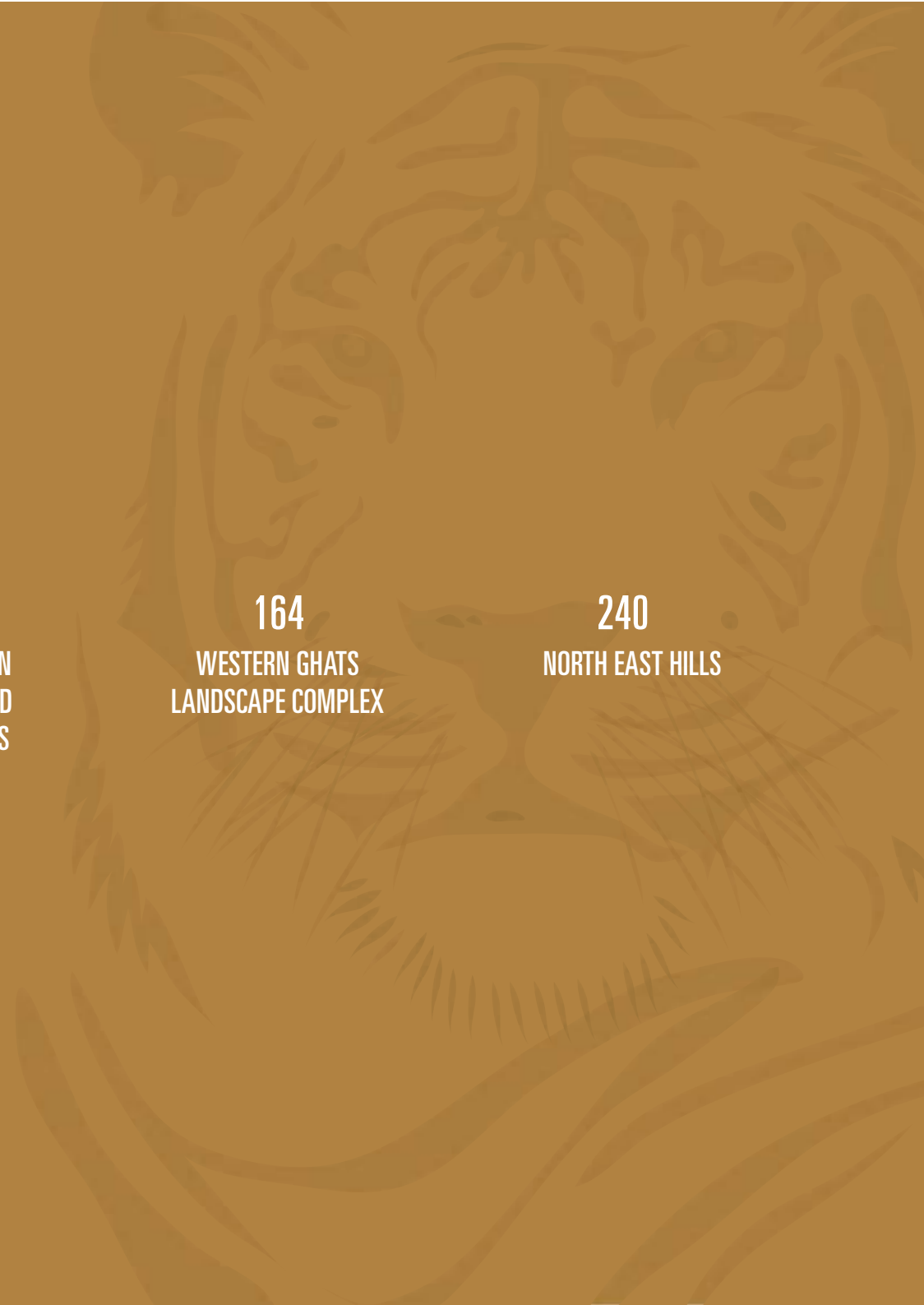
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INTRODUCTION

Being at the top of the food chain and found at low densities, the conservation of large carnivores is a challenge to biodiversity conservation (Chapron G. et al. 2014). With their requirement of large home ranges, carnivores occupy vast areas to harbor viable populations (Purvis et al. 2000). Since historical times, carnivores are in conflict with humans for food and resources, often resulting in their demise (Gittleman et al. 2001). Several factors, such as habitat destruction and excessive hunting by humans in lieu of real or perceived threat to people and their livestock, the use of body parts for traditional medicine, have extirpated many populations (Woodroffe 2000, Clark et al. 1996, Check 2006) while shrinking, fragmenting, and isolating most others to varying degrees (Crooks 2002, Proctor et al. 2005). Small and isolated such populations are prone to local extinctions (Wilcox and Murphy 1985, Woodroffe and Ginsberg 1998), therefore managing them in a meta-population framework (Harrison 1991, Hanski 1994) by connecting through habitat corridors (Beier and Noss 1998, Noss 1987) provides individuals an opportunity to disperse, establish residency and reproduce, reduces the overall risk of extinction (Purvis et al. 2000, Banerjee and Jhala 2012). In comparison to other large cats, tigers having relatively high K selected life history, dispersal and immigration play a vital role in long-term viability of tiger populations (Chapron et al. 2008). Small isolated tiger populations are likely to face extinction due to demographic stochasticity, inbreeding depression (Frankham et al 2002) and poaching (Chapron et al. 2008, Kenney et al. 1995). Therefore, habitat connectivity is essential in sustaining regional populations of tigers, as they require contiguous forest connectivity for dispersal and genetic exchange between populations (Smith 1993; Yumnam et. al. 2014).

The impacts of habitat fragmentation can be mitigated by preventing or reversing population isolation through connectivity conservation (Crooks and Sanjayan 2006), which facilitates the accommodation of species to the shifts in their natural domains due to climate change and maintain their evolutionary potential (Crooks and Sanjayan 2006,

Revilla and Wiegand, 2008; Lowe and Allendorf 2010). Wildlife conservation has emphasized on two primary strategies to promote connectivity. The first focuses on conserving areas that facilitate movement; while the second focuses on restoring connectivity across areas that impede movement. Most connectivity analyses have focused on the former strategy where modeling and mapping areas important for movement are important. In the majority of conservation studies, it is observed that a corridor is a continuous remnant of habitat between otherwise isolated habitat patches (Inglis and Underwood 1992; Beier and Noss 1998). Thus, a corridor is not merely an animal movement path, but also a conservation intervention (e.g., land protection, restoration, and management), when applied to a portion of the potential movement area between habitat patches, it achieves specific connectivity goals in landscapes that would otherwise be fragmented by urban, agricultural, or industrial land uses. The phrase "landscape permeability" which suggests (1) the importance of dynamic processes, (2) the species-specific nature of obstacles to movements, is often substituted for connectivity. It compels conservationists to think about the landscape (including the "matrix" of unprotected land) as a whole, rather than focusing on protected areas and narrow defined corridors (Forman and Godron 1986).

Studies on modeling connectivity has always focused on developing reliable linkage designs (Beier et al. 2008) whereas less attention has been paid to procedures for mapping regional connectivity within numerous natural landscape blocks over large areas, such as a nation, province, or eco-region. Among the methods and metrics used for analyzing connectivity, the two recent and complementary approaches that have gained popularity and provided important conceptual improvements for decision making in conservation planning are graphs (Urban and Keitt 2001) and habitat availability metrics (Pascual-Hortal and Saura 2006). With intensive efforts put towards advancing the best way to quantify and incorporate connectivity in landscape planning, much research work is carried out in field understanding the





underlined meta-population dynamics, focusing on patch based description of connectivity (Moilanen and Hanski 2001). Models distinguishing between habitats of varying quality for a species are prerequisites while estimating functional connectivity, as animals are believed to select movement paths in the same way they choose habitat (Beier et al. 2008). Therefore a reduced ecological cost (e.g., mortality risk) is accounted when individuals move through favourable habitats (Rayfield et al. 2010), demonstrating the significance of high quality habitats to be more permeable to movement than low quality habitats.

Conceived as a landscape feature (Tischendorf and Fahrig 2000) and defined as the connectedness of habitat for a particular species (Fischer and Lindenmayer 2007), connectivity can be a simple structural indices to more complex, biologically detailed, dynamic and spatially explicit meta-population models (Hanski and Ovaskainen 2000, Calabrese and Fagan 2004, Wiegand et al. 2005). Hence, measuring functional connectivity involves understanding the relation between structural characteristics of the landscape with ecological and behavioral characteristics of the species or community of species (Adriaensen et al. 2003). There are several approaches available to evaluate connectivity across complex landscapes, including least-cost path modeling (Adriaensen et al. 2003, Cushman et al. 2010), circuit theory (McRae and Beier, 2007; McRae et al., 2008), other forms of network analysis (Urban et al., 2009), resistant kernel modeling (Compton et al., 2007; Cushman et al., 2010b), agent-based movement (Palmer, Coulon and Travis, 2011), gene flow simulations (Landguth and Cushman, 2010), statistical modeling (Cushman et al., 2006; Compton et al., 2007; Spear et al., 2010) or empirically derived understandings from detailed movement data (Sawyer et al., 2009; Cushman et al., 2011).

In the light of conservation of Tiger, rigorous assessment of the influence of connectivity in maintaining meta-population framework is a necessary component in planning. The tiger (*Panthera tigris*) acts as a umbrella and focal species for the conservation of forested

ecosystems throughout its range in Asia (Tilson and Seal 1987). Although widely debated (Simberloff, 1998; Caro and O'Doherty, 1999; Lindenmayer and Fischer, 2003; Wiens et al., 2008), the focal species concept is important in landscape planning for wildlife management and conservation as it allows action with incomplete knowledge, address the conservation or management requirements of whole communities by focusing on a species subset (Lambeck, 1997). The approach is widely used not only to design protected areas (e.g. Noss et al., 1999; Gopal 2014) but also to plan wildlife linkages (i.e. corridor networks for multiple species), to maintain connectivity among protected areas (e.g. Sanderson et al., 2002b; Rouget et al., 2006; Thorne et al., 2006; Beier et al., 2008; Yumnam et al. 2014).

Conserving the tiger typifies the prospects and challenges inherent in the current paradigm of fragmented small populations and landscape based conservation models in large carnivores (Dolrenry et al 2014). Extant tiger populations are confined to fewer than 7% of their historical range in patchily distributed habitats across a range of twelve regional tiger conservation landscapes (TCLs) in southern and north-eastern Asia (Dinerstein et al. 2007). Six global priority TCLs of long-term tiger conservation significance are present in the Indian subcontinent alone. These Indian TCLs are important for global tiger recovery as they harbor over 60% of the estimated global population of ~3,000 wild tigers (Sanderson et al. 2006, Jhala et al 2011), and >60% of the global genetic variation in the species (Mondol et al. 2009). The high genetic variation seen in Indian tigers could be attributed to historically high population sizes, numbering about 50,000 individuals until c. 200 years ago, and habitat contiguity that permitted genetic exchange between the various regional tiger populations in the area (Mondol et al. 2009). Due to change in land ownership and forest use policy in the mid nineteenth century during British rule and again during the early years of India's independence a century later, much of the forest was cleared for timber and agricultural needs (Rangarajan 1996, Rangarajan 2006). This change in land use combined with

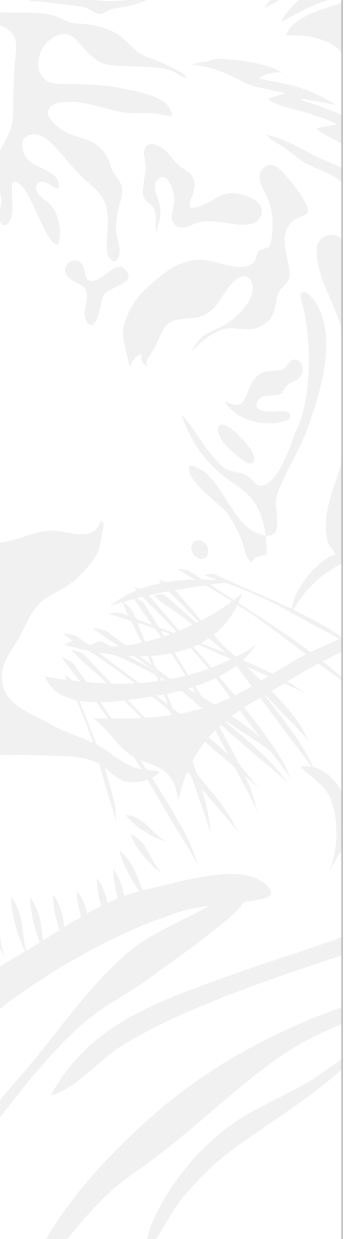
organized trophy hunting and bounty driven extermination resulted in severe decline, fragmentation and isolation of tiger populations throughout India (Rangarajan 2006, Narain et al. 2005). The strong wildlife legislation (The Indian Wildlife (Protection) Act, 1972) and the launching of Project Tiger in 1973 where the tiger, the top charismatic carnivore was used as a flagship and umbrella species for conserving the biodiversity of India's forested ecosystems marked the beginning of a new conservation era in India. Currently, within the six tiger occupied landscapes of India (Jhala et al. 2008), habitat contiguity varies extensively, with the best being within the Western Ghats and the North East, while fragmentation is highest in the Shivalik-Gangetic Plain and the Central Indian Landscapes (Jhala et al. 2011; Yumnam et al. 2014). Most of the connecting habitats in these landscapes are not within the legal domain of protected areas and are often lost to burgeoning development demands of a growing economy and attrition by human consumptive uses.

Currently in India, the once contiguous tiger population is now fragmented with source populations primarily restricted to tiger reserves. A tiger reserve is legally mandated to designate a critical core area wherein human habitation and resource extraction is not permitted (Wildlife Protection Act 1972, amendment 2005, (The Indian Wildlife (Protection) Act, 1972). This core is surrounded by a buffer zone, which is essentially a multiple use area, wherein conservation objectives are to be given precedence over other land uses. Breeding populations of tigers are mostly located in the core area of tiger reserves, while the buffers usually serve as population sinks (Karanth et al. 2005, Jhala et al. 2011a,b). The size of these tiger reserves vary between 344 km² to 3,150 km² (average 1,321 km²), with tiger densities ranging from about 0.1 to 20 individuals per 100 km² (Jhala et al. 2011, Jhala et al. 2011a, Walston et al. 2010). For a demographically viable tiger population, a minimum of 20 to 25 breeding units are believed to be essential (Walston et al. 2010, Chapron et al. 2008, Gopal et al. 2010; 2014). As such, many extant tiger populations are by

themselves inadequate for long-term persistence (Kenney et al. 1995, Linkie et al. 2006), either because of habitats harboring a low number of breeding tigers, small size of the protected area and/ or ecologic isolation from other populations. High spatial genetic structuring and small population size observed in today's Indian tiger populations dictates preserving them in a metapopulation framework wherein individual populations are connected through a permeable habitat matrix and can occasionally exchange individuals (Hanski and Gilpin 1997). This would result in re-colonization of suitable habitat patches where tigers have become locally extinct and rescue declining local populations from extinction by immigrants (Hanski 1999, Brown and Kodric-Brown 1977). Understanding and managing the metapopulation framework of extant tiger populations is an important strategy for ensuring their long-term conservation. Connecting tiger source populations within tiger landscapes by identifying, restoring and conserving habitat corridors will not only enhance long-term tiger conservation objective but will serve to address the need for gene flow for many other biota as well.

In this document we provide a preliminary map of minimal habitat corridors connecting source populations of tigers in India. The mapped corridors are based on least cost corridors and least resistance pathways using circuit theory. Though these models are based on real life data on tiger habitat suitability obtained from extensive ground surveys during the country wide assessment of tiger status (Jhala et al 2011), however, they still need site specific ground validation for micro-adjustments. Field managers can use these as first cut information for their tiger





conservation plans that include landscape scale connectivity as an important component. The corridors shown in this report are minimal requirement. Alternative connectivities do exist in many areas and need to be conserved as well. Many of these alternative connectivities are highlighted by the resistance based connectivities (circuitscape) in this report and need conservation attention as well. The bottlenecks in the minimal corridors need special attention through enhanced protection and restoration ecology inputs. Infrastructural development within corridors should be minimal, and whenever permitted for larger National interests, it should include a "green mitigation design" for ensuring that the corridor permeability for tigers is not compromised. In the absence of any formal maps on corridor, this report will serve to provide this much needed information for long-term tiger conservation.

MATERIALS AND METHODS

Field Data Collection for Occupancy Analysis

Tiger Sign Surveys

The entire study area was divided into 10 km x 10 km grids. Each grid that contained potential tiger habitat (forest) was surveyed by replicate search paths for tiger sign. The number of surveys per grid ranged from 3 to 35, and was proportional to the amount of tiger habitat within each grid. Each survey consisted of a 5 km search for tiger signs. Surveys were not random, but instead conducted along features that were likely to have tiger sign e.g. dirt roads, dry water courses, and animal trails (Jhala et al. 2011). Surveys were conducted by the local guard and a local assistant who had intimate knowledge of the forest and were trained to observe and record tiger sign in pre-designed datasheets. All encounters of tiger pugmark track sets and scats were recorded. These were distinguished from those of other carnivores based on criteria described by (Jhala et al. 2009 and Karanth and Nichols 2002). A total of 44,8005 km of search effort was invested in 89,600 replicate surveys between December 2009-February 2010 (cold and dry season) across the entire country to adhere with the assumption of occupancy closure (MacKenzie et al. 2006) and have minimal influence of weather (rainfall) on sign detections and distribution. A total of 9309 grids were sampled.

Prey Assessment

Within each forest beat, one or two permanent line transects of 2 to 4 km in length were delineated. Each transect was walked on two or three subsequent mornings (06:30 to 08:30 hrs) by two observers to record encounter rates of wild ungulates and domestic livestock. Data on number of each species seen and the length of transect were recorded to compute encounter rates of each species. In disturbed forests (outside of Protected Areas) wild ungulate densities were low, animals were shy, and difficult to record using line transects. Therefore,

at every 400 m along the line transect we also sampled a plot of 20 x 2 m to record ungulate dung. Dung was visually distinguished to species (Jhala et al. 2009) and dung density for each species, wild ungulates as a group, and domestic livestock was computed separately. Encounter rates of ungulates and dung density were used as indices of ungulate abundance. The number of transects within each 100 km² grid ranged from 1 to 74, and were proportional to the quantum of tiger habitat within that grid. Total effort invested in transect survey was 1,79,202 km of walk in 89600 replicates.

Human Disturbance - At every 400 m along transects established for ungulate assessment a plot of 15 m radius was sampled to assess indices of human impact. Presence of (a) human/livestock trails within the plot, and (b) sighting of humans and livestock from the plot were recorded (Jhala et al. 2009) The number of plots within a 100 km² grid ranged from 5 to 147. The total number of plots sampled across the country was 4,48,000.

Remotely Sensed Variables

Remotely sensed data that depict landscape characteristics and human impacts were obtained from various sources and extracted at the 10 X 10 km grid. Forest cover was obtained from the Forest Survey of India (FSI 2009) that is based on IRS 1D LISS III satellite with 4 multispectral band data at 23.5 m resolution. Normalized Differential Vegetation Index (NDVI) information were derived from 1 km² Advanced Very High Resolution Radiometer (AVHRR) data, acquired from the National Aeronautics and Space Administration's (NASA) Television Infrared Observation Satellite (TIROS) (<http://science.nasa.gov/missions/tiros/>; accessed Dec 23, 2010). Road and drainage information were obtained from Digital Chart of the World (<http://statisk.umb.no/ikf/gis/dcw/>; accessed Dec 20, 2010). Protected Area shape files were obtained from the wildlife database at the Wildlife Institute of India, National Tiger Conservation Authority and State Forest Departments of India. The



Shuttle Radar Topography Mission has produced the most complete, high-resolution digital elevation model of the earth (Rodriguez et al 2005). Within each 1 km² grid, this information was used for computing average elevation and the coefficient of variation of elevation used as a measure of terrain ruggedness. Night light data was obtained from U. S. Air Force Defense Meteorological Satellite Program (DMSP) and National Oceanic and Atmospheric Administration's (NOAA) Operational Linescan System (OLS) (<http://www.ngdc.noaa.gov/dmsp/sensors/ols.html>; accessed Dec 18, 2010). Density of roads (length of paved road per km²), and Euclidean distances to roads, Protected Areas and Night Lights were computed in ArcGIS 9.3 (www.esri.com) software.

Occupancy Modeling

Though sampling was done at the level of the forest beat so as to ensure an even distribution of sampling effort across the landscape, analysis was done at the scale of 9309 grids, each of size 10x10 km². This grid size was chosen since it was larger than the size of an average tiger home range (Sharma et al. 2010, Karanth KU and Sunquist ME 2000) and the size was relevant for subsequent administrative and managerial inputs. Sign surveys of 5 km independent spatial replicates within each grid (Kendall WL and White GC 2009) were modeled to address the issue of imperfect detections of tiger sign using program PRESENCE (Hines 2006). Detection of tiger signs was likely to depend on the abundance of tigers within a grid (Karanth et al. 2011). We first modeled the detection process by i) keeping detection (\hat{P}) constant across surveys, ii) \hat{P} varying across surveys and iii) \hat{P} as a function of tiger abundance in that grid, wherein we used average encounter rate of tiger sign as an index that surrogated tiger abundance (Jhala et al. 2011, Karanth et al. 2011). The model that best explained the detection process based on Akaike Information Criteria (AIC) was then used in all subsequent models of tiger occupancy.

Tiger site occupancy was a *priori* expected to be positively influenced by a) prey abundance, and b) amount and quality of tiger habitat, and negatively influenced by c) human disturbance (Jhala et al. 2011, Karanth et al. 2011, Harihar and Pandav 2012). We tested these hypotheses by modeling variables representing these factors as covariates using the logit link function in PRESENCE (MacKenzie et al. 2006, Hines 2006). We initially generated data on 23 site covariates that represented landscape and habitat features (Forest area, Core Forest area, Forest patch size, Normalized Differential Vegetation Index (NDVI), Elevation, Ruggedness, drainage density, rainfall, distance to protected area), Prey availability (Chital, Sambar, wild pig and Gaur encounter rates on line transect walks, and wild ungulate dung density), human disturbance (distance to night lights, distance to roads, humans and livestock encountered on transect walks, human/livestock trails within sampled plots, and livestock dung density) that could potentially explain tiger occupancy. These covariates were examined with exploratory data analysis for their interrelationships and relationship to tiger presence (by scatter plots, box plots, and correlation analysis). The variables were modeled as covariates in a logit link function to model tiger occupancy in the program PRESENCE available for download from <http://www.proteus.co.nz/>. Model selection was done using AIC and model fit was assessed by comparing the actual detection histories with simulations generated from 50,000 parametric bootstrap runs of the target model in PRESENCE. Models were built using prey abundance, human disturbance and habitat quality, these were evaluated against the null model and the full model by their delta AIC values. A total of six models were evaluated for modeling tiger occupancy and coefficient estimates for all models with delta AIC < 2 were averaged based on model weights (MacKenzie et al. 2006) to arrive at occupancy probability (Ψ) in each grid (Yumnam et. al. 2014).

Tiger Population Extents and Occupied Habitats

We used two approaches to estimate population extents and area of occupied habitats; (i) a more conservative approach wherein we considered only those grids that detected tiger sign as being occupied (the naïve estimate) and (ii) model inferred occupancy that corrected for detection bias and covariates in PRESENCE. Herein, landscape scale occupancy was computed by sum of cell occupancy probability values and divided by the total number of cells. Tiger habitat (forested area) in each grid was weighted by the tiger occupancy probability of that grid and summed across all grids to arrive at occupied tiger habitat for the landscape (Karanth et al 2011). All adjacent tiger sign detected cells were joined and were considered to be occupied by a single tiger population.

Habitat Corridor Modeling

Grid based tiger occupancy probability (Ψ) obtained from PRESENCE was used as a measure of habitat suitability for tigers (Boyce et al. 1999, MacKenzie et al. 2006). A cost surface for tiger habitat suitability across grids was generated as $1-\Psi$. This was used as a resistance layer for modeling habitat connectivity using least cost (Sawyer et al. 2011)

and circuit theory (McRae et al. 2008) analyses. Least-cost pathways (LCP) were modeled using PATHMATRIX (Ray 2005), and resistance pathways were modeled using CIRCUITSCAPE (McRae and Shah 2009). Core areas of tiger reserves were considered as "sources" or areas of high potential from which tiger movement across paths of least resistance were modeled across the landscape. PATHMATRIX models several potential routes in a radiating manner from the "source" to connect to another adjacent "source". It then selects a single "least cost" pathway as the best alternative. CIRCUITSCAPE models connectivity through habitat swaths, considering resistance to movement based on pixel cost and corridor width (McRae et al. 2008). It provides one to several potential alternatives for joining sources and helps in identifying bottlenecks within the corridors. Since Central Indian Landscape is a human dominated landscape with clearly defined and limited forested habitat, we could overlay LCP on high resolution Google Earth images and align them to match geographical features within occupancy grids, to delineate realistic corridors. These least cost corridors buffered by 1.5 km (LCC) were considered the minimal essential corridors joining two tiger reserves.







SHIVALIK HILLS AND GANGETIC PLAINS



1

THE SHIVALIK HILLS AND GANGETIC PLAIN LANDSCAPE

The Shivalik Hill and Gangetic Plain landscape comprises of Uttarakhand, Uttar Pradesh and Bihar. The entire landscape has 4 Tiger Reserves with about 351 tigers.

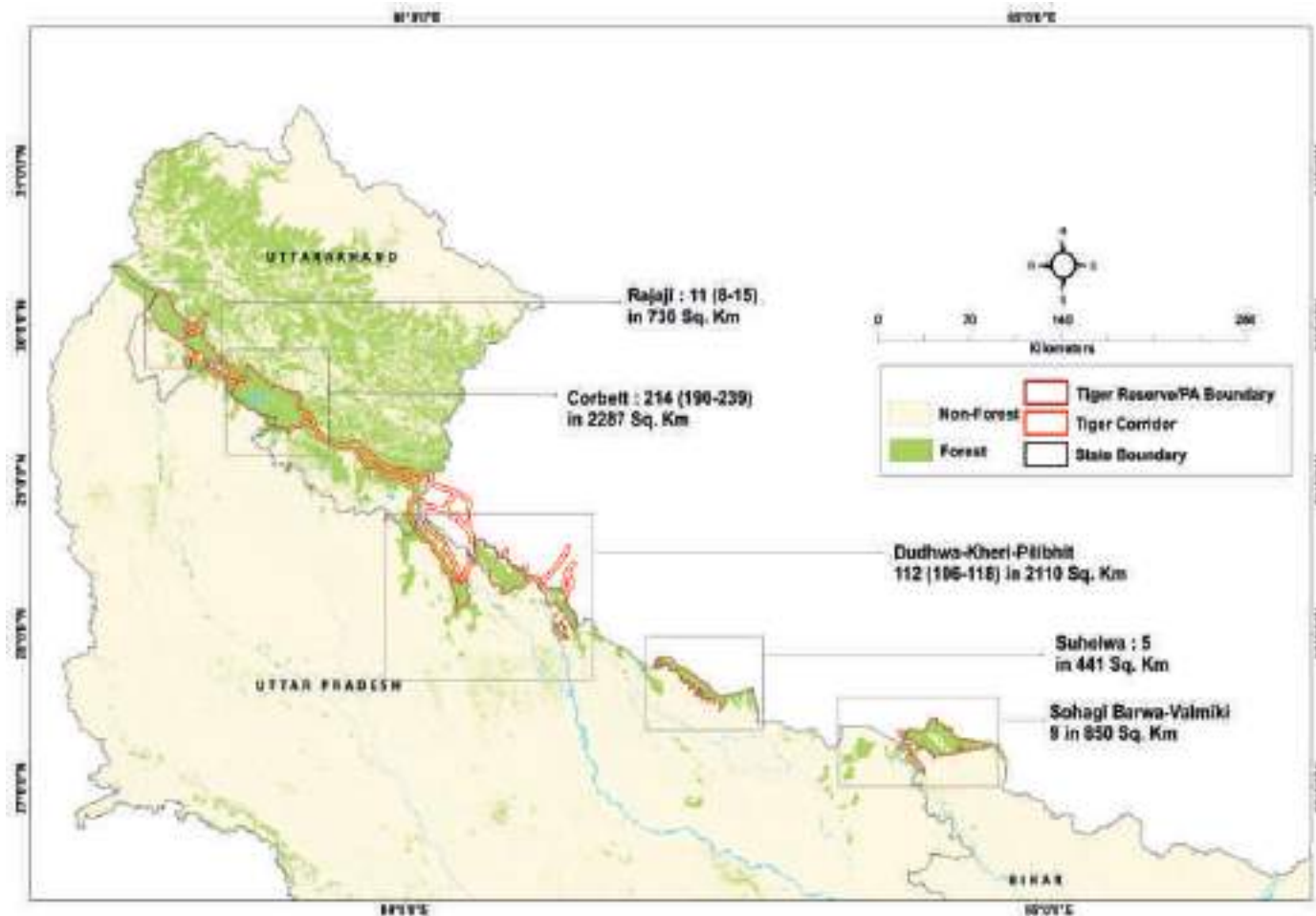
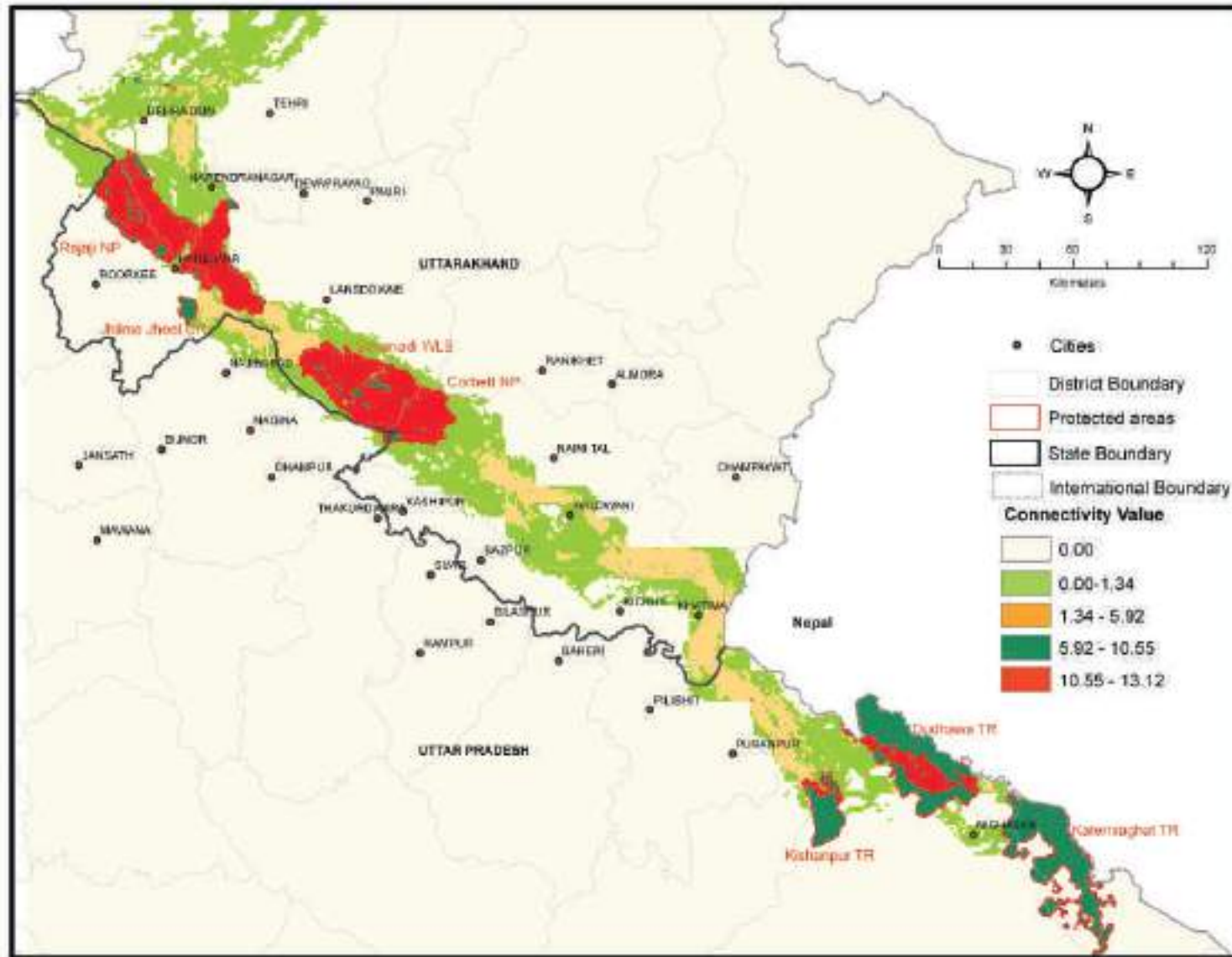


Figure 1.1:
Tiger Populations and Corridors of Shivalik and Gangetic Plain



Figure 1.2:
Map showing
Landscape connectivity
in Shivaliks modeled
Using CIRCUITSCAPE



CORRIDORS OF SHIVALIK HILLS AND GANGETIC PLAINS

Kansrao-Barkot connects Rajaji National Park with Dehradun Forest Division. A narrow strip of forest west of Lal Dhang town connects Rajaji National Park with Jhilmil Jheel Conservation Reserve. Highway and a canal crosses the corridor which need mitigation in the form of passageways to maintain long term wildlife movement. The Chilla Range (eastern Rajaji) is connected with Motichur Range (western Rajaji) by Chilla-Motichur connectivity. This corridor is severely impaired restricting the movement of tigers to western Rajaji, across River Ganga.

The most used part of this region, through the Motichur Rau, is constricted by high human habitation due to the growing township of Haridwar on the south. To the north, a settlement (Khand Gaon 3) housing the Tehri dam oustees is located along with an army ammunition dump but is still potentially viable. This portion needs to be restored through acquisition and restorative management.

River Song flowing into the River Ganga between Raiwala and Rishikesh forms a corridor that is heavily impacted by human habitation and agriculture. A lot has been written on the importance of this critical corridor for elephants as well as other wildlife. However, there has been little progress on ground to revive it. Important considerations for revitalizing these corridors are: mitigation of the impact of the Delhi-Dehradun highway and railway traffic, power canal, and prevention of encroachment of the river islands in the River Ganga.

The Rajaji-Corbett corridors comprises of two smaller corridors: one through the Shivalik Hills (Lansdowne Forest Division) and the other through the Shivalik foot-hill forests of Haridwar and Bijnore Forest Division that connects Rajaji to Corbett Tiger Reserve (Sonanadi Wildlife Sanctuary). Both these corridors (more so the Bijnore forest corridor) are threatened by the growing township of Kotdwar. The Bijnore

RAJAJI-CORBETT

corridor faces severe bottleneck south-east of the township of Kotdwar where it passes through agriculture and human settlements.

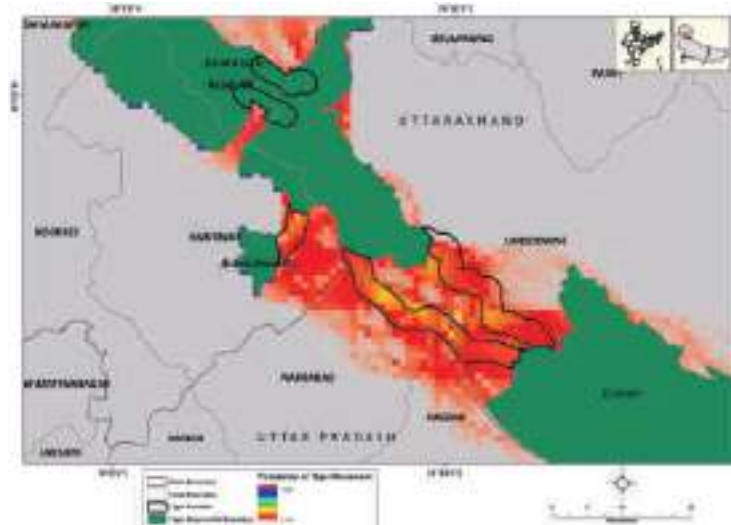


Figure 1.3:
Potential habitat connectivity for tiger movement between Rajaji-Corbett as depicted by CIRCUITSCAPE model

Rajaji-Corbett	
Habitat size	24792 Km ²
Source Population	Rajaji and Corbett
Size of Source	8-15 (Rajaji) 190-239 (Corbett)
Protected Areas	Rajaji NP Corbett Tiger Reserve Jhilmil Jheel Conservation Reserve
Corridors	Rajaji-Corbett

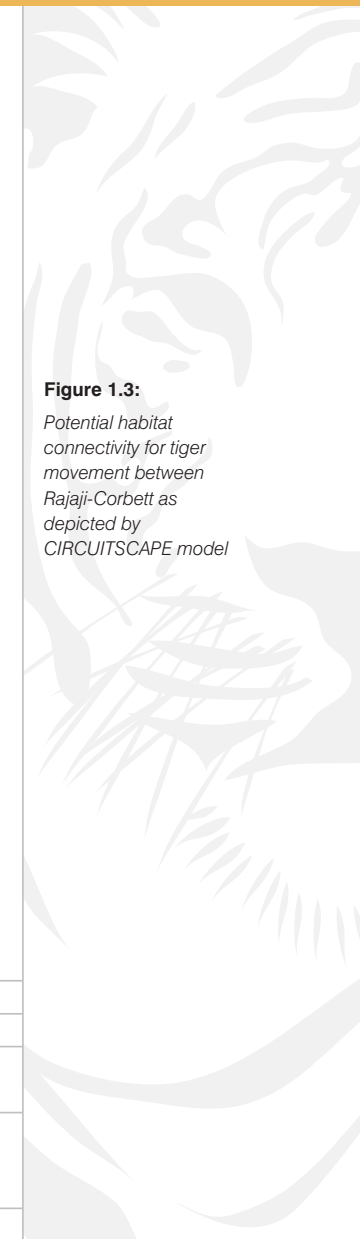
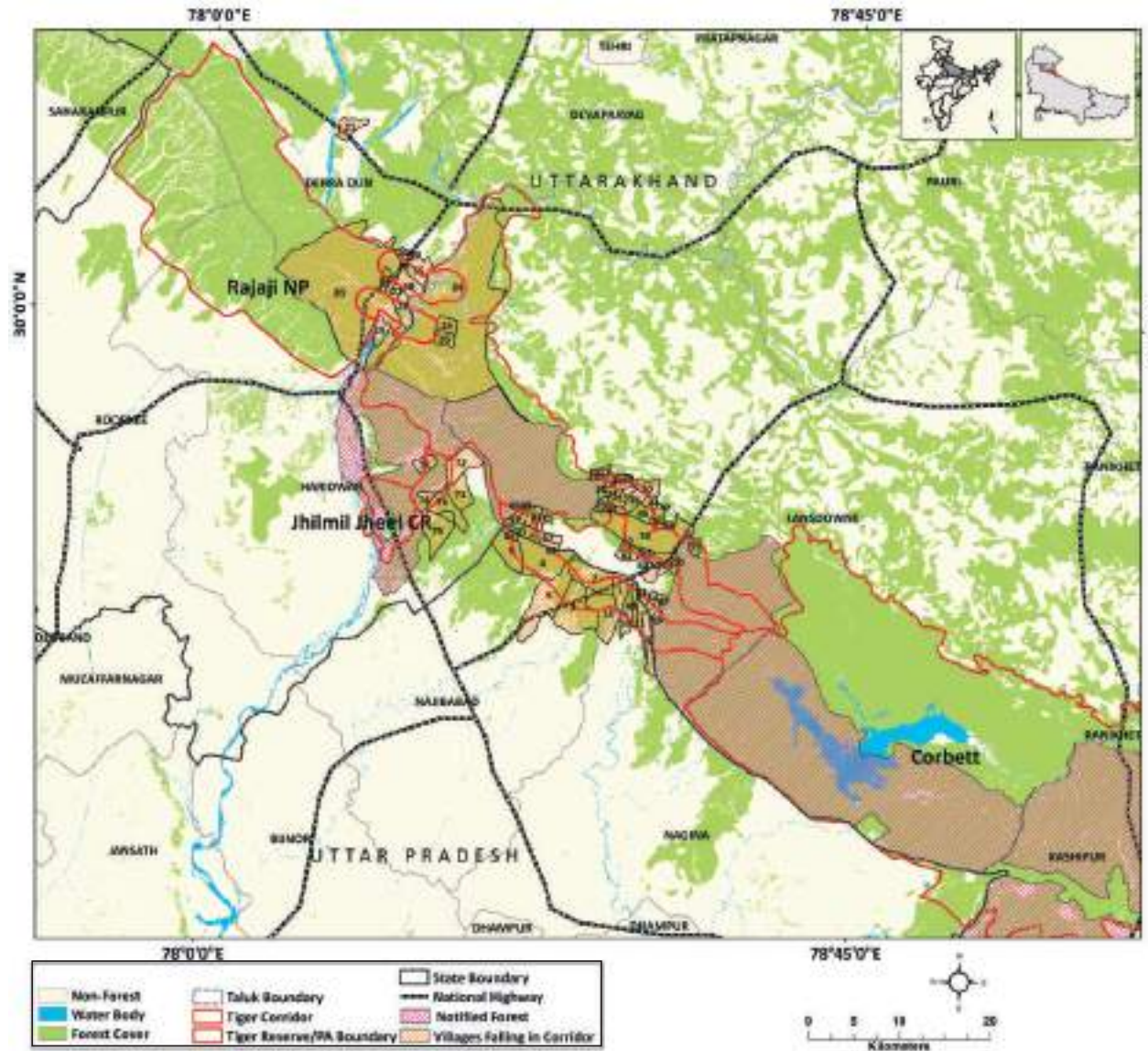


Figure 1.4:

Least Cost Pathway corridor for Tiger movement Rajaji-Jhilmil Jheel, Rajaji-Corbett and within Rajaji (Chilla-Motichur) overlaid with village map (the village numbers are referenced in Table 1.1)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Uttar Pradesh	Bijnor	Najibabad	Kouriya	60	294	122	594
2			Najibabad	Chatruwala	38	189	35	157
3			Nagina	Qadarganj	60	388	67	293
4			Najibabad	Haldu Khata	5	30	21	125
5			Najibabad	Ramnagar	3	18	5	49
6			Najibabad	Madduwala	140	818	110	609
7			Najibabad	Motadhar	142	744	162	763
8			Nagina	Telipara	121	550	259	1075
9			Nagina	Rajpur Kot	8	22	1	1
10			Nagina	Shankerpur	21	101	12	54
11			Nagina	Sulema Shikohpur	45	222	42	204
12			Najibabad	Rahman Nagar	NA	NA	NA	NA
13			Najibabad	Sanywala	NA	NA	NA	NA
14	Uttarakhand	Dehradun	Rishikesh	Thakurpur	55	302	71	344
15			Rishikesh	Kharakmaf	974	5397	1699	8404
16			Rishikesh	Kheri Khurd	293	1571	NA	NA
17			Rishikesh	Shyampur	679	3945	1432	7052
18			Rishikesh	Mohri Mafi	328	1850	NA	NA
19			Rishikesh	Haripur Kalan	942	4720	2328	10367
20			Dehradun	Motichur Range	NA	NA	NA	NA
21			Dehradun		NA	NA	NA	NA
22			Dehradun	Pratit Nagar	NA	NA	NA	NA
23			Chakrata	Raiwala	NA	NA	NA	NA
24		Garhwal	Kotdwara		NA	NA	NA	NA
25			Kotdwara	Ganga Bhogpur Malla	193	934	214	1030
26			Kotdwara	Ganga Bhogpur Talla	56	302	75	610
27			Kotdwara	Simalna Talla	11	39	27	112



Table 1.1.
Villages within the Least Cost Pathway Corridor between Rajaji-Jhilmil Jheel, Rajaji-Corbett and within Rajaji (Chilla-Motichur) as shown in Fig. 1.4



Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
28			Kotdwara	Chaundali	43	223	43	206
29			Kotdwara	Simalna Bichala	7	35	35	149
30			Kotdwara	Mathana Bichala	48	227	83	356
31			Kotdwara	Mathana Malla	33	149	NA	NA
32			Kotdwara	Mathana Talla	11	58	NA	NA
33			Kotdwara	Utircha	107	464	117	447
34			Kotdwara	Gwiral	20	89	17	66
35			Kotdwara	Kandai	90	426	91	396
36			Kotdwara	Ginthala	20	61	18	66
37			Kotdwara	Gandriyakhal	57	299	84	391
38			Kotdwara	Balli	141	600	150	590
39			Kotdwara	Edabara	13	67	5	15
40			Kotdwara	Edachota	NA	NA	NA	NA
41			Kotdwara	Lalpur	234	1087	415	1864
42			Kotdwara	Jayadevpur	76	327	92	442
43			Kotdwara	Bhupdevpur	38	186	53	274
44			Kotdwara	Katal	47	195	43	157
45			Kotdwara	Edamalla	8	31	6	20
46			Kotdwara	Sylinga	46	208	43	185
47			Kotdwara	Tachali	17	76	16	56
48			Kotdwara	Dalipur	41	225	64	294
49			Kotdwara	Mandevpur	34	190	45	204
50			Kotdwara	Kotdwar Gaon	327	1612	188	851
51			Kotdwara	Lokmaripur	146	827	190	960
52			Kotdwara	Dhurwapur	198	988	320	1533
53			Kotdwara	Koriya	172	866	276	1311
54			Kotdwara	Gaujura	13	68	18	74

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
55			Kotdwara	Bhawanipur	5	17	6	33
56			Kotdwara	Grastan Ganj	136	654	200	924
57			Kotdwara	Jhandichaod Uttri	264	1439	422	2073
58			Kotdwara	Jhandi Chaur West	319	1757	NA	NA
59			Kotdwara	Jamargadi Talli	51	261	59	254
60			Kotdwara	Manpur	847	3751	NA	NA
61			Kotdwara	Padampur Sukhran	1368	6555	2406	9802
62			Kotdwara	Shivpur	767	3688	1055	4889
63			Kotdwara	Ratanpur	210	1116	329	1478
64			Kotdwara	Lapani Walli	131	692	NA	NA
65			Kotdwara	Kotridhank	111	556	154	799
66			Kotdwara	Harsinghpur	211	1011	406	1820
67			Kotdwara	Lalpani Palli	97	512	283	1333
68			Kotdwara	Saneh Palli	81	406	NA	NA
69			Kotdwara	Saneh Walli	42	216	NA	NA
70			Kotdwara	Kotdwara	NA	NA	NA	NA
71		Haridwar	Haridwar	Samaspur Katarbarh	91	577	116	647
72			Haridwar	Rasool Pur Mithi Beri	766	4324	1041	5953
73			Haridwar	Peeli Parhav	249	1697	NA	NA
74			Haridwar	Nalo Wala	27	154	59	403
75			Haridwar	Gaindikhata	351	2179	549	2817
76			Haridwar	Pamrhowali	NA	NA	NA	NA



Figure 1.5:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Rajaji-Jilmil Tal, Rajaji-Corbett and within Rajaji (Chilla-Motichur)



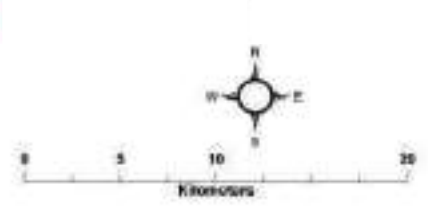
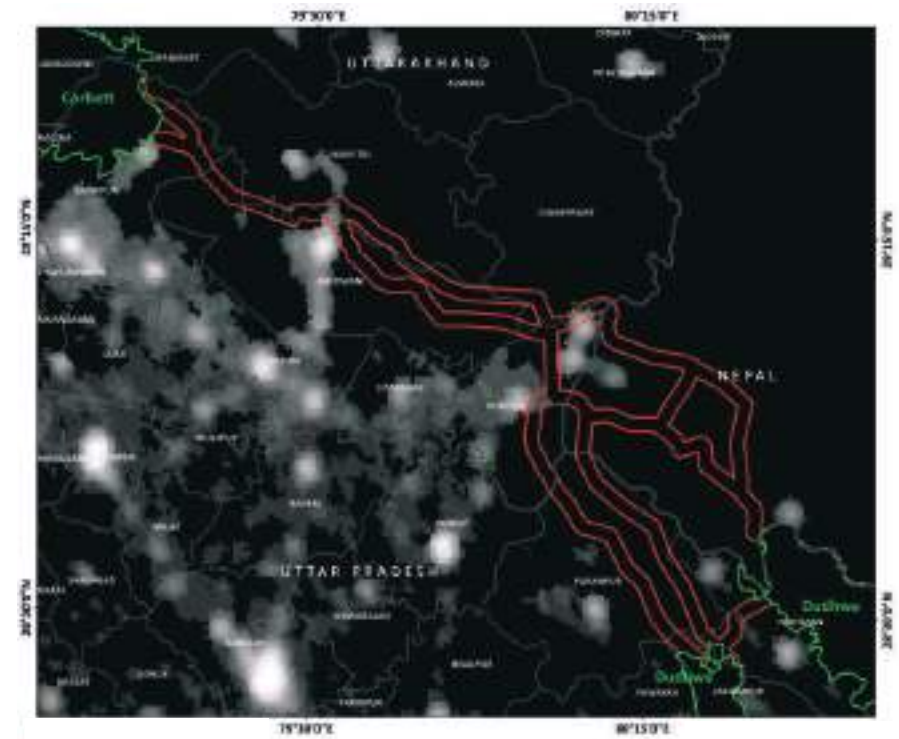
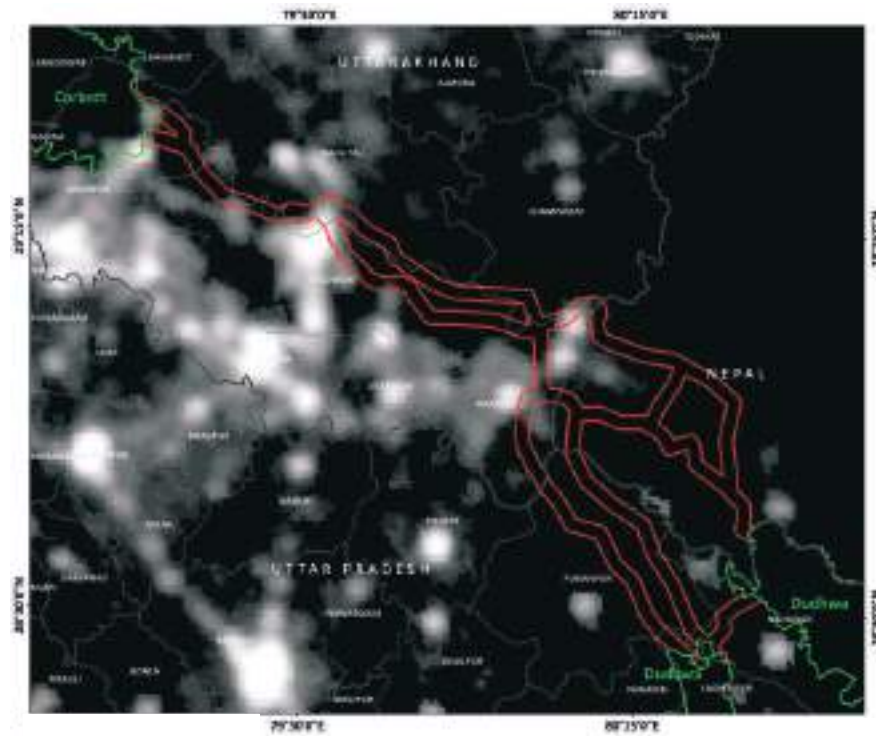


Figure 1.6:
Human habitation as depicted by nightlights within the Rajaji-Corbett landscape in the year 1992 and 2012

CORBETT-DUDHWA

Kosi River corridor connects Corbett Tiger Reserve to the Ramnagar Forest Division and onwards to the Forest Divisions of Terai West, Terai East and Haldwani. The connectivity between Corbett Tiger Reserve and the forests east of River Kosi, towards the plains, is impacted by the city of Ramnagar. Towards the north, the steeper slopes of the lower Himalayas make the connectivity tenuous for species like the elephant. Linear development of resorts and hotels along the highway from Ramnagar to Almora along the banks of the Kosi makes the intervening habitat matrix hostile to movement of wildlife. Currently only two corridors remain, one to the north of Dhikala entrance to Corbett near Garjia Temple crossing the Kosi River, and another commencing from Bijrani Gate of Corbett eastwardly to Kosi River and beyond. The northern boundary of this southern corridor is south of the Dhikuli village and north of River Tons. The above two corridors are the only vital linkages for gene flow between Corbett and the eastern populations of tigers and elephants in UP (Kishanpur and Dudhwa) and Nepal (Suklaphanta and Bardia National Parks).

Due to the high demand and price of land within these corridors for tourism ventures, policy and legislation need to be implemented urgently to secure them at the earliest before development deteriorates them further. Settlements in the northern section of the Reserve such as Sundarkhal need to be urgently relocated.

The connectivity through the plains (Gadgadia-Terai Central) forests, south of the city of Haldwani is now deteriorated beyond recovery due to the growth of Lal Kuan and Haldwani infrastructure, along with agriculture and industry. The plains/foot hills corridor from east of Haldwani passes north of Chorgalia town through the forests of Terai East Forest Division. Though the least cost pathway defines the corridor across the Shivalik Hills in the East Terai Forest Division, the forests in the terai belt (plains) that are currently fragmented patches are extremely important for movement of elephants that are unlikely to use the Shivalik corridor. The Nihil-Bhakra corridor north of Kamala and Kaladhungi is important for tiger movement.

Gola River corridor comprises of the north Kosi and south Kosi corridors that connect south west of Rampur village and continue eastwards

through the forests of Choti Haldwani and Kaladhungi upto the townships of Haldwani and Kathgodam. It is at this juncture that a severe bottleneck exists across River Gola.

The optimal path is through the plains section north of Kathgodam which is negotiable by elephants. However, a less impacted corridor through the hilly tracts along River Gomti is a viable option for other wildlife including tigers.

In Terai East, south-west of the township of Tanakpur (Kilpura range) the corridor bifurcates into two branches: the Kilpura corridor going north of Tanakpur to cross River Sharda above the barrage going into Nepal (Churia Hills-Bhramgiri Forests), and the Khatima-Surai corridor goes south via Khatima and Surai Range into Pilibhit connecting further to Kishanpur (Dudhwa Tiger Reserve).

Corbett-Dudhwa	
Habitat size	24792 Km ²
Source Population	Corbett and Dudhwa-Pilibhit
Size of Source	190-239 (Corbett) 106-118 (Dudhwa-Kheri-Pilibhit)
Protected Areas	Corbett Tiger Reserve Dudhwa Tiger Reserve Pilibhit Tiger Reserve
Corridors	Corbett -Dudhwa

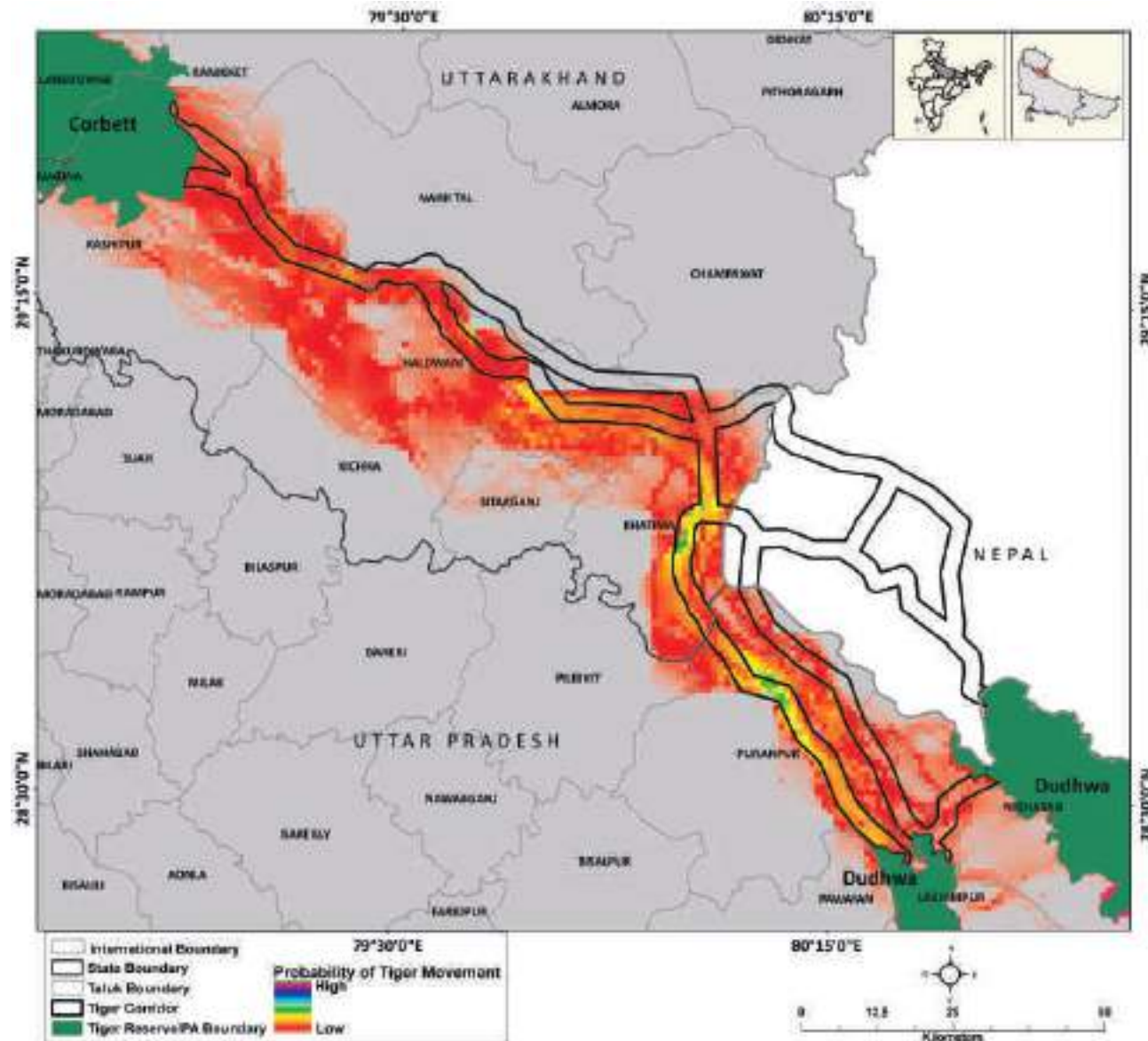
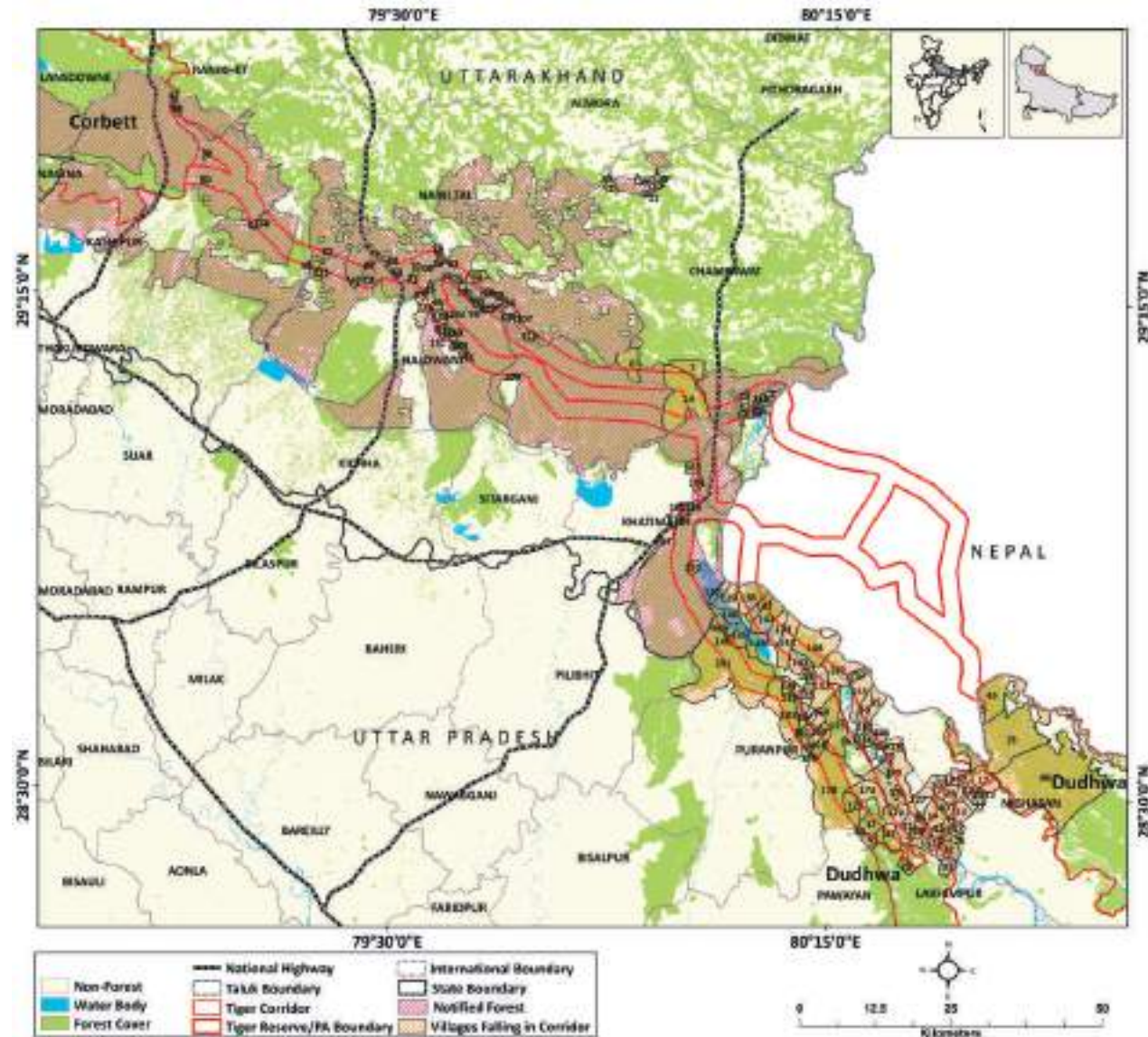


Figure 1.7:
Potential habitat connectivity for tiger movement between Corbett-Dudhwa as depicted by CIRCUITSCAPE model



Figure 1.8:

Least Cost Pathway corridor for Tiger movement between Corbett-Dudhwa overlaid with village map (the village numbers are referenced in Table 1.2)



Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Uttarakhand	Champawat	Champawat	Devidhura (dechmar)	172	691	NA	NA
2			Champawat	Sagaun	46	267	46	265
3			Champawat	Kapherti	16	76	NA	NA
4			Champawat	Timla Guth	30	169	42	218
5			Champawat	Kumaiya Guth	8	52	NA	NA
6			Champawat	Bungra Dungra Pipal	10	88	15	88
7			Champawat	Buram	53	296	60	351
8			Champawat	Kotna	39	215	55	277
9			Champawat	Amauli	91	465	100	608
10			Champawat	Dungra Kot	68	333	71	405
11			Champawat	Gegi Bashan	25	148	NA	NA
12			Champawat	Kanikot	149	834	192	1058
13			Champawat	Bans Balwari	104	542	NA	NA
14			Champawat	Sharda Range	NA	NA	NA	NA
15	Uttar Pradesh	Kheri	Nighasan	Sureya Para	93	864	133	1124
16			Nighasan	Pateda	4	18	3	18
17			Nighasan	Ghola	365	2416	497	2913
18			Nighasan	Visen Puri Colony	354	2443	575	3033
19			Nighasan	Bahadur Nagar	51	307	68	350
20			Nighasan	Bhasuri	82	474	113	530
21			Nighasan	Tulli	13	50	15	63
22			Nighasan	Ebrahim Puri Colony	323	2431	558	2993
23			Nighasan	Vikram Van	62	475	73	399
24			Nighasan	Gadeneya	423	2417	560	3585
25			Nighasan	Suhela	3	11	1	1
26			Nighasan	Badaiya Khera	28	143	29	172
27			Nighasan	Paduwa	291	1746	425	2209
28			Gola Gokaran Nath	Kisunpur	162	1112	261	1335
29			Nighasan	Niranjan Pur	NA	NA	NA	NA
30			Nighasan	Madan Pur	NA	NA	NA	NA
31			Gola Gokaran Nath	Khamaria	NA	NA	NA	NA
32			Gola Gokaran Nath	Newasi	NA	NA	NA	NA



Table 1.2:

Villages within the Least Cost Pathway Corridor between Corbett-Dudhwa as shown in Fig. 1.8

Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
33			Gola Gokaran Nath	Girda	NA	NA	NA	NA
34			Nighasan	Paras Pur	89	498	432	1854
35			Nighasan	Bhan Puri Colony	632	4637	858	5325
36			Nighasan	Govind Naga Colony	356	2799	365	2245
37			Gola Gokaran Nath	Ellenganj	147	903	227	1090
38			Nighasan	Bajpur	81	421	108	497
39			Nighasan	Bam Nagar	173	964	213	1089
40			Nighasan	Mahag Pur	270	1707	438	2277
41			Nighasan	Lagdahan	200	1182	249	1438
42			Gola Gokaran Nath	Canp	184	1149	412	2200
43			Gola Gokaran Nath	Grantno 1	165	969	75	333
44			Gola Gokaran Nath	Pasiyan Pur	NA	NA	NA	NA
45			Nighasan	Gori Fanta	NA	NA	NA	NA
46			Nighasan	Dudhauwa	NA	NA	NA	NA
47	Uttarakhand	Nainital	Haldwani	Chukam	63	314	84	444
48			Haldwani	Dhikuli	198	1020	269	1344
49			Haldwani	Ladwachaur	86	467	118	623
50			Haldwani	Neripura	8	46	10	58
51			Nainital	Kheraula Pandey	40	251	43	225
52			Haldwani	Laduwarao	7	37	1	8
53			Haldwani	Pauvalgarh	137	751	177	960
54			Haldwani	Mankandpur	181	967	192	943
55			Haldwani	Harisinghpur Urf Lachchhampur	7	34	9	51
56			Nainital	Baniya	17	95	27	191
57			Nainital	Moti Bang	5	17	4	17
58			Nainital	Harinagar Chanddeva	39	238	40	256
59			Nainital	Salri	89	488	102	546
60			Dhari	Bhauvasa	114	580	119	680
61			Haldwani	Chhoti Haldwani	102	531	148	779
62			Nainital	Anrori	7	32	5	27
63			Nainital	Purani Haat	25	133	31	162

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
64			Haldwani	Basani	121	616	131	684
65			Nainital	Duhra	30	161	31	178
66			Nainital	Amritpur	417	1922	350	1480
67			Nainital	Amiya	101	535	118	598
68			Nainital	Hairi	23	132	20	113
69			Nainital	Ranibagh	387	1918	463	2066
70			Nainital	Balueti	7	39	27	147
71			Haldwani	Chausala	46	287	73	362
72			Haldwani	Meetha Anwala	29	161	37	197
73			Nainital	Bhadueni	32	174	39	181
74			Nainital	Pasauli	86	488	107	539
75			Nainital	Rausil	166	952	196	996
76			Haldwani	Harigarh Dalipsingh	92	472	150	697
77			Nainital	Gumalgaon	27	189	31	183
78			Haldwani	Beora	85	418	NA	NA
79			Haldwani	Korta	30	120	13	39
80			Haldwani	Damua Dhunga Bandobasti	249	1232	NA	NA
81			Nainital	Mursele	13	75	15	89
82			Nainital	Baret Talla	27	133	38	216
83			Haldwani	Dewala Talla	142	850	188	1004
84			Nainital	Paniya Mahtar	37	239	43	244
85			Haldwani	Damua Dhunga Kham	254	1291	121	565
86			Dhari	Pashtola	59	350	73	401
87			Haldwani	Bamori Malli	490	2283	874	3751
88			Nainital	Paniya Bor	21	112	22	115
89			Nainital	Sirori	16	96	16	79
90			Dhari	Baura	2	11	NA	NA
91			Nainital	Khamari	18	100	14	71
92			Nainital	Ganrar	7	46	6	53
93			Dhari	Uduwa	46	331	53	399
94			Nainital	Okhal Dunga	62	350	59	332





Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
95			Haldwani	Khera	438	2671	688	3589
96			Nainital	Murkariya	97	619	95	600
97			Nainital	Dungsira	4	21	7	35
98			Nainital	Dida	7	42	7	37
99			Nainital	Gaga	30	185	21	137
100			Haldwani	Nawar Khera	175	1108	259	1398
101			Nainital	Baret Malla	26	157	16	107
102			Haldwani	Kishan Nagri	25	124	44	230
103			Nainital	Suera	50	302	58	352
104			Haldwani	Vijaipur	38	278	68	353
105			Dhari	Kaunta	92	528	85	476
106			Haldwani	Dewala Malla	94	565	153	804
107			Dhari	Patrani	93	653	112	799
108			Haldwani	Dewalamalla Simlar	26	159	33	154
109			Haldwani	Dewla Talla Pajaya	84	467	91	563
110			Haldwani	Nayagaon Sambal	60	356	67	333
111			Haldwani	Kunwarpur	90	529	122	699
112			Haldwani	Himmatpur Nakayal	35	197	67	317
113			Haldwani	Gajepur	35	236	63	327
114			Haldwani	Nayagaon Mehra	45	271	57	322
115			Dhari	Kakore	112	741	141	895
116			Haldwani	Lachhampur	173	1016	220	1196
117			Haldwani	Selabhawar Triloksingh	29	138	31	163
118			Haldwani	Himmatpur Golapar	28	171	37	214
119			Haldwani	Jwala Pokhri	38	240	45	247
120			Haldwani	Lakhanpur	36	211	50	251
121			Haldwani	Kishanpur Rekwai	75	454	72	409
122			Haldwani	Kaladhungi	NA	NA	NA	NA
123			Haldwani	Haldwani-Cum-Kathgodam	NA	NA	NA	NA
124			Haldwani	Daulatpur	25	163	37	196
125			Haldwani	Sundarpur Rekwai	42	239	45	240

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
126			Haldwani	Gangapur	22	164	32	226
127			Haldwani	Jeetpur Rekwai	25	177	34	189
128			Haldwani	Padampur Rekuni	24	172	30	169
129			Haldwani	Devpur Pokhriya	29	182	46	220
130			Haldwani	Lakhan Mandi	110	581	133	687
131			Haldwani	Malla Pachauliya	90	454	113	545
132	Uttar Pradesh	Pilibhit	Puranpur	Majhara Bagha	60	415	61	462
133			Puranpur	Ramnagra	195	1083	207	991
134			Puranpur	Dhakia T. Maharajpur	207	1131	148	898
135			Puranpur	Kanjia Singhpur Bhatia	247	1312	270	1440
136			Puranpur	Selha	348	1942	409	2285
137			Puranpur	Bandarbojh	184	1018	219	1349
138			Puranpur	Naujalha Naktaha	569	3570	743	3843
139			Puranpur	Bodi Bhoor	284	2018	415	2564
140			Puranpur	Maharajpur	511	3101	637	3390
141			Puranpur	Lagabhaga	3	7	1	96
142			Puranpur	Bhoora Gorakh Dibbi	111	693	117	668
143			Puranpur	Nagria Khurd Kalan	187	948	217	1121
144			Puranpur	Gunhan	18	96	8	30
145			Puranpur	Manpur Tilhar	NA	NA	NA	NA
146			Puranpur	Dhar Bargada	NA	NA	NA	NA
147			Puranpur	Bijauri Khurd Kalan	7	39	4	23
148			Puranpur	Bharari	10	51	12	68
149			Puranpur	Murainia Gandhi Nagar	241	1696	363	2242
150			Puranpur	Bamanpura Bhagirath	525	3042	873	4520
151			Puranpur	Majhara T.maharajpur	164	1082	173	1169
152			Puranpur	Birkhera T. Maharajpur	NA	NA	NA	NA
153			Puranpur	Sungarhi	NA	NA	NA	NA
154			Puranpur	Chandpura Tarai	NA	NA	NA	NA
155			Puranpur	Bailaha	593	3286	310	1554
156			Puranpur	Ramkot	30	173	75	420
157			Puranpur	Pachpera T. Maharajpur	109	753	175	977





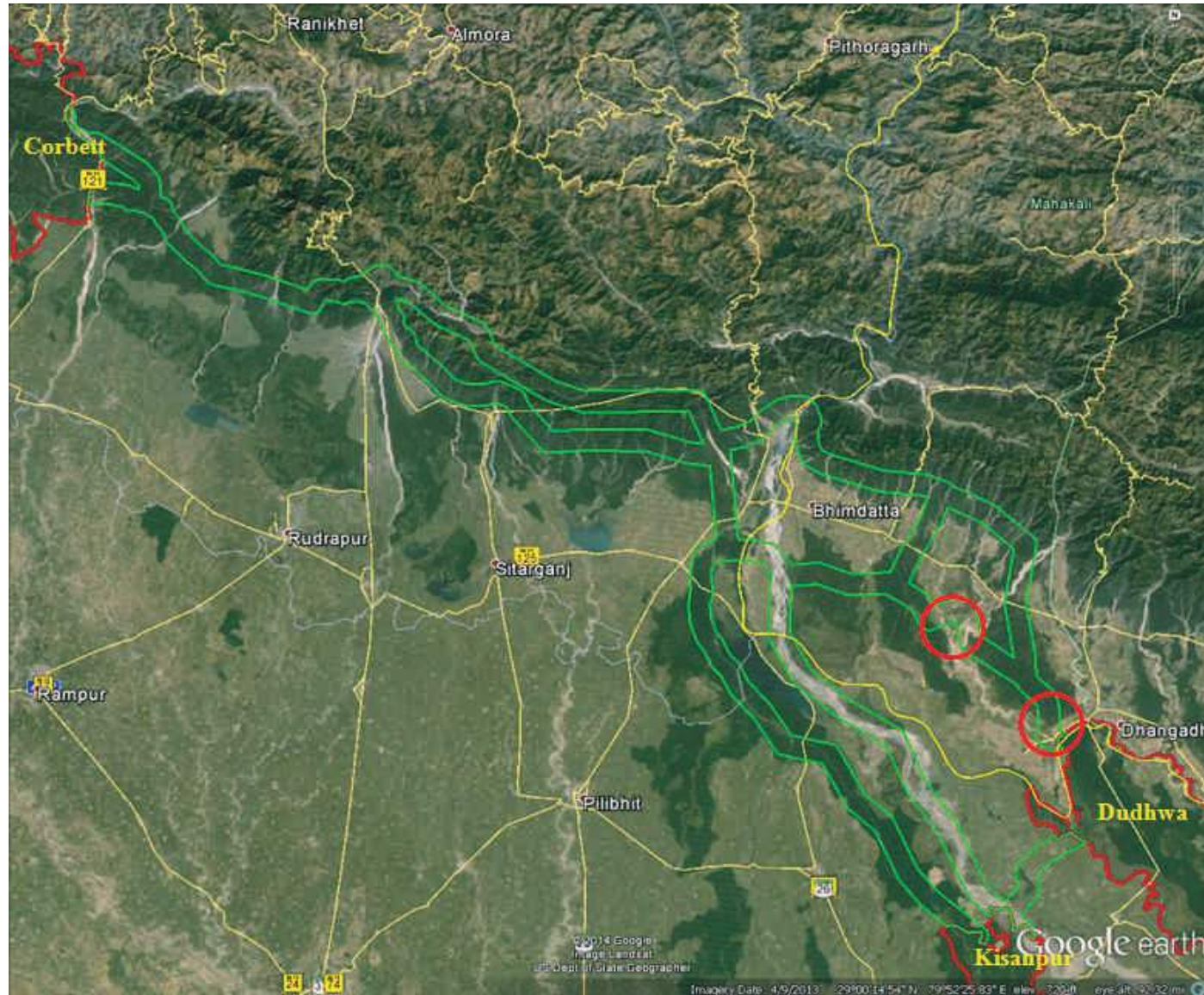
Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
158			Puranpur	Rajpur T. Maharajpur	141	825	210	1129
159			Puranpur	Simra T. Maharajpur	138	744	167	943
160			Puranpur	Fajjullaganj	68	479	144	797
161			Puranpur	Maini Gulria	83	513	103	528
162			Puranpur	Shastri Nagar	161	1066	150	901
163			Puranpur	Barua Kuthara	46	346	87	485
164			Puranpur	Laihari	64	402	87	451
165			Puranpur	Ashok Nagar	169	1041	272	1319
166			Puranpur	Bharatpur	431	2863	513	2859
167			Puranpur	Siddhnagar	221	1545	198	1150
168			Puranpur	Chandia Hajara	1363	7360	1590	8477
169			Puranpur	Katakware	NA	NA	NA	NA
170			Puranpur	Musepur	18	176	35	209
171			Puranpur	Shanti Nagar	205	1371	257	1684
172			Puranpur	Ramnagar	565	3986	728	4912
173			Puranpur	Khirkia Bargadia	328	1624	216	1324
174			Puranpur	Kabeerganj	715	4248	910	4801
175			Puranpur	Azad Nagar	1	5	1	1
176			Puranpur	Grant No21 Urf Dhakkachat	469	2789	620	3678
177			Puranpur	Kuthia Gudia	228	1468	349	1785
178			Puranpur	Harrapur	NA	NA	NA	NA
179			Puranpur	Nehrosa	415	2648	520	3203
180			Puranpur	Bharara	NA	NA	NA	NA
181			Puranpur	Mustafabad	NA	NA	NA	NA
182			Puranpur	Sampurn Nagar	NA	NA	NA	NA
183			Puranpur	Barahi	NA	NA	NA	NA
184	Uttarakhand	Udham Singh Nagar	Khatima	Jhan Kaieya	287	1581	503	2724
185			Khatima	Khetal Sanda Mustnagar	463	2703	586	2949
186			Khatima	Bilheeri	491	2632	NA	NA
187			Khatima	Unchi Mahuwar	251	1540	439	2308

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
188			Khatima	Gosu Kuwan	167	1064	NA	NA
189			Khatima	Mudai	318	1898	NA	NA
190			Khatima	Amaun	851	4299	1544	7233
191			Khatima	Sarada Sagar Jhau Parasa	42	256	65	324



Figure 1.9:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Corbett-Dudhwa



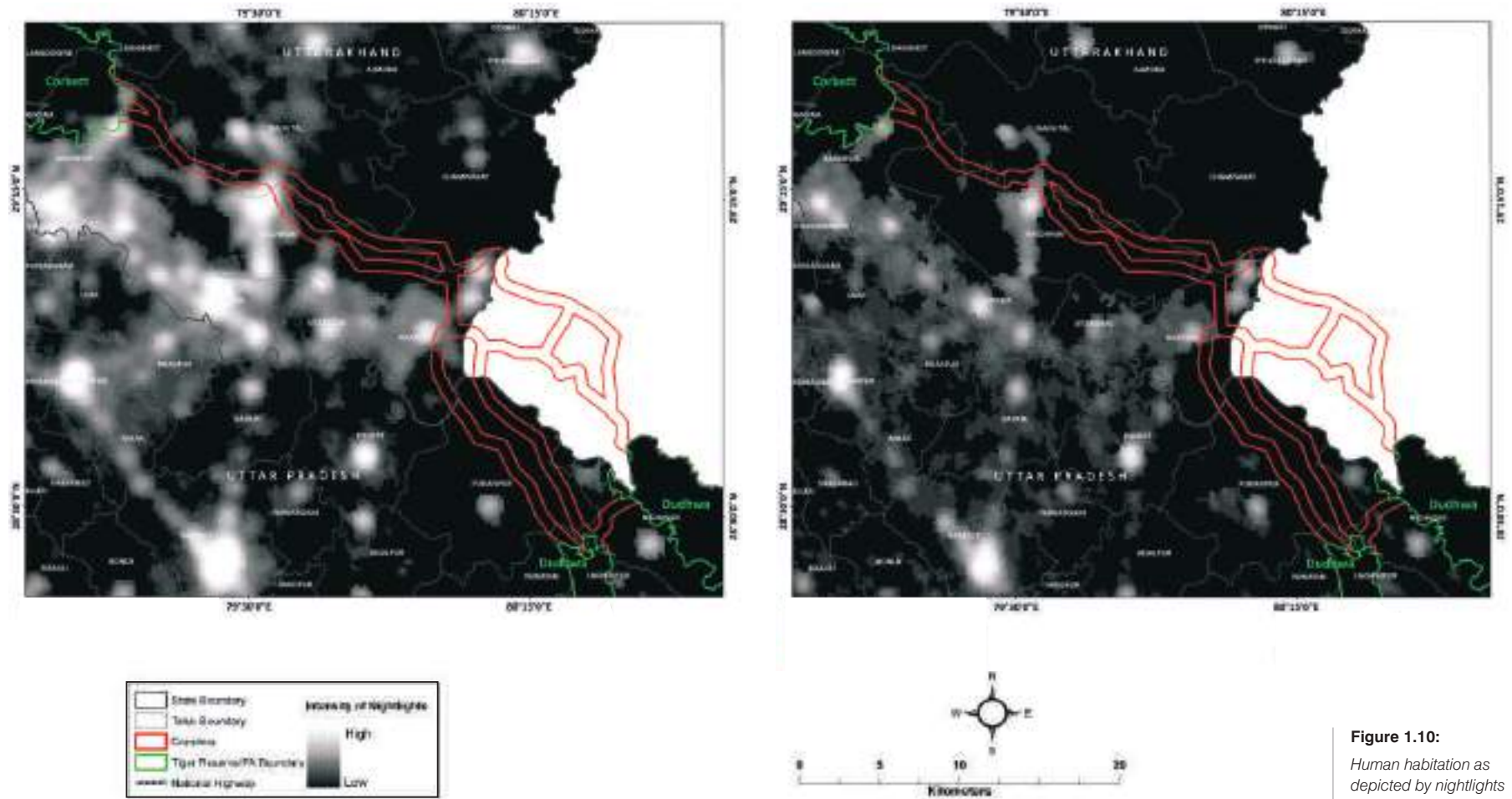


Figure 1.10:
Human habitation as depicted by nightlights within the Corbett-Dudhwa landscape in the year 1992 and 2012

DUDHWA-KISHANPUR-KATARNIAGHAT

Figure 1.11:

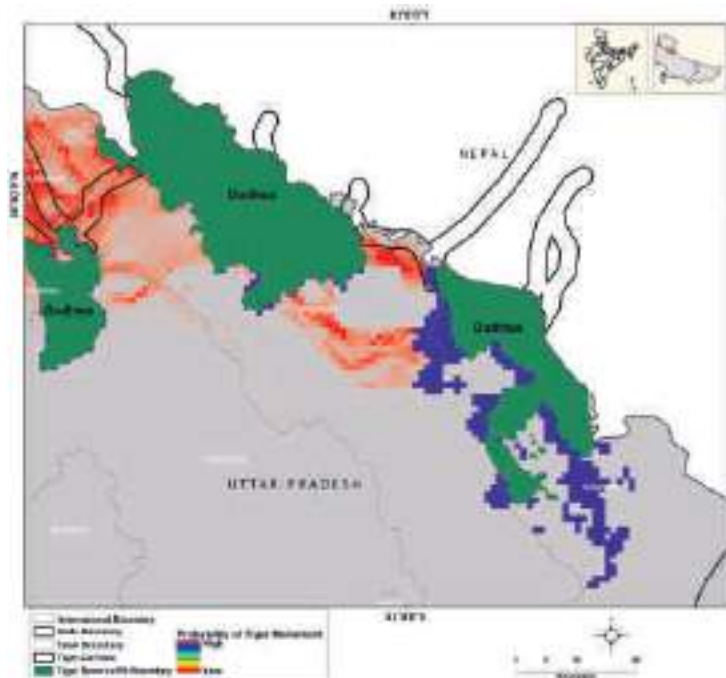
Potential habitat connectivity for tiger movement between Dudhwa-Kishanpur-Katarniaghat as depicted by CIRCUITSCAPE model

The connectivity between Dudhwa-Kishanpur Wildlife Sanctuary and River Sharda is highly fragmented with oxbow lakes and forest fragments in a primarily agricultural matrix (sugarcane). To the north, it is connected to the Churia hill forests of Nepal through a riverine corridor while to the west river channels and forest patches connect it to Suklaphanta. River Mohana acts as a corridor connecting Dudhwa to Katarniaghat in the east and to Bardia National Park of Nepal in the north.

The Dudhwa-Katarniaghat corridor along River Mohana has been greatly deforested and needs to be restored to allow movement of wildlife. The other important corridors in this region, essential for movement of animals between Nepal and India are the Basantha and Khata corridors. The Khata corridor along River Girwa also connects Katarniaghat to Bardia and is often used by elephants, tigers, and rhinos. The river channels in this landscape are also a conduit for the movement of gharials, crocodiles and Gangetic dolphins.

While connectivity between Dudhwa-Katarniaghat-Suhelwa and Sohagibarwa on the Indian side is almost non-existent, forests along the Nepal terai connect these areas.

The other important forested area in the State is Pilibhit Tiger Reserve which is connected to the Corbett Tiger Reserve in the north-west by the Surai Range and to Suklaphanta National Park in Nepal to the north-east via forests of Lagga-Bagga. It forms a continuous narrow corridor along the Sharda canal that stretches south-east into Kishanpur Wildlife Sanctuary. This corridor is well used by tigers forming a contiguous population from Surai Range in Uttarakhand to Pilibhit and Kishanpur.



Dudhwa-Katarniaghat

Habitat size	24792 Km ²
Source Population	Dudhwa and Katarniaghat
Size of Source	106-118 (Dudhwa-Kheri-Pilibhit)
Protected Areas	Dudhwa Kishanpur Katarniaghat
Corridors	Dudhwa-Katarniaghat

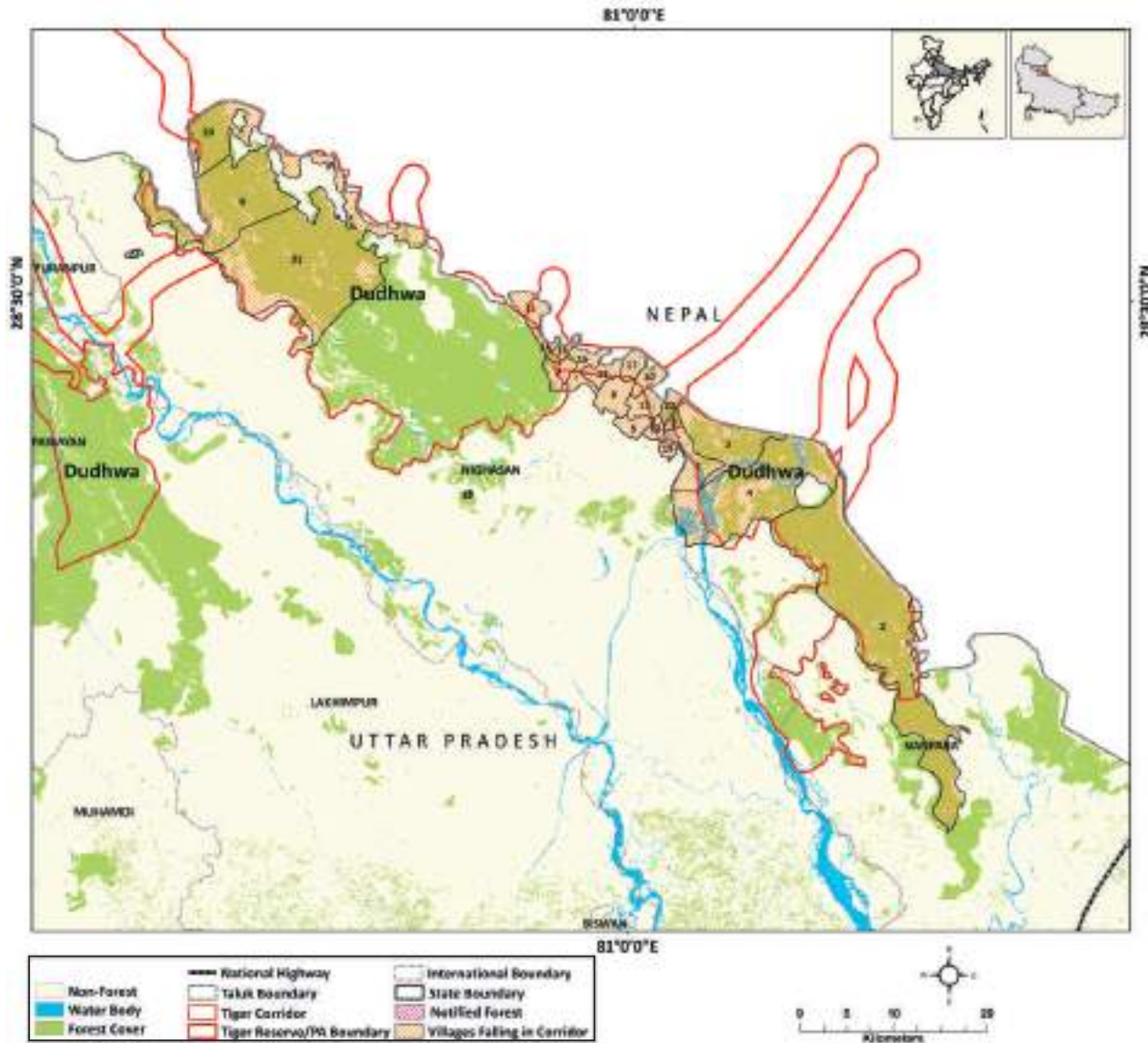


Figure 1.12: Least Cost Pathway corridor for Tiger movement between Dudhwa-Kishanpur-Katamiaghat overlaid by village map (the village numbers are referenced in Table 1.3)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1		Bahraich	Nanpara	Bharthapur	75	441	94	490
2				Motipur Range	43	106	0	0
3				Bandariya Gauri No.1	0	0	0	0
4				Charda Range	0	0	0	0
5				Bandariya Gauri No.2	0	0	0	0
6				Sureya Para	93	864	133	1124
7				Kadeya	451	2412	611	2924
8				Banveer Pur	668	4297	1101	5578
9				Barsola Kalan	744	4142	1141	6172
10				Indra Nagar	67	484	165	804
11				Bela Parsuwa	498	3247	709	4848
12				Ram Nagar Sankalpa	117	727	19	89
13				Surat Nagar	380	2528	729	3812
14				Raghu Nagar	43	277	79	488
15				Kisun Nagar	48	284	59	406
16				Deep Nagar	89	510	87	453
17				Ran Nagar	215	1207	283	1499
18				Ganga Nagar	225	1319	288	1599
19				Anup Nagar	67	353	19	90
20				Gori Fanta	0	0	0	0
21				Dudhauwa	0	0	0	0
22	Uttar Pradesh	Kheri	Nanpara		0	0	0	0

Table 1.3:

Villages within the Least Cost Pathway Corridor between Corbett-Dudhwa as shown in Fig. 1.12



Figure 1.13:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Dudhwa-Kisanpur-Katarniyaghat



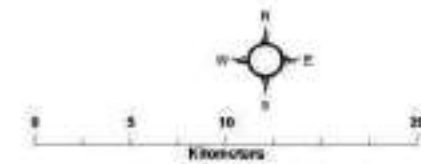
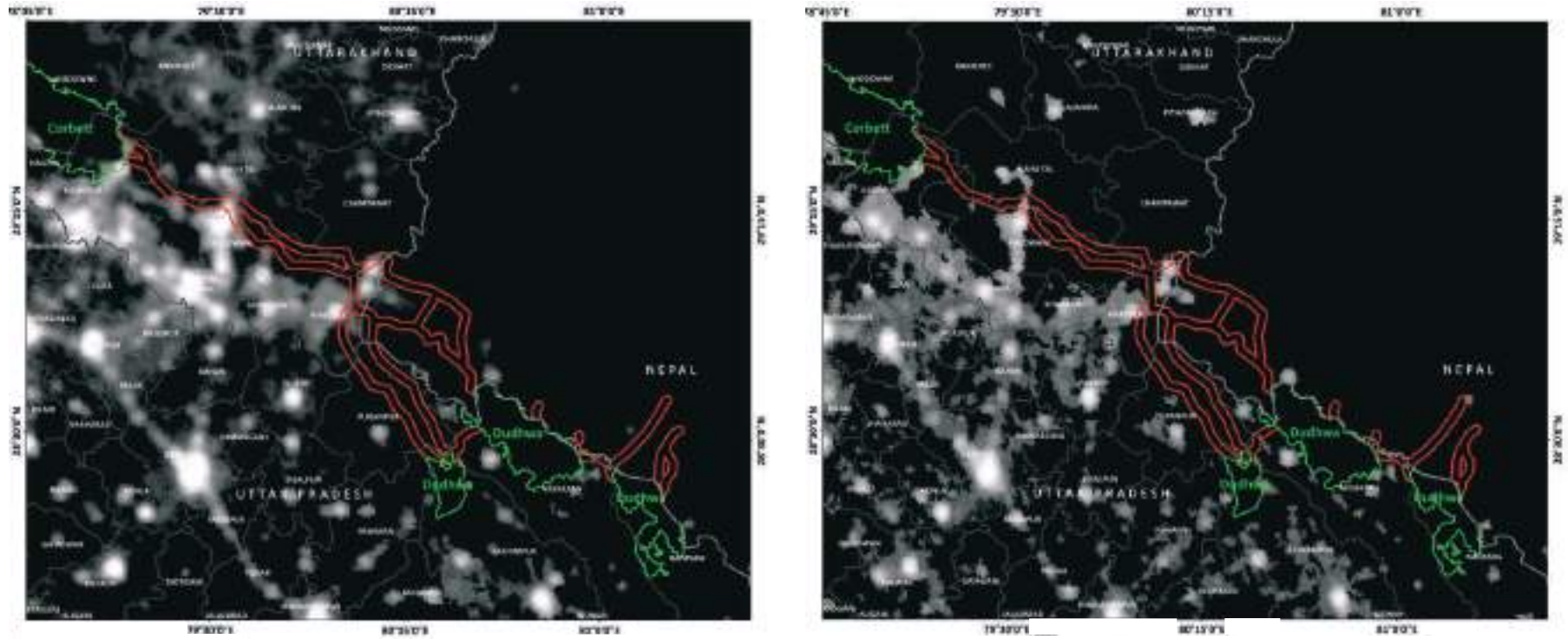


Figure 1.14:
Human habitation as depicted by nightlights within the Dudhwa-Kishanpur-Katarniaghat Corridor landscape in the year 1992 and 2012



CENTRAL INDIAN LANDSCAPE AND EASTERN GHATS



2

CENTRAL INDIAN LANDSCAPE AND EASTERN GHATS

The Central Indian Landscape encompasses a large land mass covering Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and parts of Andhra Pradesh. The landscape harbors about 601 number of tigers in 19 tiger reserves and several other protected areas.

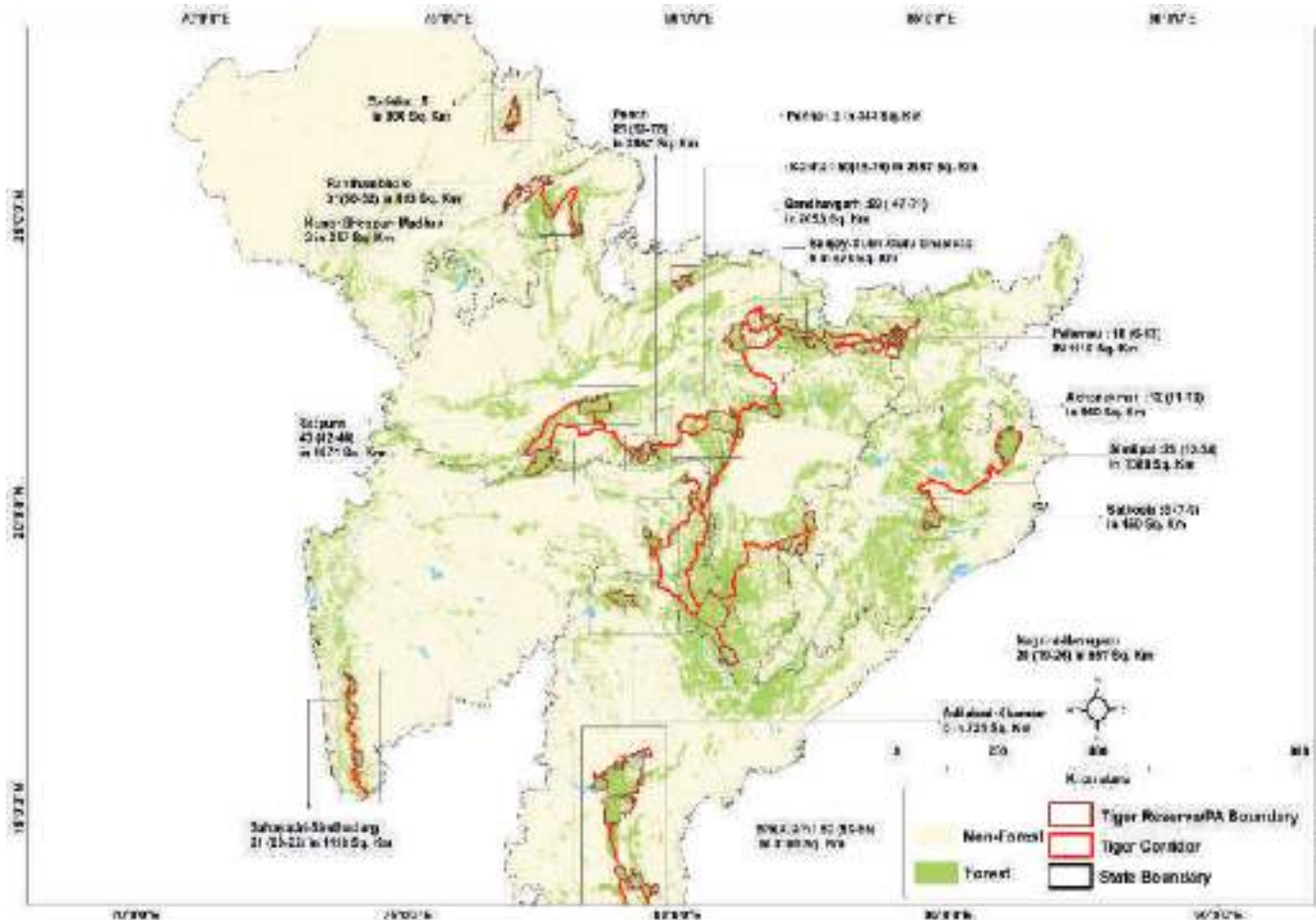
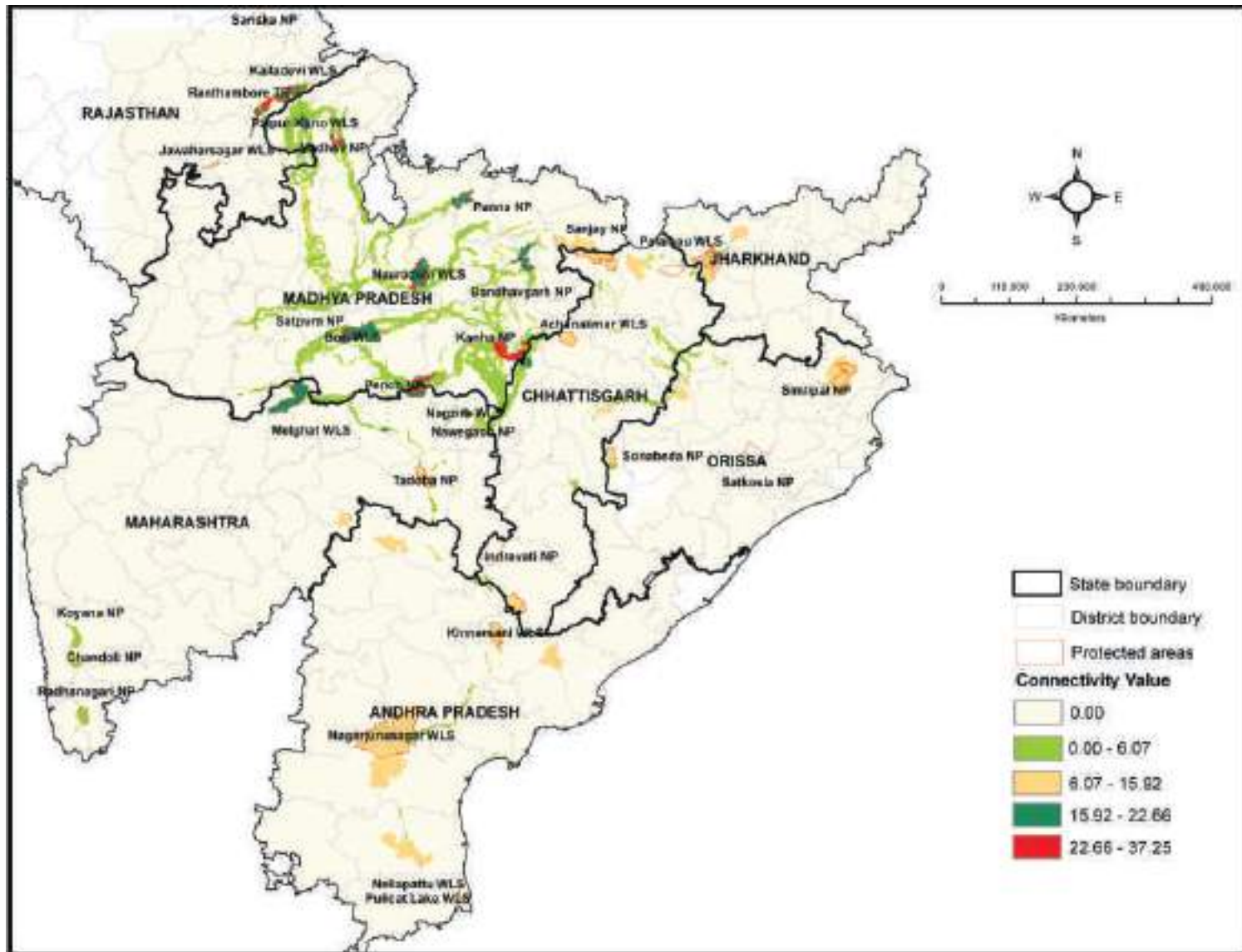


Figure 2.1:
Tiger Populations and Corridors of Central India



Figure 2.2:

Map showing Landscape connectivity in Central India modeled Using CIRCUITSCAPE



CORRIDORS OF CENTRAL INDIAN LANDSCAPE

RANTHAMBORE-KUNO-MADHAV NATIONAL PARK

The only source of tigers in this landscape is Ranthambore NP. Kailadevi, Kuno, Shivpur forest, Madhav National Park (NP) and Mukundra Hills Tiger Reserve (TR) are currently sink habitats. Given the size of this landscape with good habitat the region holds promise for future increase in tiger occupancy and numbers. This enhancement can happen only if the connecting corridors mentioned herein remain intact and functional. The crucial elements which need special attention are 1) curbing of development along the banks of the river Chambal especially protecting forest patches that are on the river banks. 2) a pinch point in the corridor is where highway number SH-23 crosses the river Kuno. This area needs attention and mitigation in the form of smart green infrastructure so that the road, railway and canal system along with urban sprawl does not become a barrier to wildlife movement. 3) Revitalization of Kailadevi WLS by relocation of villages, reduction of livestock and enhancement of prey would enhance the importance of Ranthambore TR as a source and increase the carrying capacity of the region for tigers. Kailadevi would also serve as staging ground for dispersal eastwards into Shivpur.

Ranthambore-Kuno-Shivpuri-Madhav

Habitat size	9173 Km ²
Source Population	Ranthambore Tiger Reserve
Size of Source	30-32
Protected Areas	Ranthambore Kuno-Shivpuri WLS Madhav NP
Corridors	Ranthambore-Kuno Kuno-Madhav Ranthambore-Mukundhara Hills

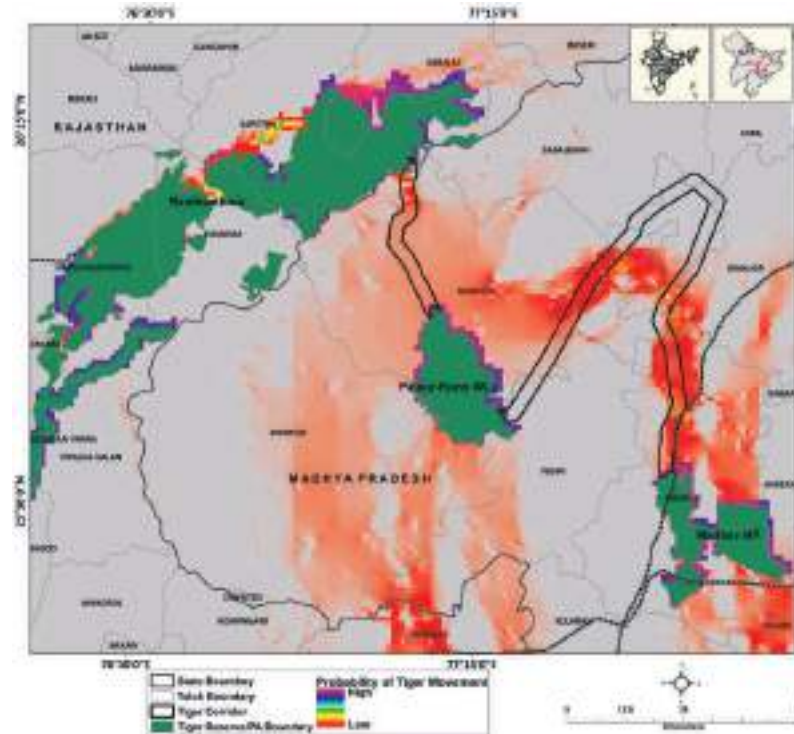


Figure 2.3:
Potential habitat connectivity for tiger movement between Ranthambore-Kuno-Madhav National Park as depicted by CIRCUITSCAPE model

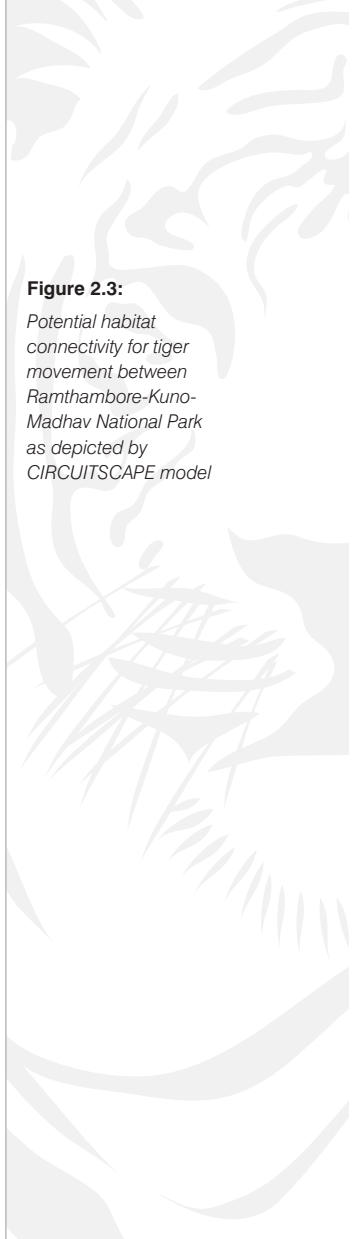
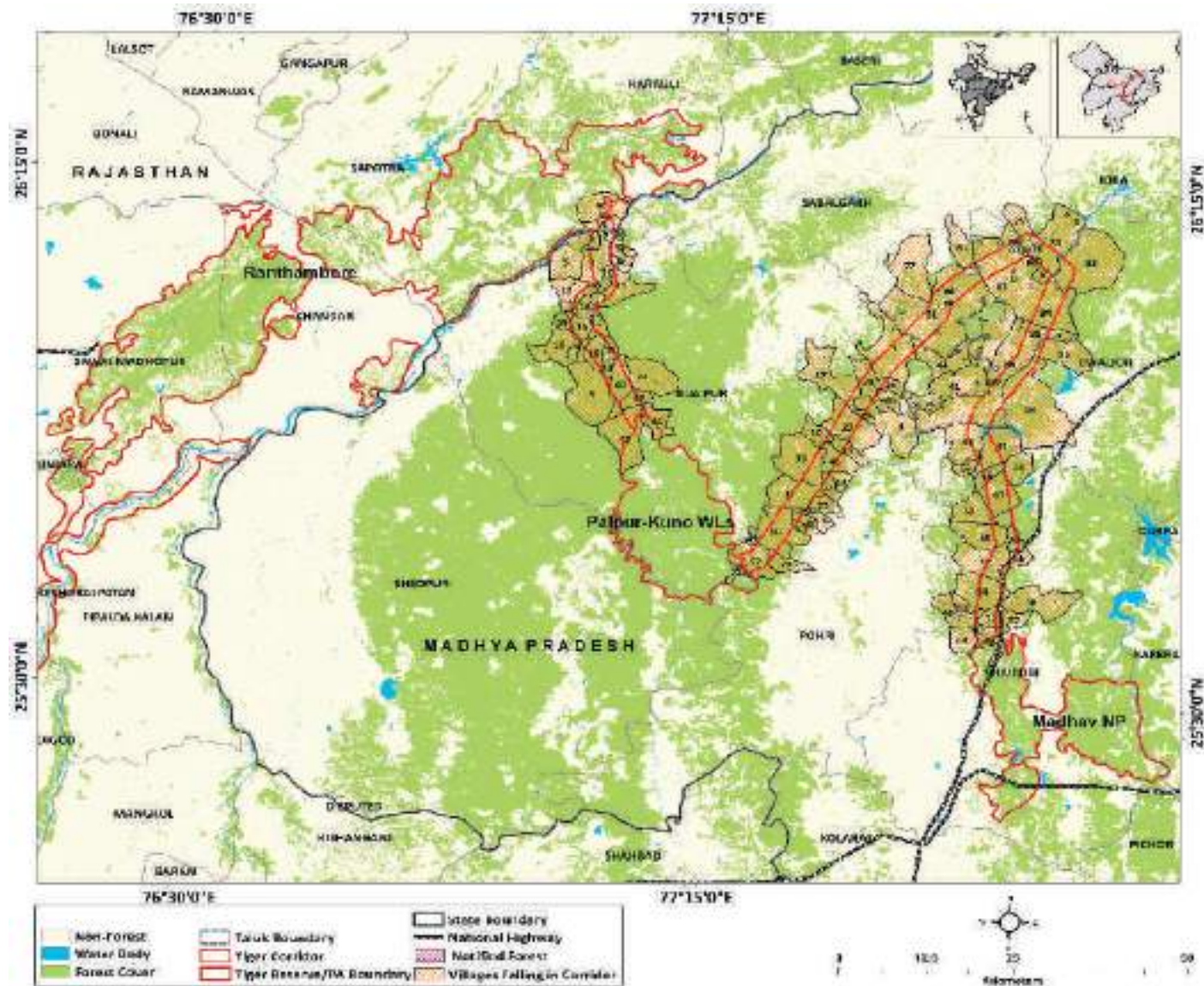


Figure 2.4:

Least Cost Pathway corridor for Tiger movement between Ranthambore-Kuno-Madhav National Park overlaid with village map (the village numbers are referenced in Table 1.1)



Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Madhya Pradesh	Sheopur	Vijaypur	Jimarchha	173	1348	326	1713
2			Vijaypur	Harkul	140	824	204	891
3			Vijaypur	Badagaon	271	1654	523	2102
4			Vijaypur	Dhobini	90	500	126	587
5			Vijaypur	Syarda	337	2100	614	2912
6			Vijaypur	Gohar	280	1851	509	2205
7			Vijaypur	Gaswani	577	3410	937	4038
8			Vijaypur	Nitanwas (bijaiapur)	282	1580	443	2009
9			Vijaypur	Silpari	NA	NA	NA	NA
10			Vijaypur	Pancho	527	3097	919	3731
11			Vijaypur	Birpur	783	4920	1352	6165
12			Vijaypur	Nadigaon	240	1764	450	2221
13			Vijaypur	Milawali	124	673	199	819
14			Vijaypur	Kheroda Khurd	73	516	110	587
15			Vijaypur	Kheroda Kalan	103	545	179	709
16			Vijaypur	Sudhara	292	1541	493	1964
17			Vijaypur	Baroda Khurd	71	469	155	607
18			Vijaypur	Basantpura	50	195	NA	NA
19			Vijaypur	Lakshamanpura (dhodar)	32	203	55	272
20			Vijaypur	Binega	55	343	101	485
21			Vijaypur	Kinnapura	94	775	231	1114
22			Vijaypur	Rawatpura	65	346	98	419
23			Vijaypur	Kishanpura	48	284	345	1574
24			Vijaypur	Mahuamar	72	472	115	586
25			Vijaypur	Sehula	75	458	132	559
26			Vijaypur	Khurka	105	628	154	698
27			Vijaypur	Enta	65	477	128	613
28			Vijaypur	Hullpur	238	1548	335	1667
29			Vijaypur	Sarangpur	172	1004	275	1201
30			Vijaypur	Dongarpur (gaswani)	83	487	121	574
31			Vijaypur	Paira	165	806	NA	NA
32			Vijaypur	Raghunathpur	759	4760	1131	5621



Table 2.1:
Villages within the Least
Cost Pathway Corridor
between Ranthambore-
Kuno-Madhav National
Park as shown in
Fig.2.4

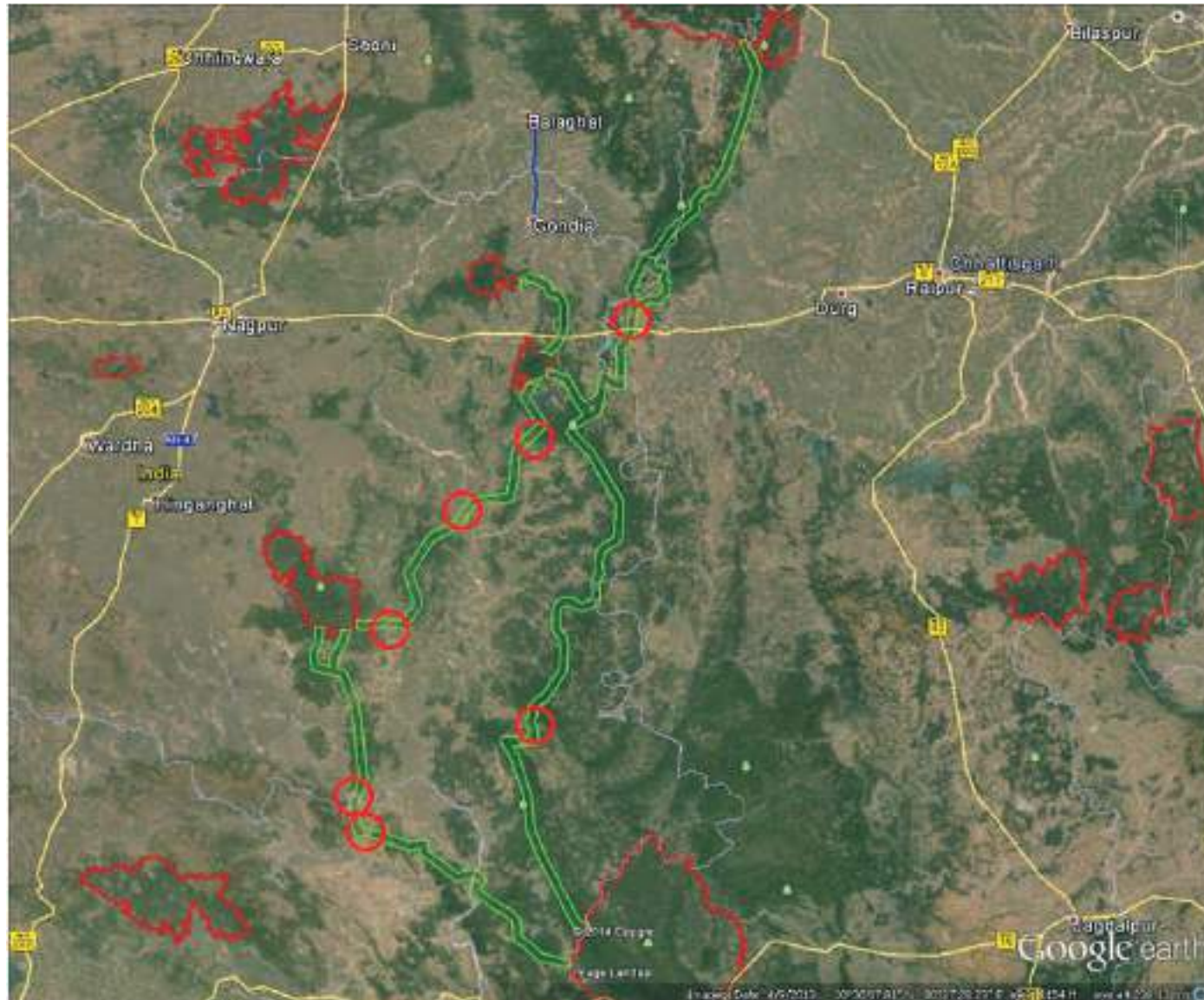
Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
33			Vijaypur	Sumrera	503	3030	814	3568
34			Vijaypur	Kathon	391	2537	690	3035
35			Vijaypur	Khadi F.2	95	771	131	676
36			Vijaypur	Amarpura	NA	NA	NA	NA
37			Vijaypur	Lalaiyapura	NA	NA	NA	NA
38			Vijaypur	Deopur	NA	NA	NA	NA
39			Vijaypur	Imalia	NA	NA	NA	NA
40			Vijaypur	Ransinghpura	NA	NA	NA	NA
41			Vijaypur	Tadawali	NA	NA	NA	NA
42			Vijaypur	Todi	NA	NA	NA	NA
43			Vijaypur	Gilai	NA	NA	NA	NA
44			Vijaypur	Arrodari	299	1779	512	2217
45		Shivpuri	Pohari	Bhilodi	182	1120	320	1416
46			Pohari	Umari	78	460	153	579
47			Pohari	Basai	36	191	90	373
48			Pohari	Gohara	50	262	74	357
49			Shivpuri	Nirman	76	536	172	764
50			Pohari	Raiyan	100	611	185	750
51			Pohari	Raghunathpura	26	151	53	204
52			Shivpuri	Karyara	10	62	12	41
53			Pohari	Kemai	142	795	222	968
54			Shivpuri	Padar Kheda	210	1096	277	1370
55			Shivpuri	Sujiyapura	3	21	7	22
56			Shivpuri	Khanda	9	48	NA	NA
57			Pohari	Beharda	47	264	89	334
58			Shivpuri	Mudkheda Dholagarh	71	418	108	485
59			Shivpuri	Gopalpur	379	2296	507	2815
60			Shivpuri	Khalara	24	127	30	169
61			Shivpuri	Imaliya Gopalpur	33	219	55	284
62			Shivpuri	Bilu Khoh	54	379	89	433
63			Shivpuri	Rampur	11	78	19	99
64			Shivpuri	Jamonia	68	402	109	632

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
65			Pohari	Hanumanta	NA	NA	NA	NA
66			Pohari	Imlipura	NA	NA	NA	NA
67			Shivpuri	Narshingpur F.v 1	NA	NA	NA	NA
68			Pohari	Ummedpura	NA	NA	NA	NA
69			Shivpuri	Golarka	NA	NA	NA	NA
70			Shivpuri	Kansarai F.3	NA	NA	NA	NA
71			Pohari	Godha	NA	NA	NA	NA
72			Shivpuri	Satkiwadi F.4	NA	NA	NA	NA
73			Pohari	Karkhaua	NA	NA	NA	NA
74		Morena	Joura	Baghebar	93	456	126	605
75			Kailaras	Thathipura	229	1377	309	1599
76			Kailaras	Beharara Gagir	343	2042	470	2375
77			Kailaras	Golhari	436	2738	722	3219
78			Joura	Bahrai Upari	26	176	58	221
79			Joura	Jajipura	9	81	30	152
80			Joura	Manpur	98	532	107	622
81			Joura	Pali	7	44	37	227
82			Joura	Birkhapura	37	279	62	351
83			Joura	Ratki	4	37	16	62
84			Joura	Rakehara	40	350	58	482
85			Joura	Jaderu	105	614	183	890
86			Joura	Dhobini	88	494	178	827
87			Joura	Hariyapura	NA	NA	NA	NA
88			Joura	Barai Kote	NA	NA	NA	NA
89			Joura	Umari	NA	NA	NA	NA
90	Rajasthan	Karuali	Sapotra	Kased	331	2370	541	2957
91			Sapotra	Simora	111	920	NA	NA
92	Madhya Pradesh	Gwalior	Grid	Basota	19	135	27	149
93			Grid	Bagwalagaon	76	637	125	700
94			Grid	Badagaonjagir	437	2781	722	3298



Figure 2.5:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Ranthambore-Kuno-Madhav National Park



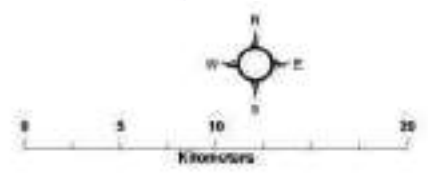
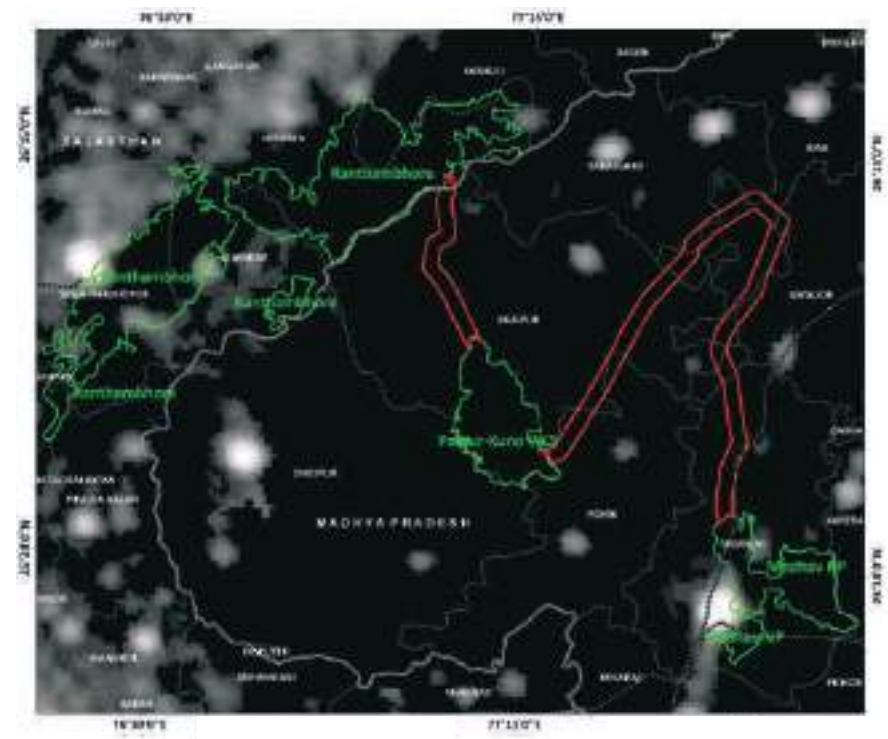
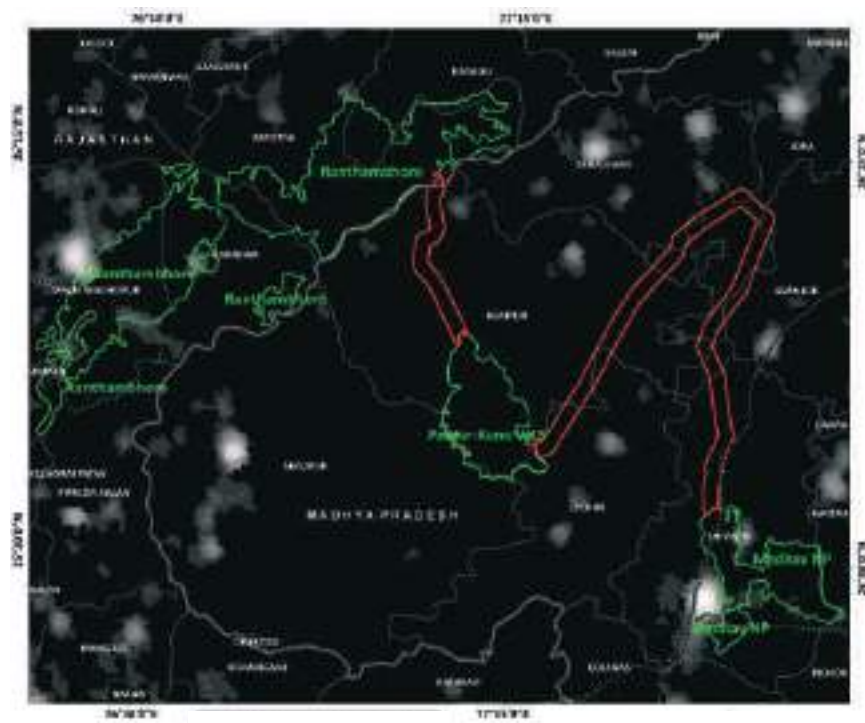


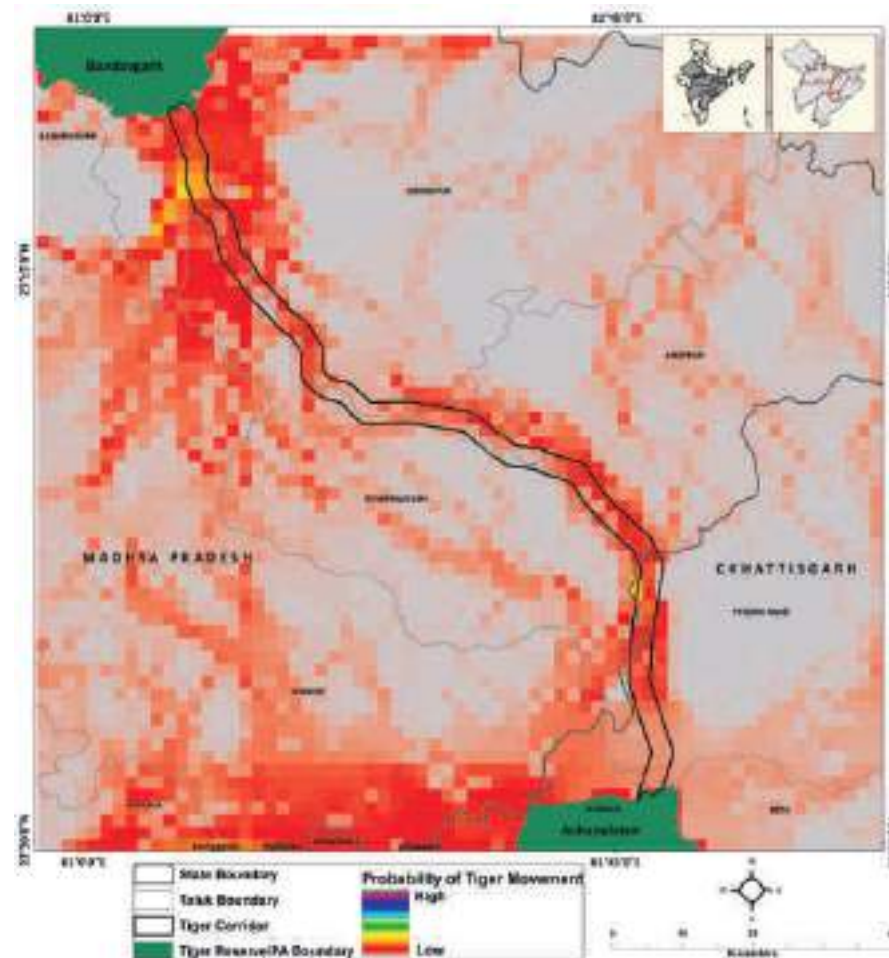
Figure 2.6:
Human habitation as depicted by nightlights within the Ranthambore-Kuno-Madhav National Park Corridor landscape in the year 1992 and 2012

BANDHAVGARH-ACHANAKMAR

Figure 2.7:

Potential habitat connectivity for tiger movement between Bandhavgarh-Achanakmar as depicted by CIRCUITSCAPE model

This corridor connects two very important sub-landscapes, the Kanha-Pench population with Bandhavgarh-Sanjay-Dubri populations. However, the corridor passes through tiger hostile landscape since some communities living in the vicinity are known for their poaching tendencies. The habitat through which the corridor passes is itself narrow ridge-top forest with high biotic pressures. Further, due to availability of coal in this landscape matrix there is ever present pressure from infrastructure development associated with coal mining. This corridor requires serious attention for restoration in terms of ecology as well as socio-economic inputs.



Bandhavgarh-Achanakmar

Habitat size	19111 Sq. Km ²
Source Population	Bandhavgarh Tiger Reserve
Size of Source	47-71
Protected Areas	Bandhavgarh Tiger Reserve Achanakmar Tiger Reserve
Corridors	Achanakmar-Bhandhavgarh

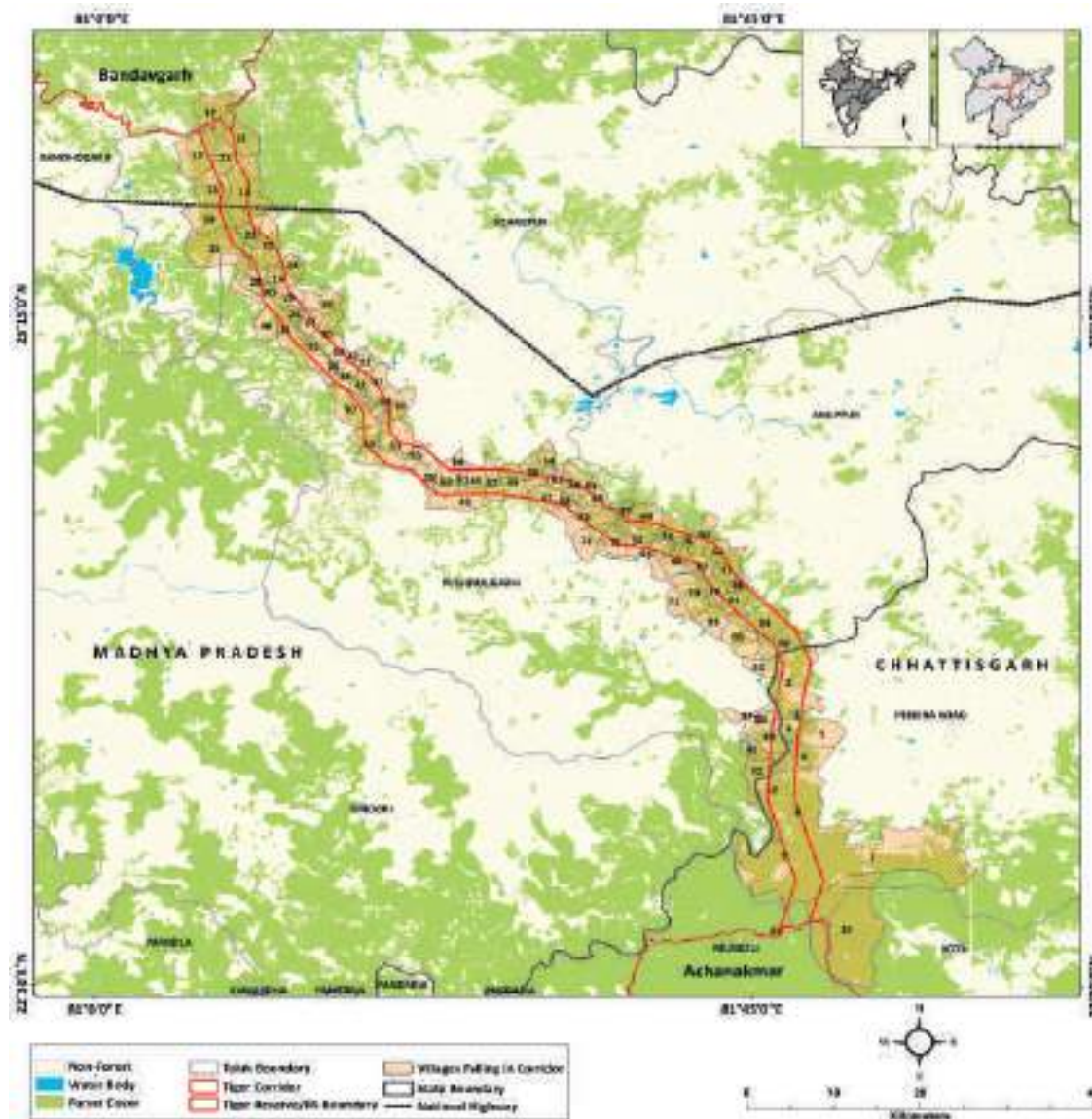


Figure 2.8:
Least Cost Pathway
corridor for Tiger
movement between
Bandhavgarh-
Achanakmar overlaid
with village map (the
village numbers are
referenced in Table 2.2)

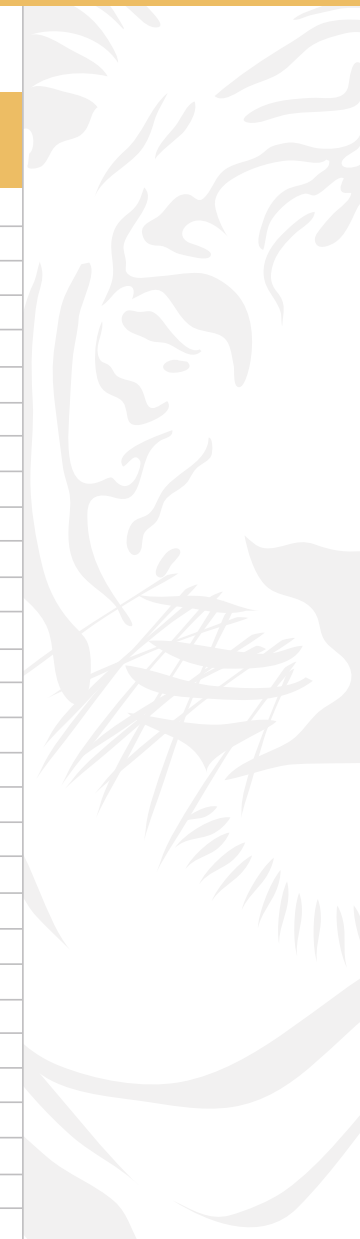


Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Chhattisgarh	Bilaspur	Pendraroad	Tawardabra	87	413	128	476
2			Pendraroad	Salheghori	236	1083	297	1270
3			Pendraroad	Karngara	59	252	133	468
4			Pendraroad	Bedkhadera	34	167	19	66
5			Pendraroad	Jhagra Khand	282	1284	392	1560
6			Pendraroad	Choktipani	260	1272	384	1641
7			Pendraroad	Thengadand	204	924	308	1096
8			Pendraroad	Thandpathra	160	780	239	899
9			Pendraroad	Kewchi	292	1200	423	1470
10			Kota	Tatidhar	297	1185	402	1400
11			Lormi	F.22 Kuba	13	49	NA	NA
12	Madhya Pradesh	Umaria	Bandhogarh	Sans	78	345	98	435
13			Bandhogarh	Parsaura	75	391	101	496
14			Bandhogarh	Jamuhai	102	457	132	548
15			Bandhogarh	Beli	162	770	220	965
16			Bandhogarh	Baghannara	78	386	101	435
17			Bandhogarh	Ramsohara	NA	NA	NA	NA
18			Bandhogarh	Karkati	138	670	160	736
19			Bandhogarh	Raugarh	194	975	238	1048
20			Bandhogarh	Panwari	18	86	23	95
21			Bandhogarh	Mudkatiya	NA	NA	NA	NA
22			Bandhogarh	Ghun Ghuti	412	1880	541	2088
23			Bandhogarh	Githauri	74	388	78	308
24			Bandhogarh	Chandpur	136	653	183	762
25			Bandhogarh	Barhai	147	719	214	853
26			Bandhogarh	Audhera	191	1031	273	1198
27			Bandhogarh	Malachua	228	1182	320	1355
28			Bandhogarh	Kachodar	123	534	165	651
29			Bandhogarh	Amgar	164	781	221	915
30			Bandhogarh	Blackpadri	32	179	57	251

Table 2.2:

Villages Within the Least Cost Pathway Corridor between Bandhavgarh-Achanakmar as shown in Fig. 2.8

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Bandhogarh	Hathpura	179	976	248	1173
32			Bandhogarh	Kusmaha Khurd	138	708	201	874
33		Shahdol	Sohagpur	Khouhal	42	192	60	230
34			Pushparajgarh	Mekal Pahad	NA	NA	NA	NA
35			Sohagpur	Silpari	92	437	119	483
36			Sohagpur	Lamro	147	982	242	1175
37			Sohagpur	Jugwari	300	1502	458	1886
38			Sohagpur	Majhagawan	255	1327	374	1533
39			Sohagpur	Arjhuli	81	435	139	506
40			Pushparajgarh	Kharsol	139	733	175	853
41			Sohagpur	Pachdi	154	716	205	841
42			Sohagpur	Deori Tola	164	812	200	941
43			Sohagpur	Kapildhara	80	354	102	374
44			Sohagpur	Sonaha	104	540	150	674
45			Sohagpur	Mekal Pahad	NA	NA	NA	NA
46			Pushparajgarh	Mekal Pahad	NA	NA	NA	NA
47			Anuppur	Chhira Patpar	26	121	36	160
48			Sohagpur	Bandhawa Bada	340	1627	438	1878
49			Sohagpur	Kelmaniya	373	1678	494	2021
50			Pushparajgarh	Jaitahari	88	484	107	483
51			Sohagpur	Patkhai	323	1551	416	1834
52			Anuppur	Audhera	122	567	147	603
53			Pushparajgarh	Ahircawan	111	589	133	686
54			Sohagpur	Koilaha	77	417	120	558
55			Sohagpur	Bamura	185	843	249	992
56			Sohagpur	Samatpur	275	1403	421	1671
57			Sohagpur	Kathai	57	259	75	318
58			Sohagpur	Turri	124	600	170	656
59			Sohagpur	Amha Tola	144	665	213	876
60			Sohagpur	Kathautiya	306	1406	411	1721



Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
62			Sohagpur	Chhirhati	34	172	47	209
63			Sohagpur	Kodwar Kalan	137	657	199	797
64			Anuppur	Dudhmaniya	128	685	176	779
65			Jaithari	Gaurela	210	949	271	1145
66			Jaithari	Daleddeh	34	160	37	181
67			Pushparajgarh	Padri	124	626	176	714
68			Pushparajgarh	Bilai Kher	25	128	36	162
69			Anuppur	Didwapani	101	543	122	613
70			Jaithari	Thehi	59	313	82	384
71			Pushparajgarh	Girwi	109	525	137	584
72			Sohagpur	Khoh	256	1264	306	1387
73			Anuppur	Akua	168	731	69	322
74			Anuppur	Badhar	120	555	157	678
75			Anuppur	Kirar	55	272	73	303
76			Jaithari	Kholaiya	67	328	120	445
77			Jaithari	Padari	131	588	143	639
78			Jaithari	Chhirpani	27	139	44	175
79			Jaithari	Baihar	184	886	239	1086
80			Jaithari	Behnadawar	95	494	146	665
81			Jaithari	Dodhipani	172	905	241	1012
82			Pushparajgarh	Mekal Pahad	31	152	34	156
83			Jaithari	Khursa	94	429	126	463
84			Jaithari	Padripani	135	728	170	850
85			Jaithari	Bhelma	151	814	164	890
86			Jaithari	Pondi	318	1502	440	1680
87			Pushparajgarh	Tali	135	675	169	822
88			Pushparajgarh	Bharni	102	502	130	608
89			Pushparajgarh	Pamra	140	762	190	900
90			Pushparajgarh	Bijauri	124	623	192	793
91			Pushparajgarh	Umargohan	82	336	114	425



Figure 2.9:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Bandhavgarh-Achanakmar



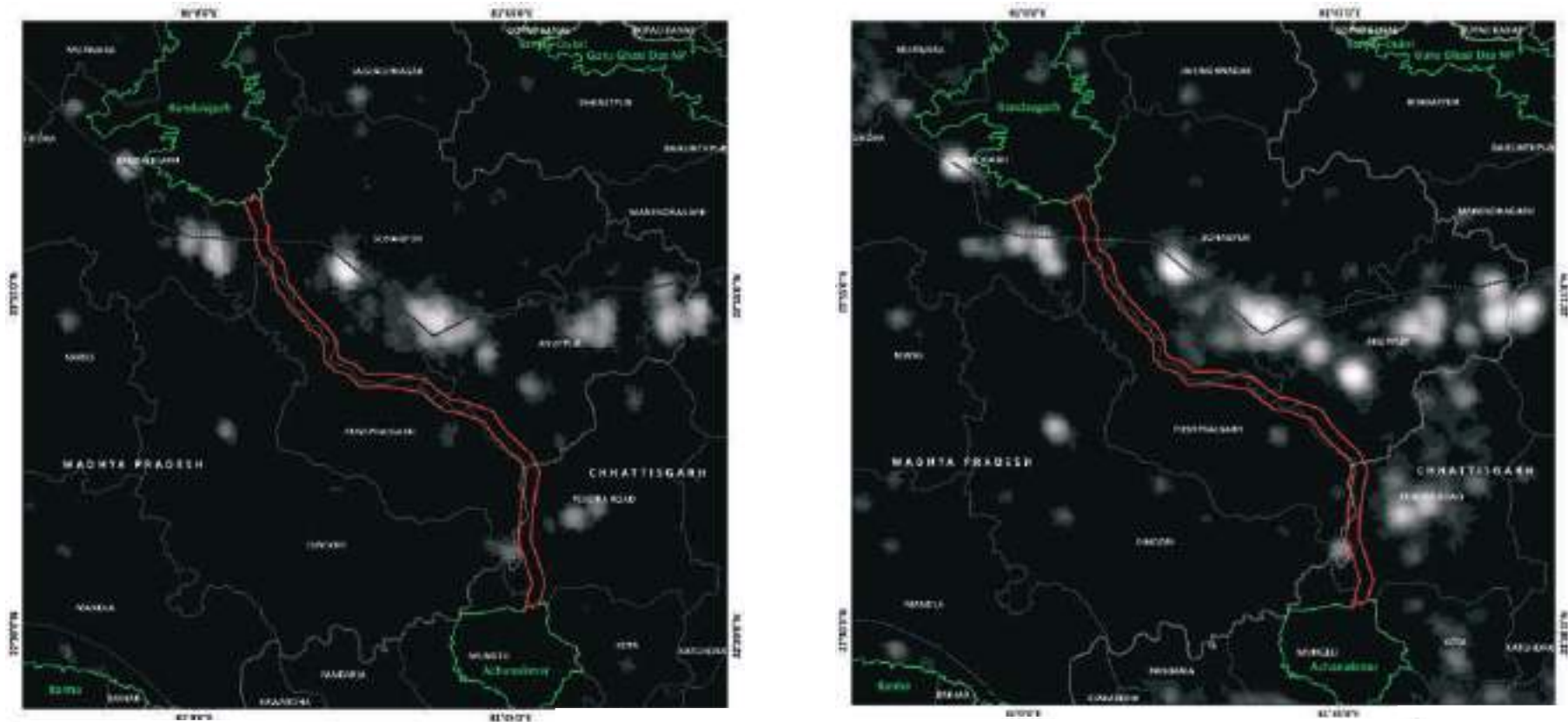
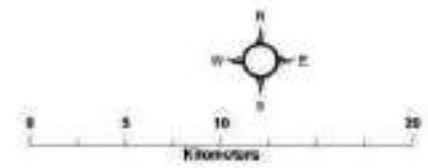
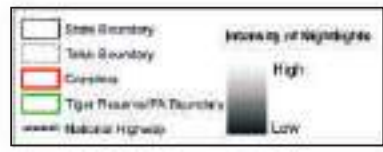


Figure 2.10:

Human habitation as depicted by nightlights within the Bandhavgarh-Achanakmar Corridor landscape in the year 1992 and 2012



BANDHAVGARH-SANJAY-DUBRI-GURU GHASI DAS

Two habitat linkages exist that serve as corridors for connecting source population of Bandhavgarh to sink habitats of Sanjay-Dubri and Guru Ghasi Das. The major threats in this landscape to habitat linkages are linear developments of structures associated with mining activities. The second important threat is biotic pressures and poaching of prey and tigers. A vigil needs to be kept at all times while granting approvals to projects in this region so that appropriate mitigation measures are ensured from the planning phase of projects. Inputs in the form of restorative ecology and eco development are needed to keep/ make the corridors functional. The importance of this linkage cannot be undermined as towards the east large habitat still exists but can only be populated by tigers if connectivity with Bandhavgarh remains intact. Bandhavgarh-Sanjay-Dubri-Guru Ghasi Das holds promise for long term tiger conservation but only if this connectivity remains functional.

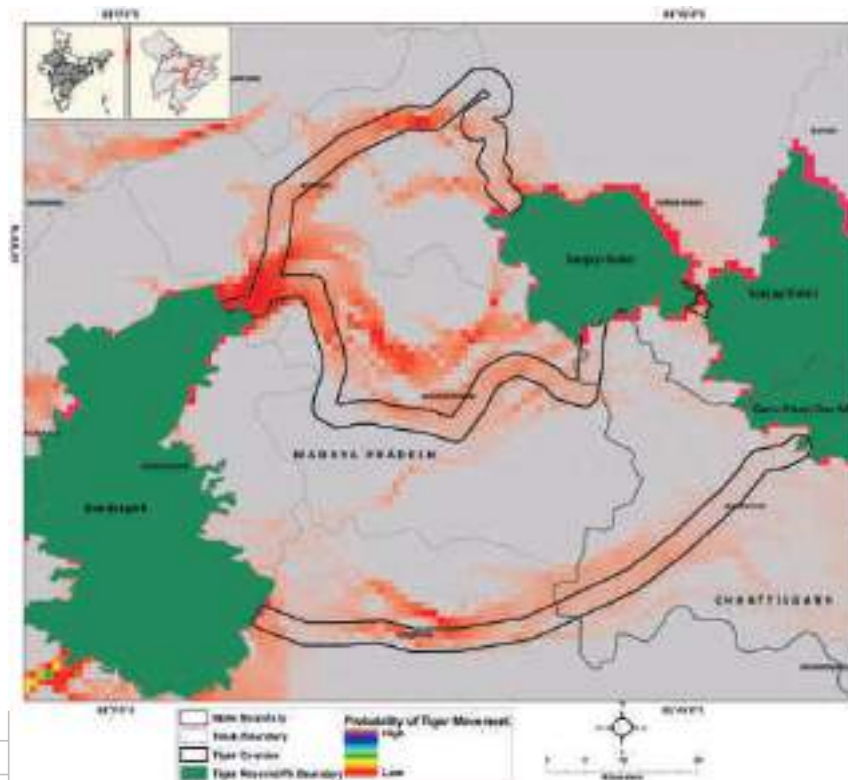


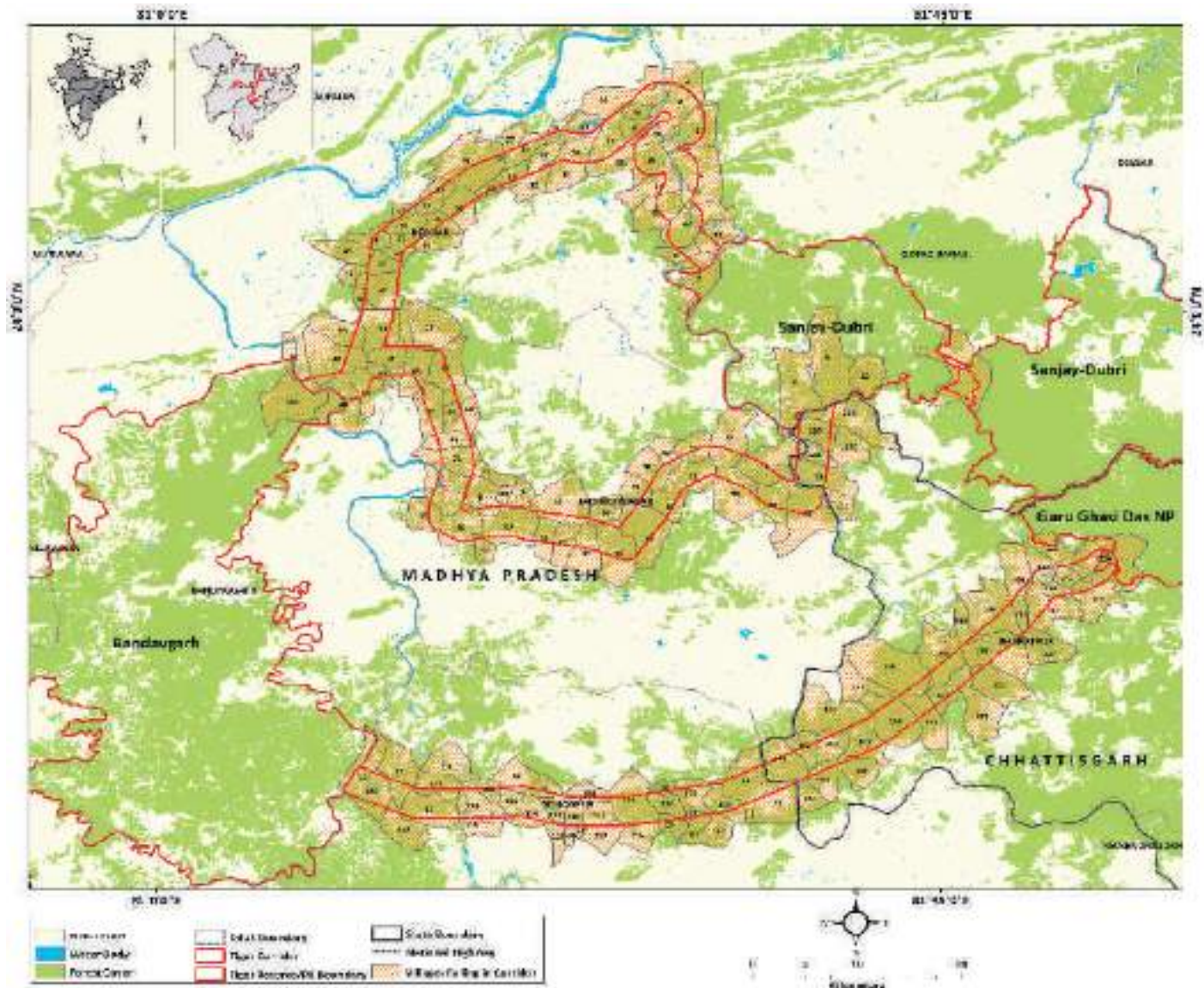
Figure 2.11:
Potential habitat connectivity for tiger movement between Bandhavgarh-Sanjay-Dubri-Guru Ghasi Das as depicted by CIRCUITScape model

Bandhavgarh-Sanjay-Dubri-Guru Ghasidas

Habitat size	21607 Km ²
Source Population	Bandhavgarh Tiger Reserve
Size of Source	47-71
Protected Areas	Bandhavgarh Tiger Reserve Sanjay-Dubri Guru Ghasidas NP
Corridors	Bandhavgarh -Sanjay-Dubri

Figure 2.12:

Least Cost Pathway corridor for Tiger movement between Bandhavgarh-Sanjay-Dubri-Guru Ghasi Das overlaid with village map (the village numbers are referenced in Table 2.3)



Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Madhya Pradesh	Sidhi	Majholi	Ghoghi	41	241	68	338
2			Majholi	Parsili	193	1100	306	1329
3			Majholi	Naudhiya	556	2838	858	3970
4			Kusmi	Amjhar	NA	NA	174	748
4			Kusmi	Amjhar	NA	NA	NA	NA
5			Majholi	Chamradol	387	1785	522	2354
6			Kusmi	Goindwar	29	173	71	264
7			Kusmi	Dubari Kalan	162	717	215	831
8			Kusmi	Lawahi	74	393	105	522
9			Kusmi	Deomath	104	545	191	707
10			Kusmi	Kota	252	1227	359	1513
11			Kusmi	Khaira	35	188	60	261
12		Shahdol	Jaisinghnagar	Pathrahta	220	1159	378	1881
13			Beohari	Sathni	254	1270	368	1654
14			Beohari	Magardaha	274	1347	401	1688
15			Beohari	Bhanni	449	2173	621	2819
16			Beohari	Sejhari	31	164	67	273
17			Beohari	Sarwahi Khurd	220	1195	334	1597
18			Beohari	Bhamraha	461	2280	662	2712
19			Beohari	Khari	150	650	185	903
20			Beohari	Deori	208	1125	261	1405
21			Beohari	Mair	93	445	117	569
22			Beohari	Ambar	NA	NA	241	1004
22			Beohari	Ambar	NA	NA	NA	NA
23			Jaisinghnagar	Patehara Tola	63	377	118	514
24			Beohari	Nakuni	213	1096	331	1482
25			Beohari	Judmani	55	268	88	363
26			Beohari	Hathwar	86	488	161	660
27			Beohari	Nado	151	764	221	1039
28			Beohari	Karaundiya	141	685	190	851



Table 2.3:
Villages within the
Least Cost Pathway
Corridor
connecting Bandhavgarh-
Sanjay-Dubri-
Gurughasi Das as
shown in Fig. 2.12

Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
29			Beohari	Jagmal	154	763	263	1110
30			Beohari	Boddiha	162	924	280	1133
31			Beohari	Gada	228	1141	328	1453
32			Beohari	Papredi	375	1914	597	2379
34			Beohari	Tikhawa	387	1996	497	2482
35			Beohari	Sarwahi Kalan	153	792	228	1214
36			Beohari	Charka	255	1378	440	1869
37			Beohari	Bocharo	211	1122	379	1606
38			Beohari	Hanumanpur	163	842	289	1041
39			Beohari	Kharhara	54	309	85	425
40			Beohari	Mahdeva	100	304	295	1299
41			Jaisinghnagar	Khadgadi	173	754	204	806
42			Jaisinghnagar	Umarkhohi	101	484	147	622
43			Jaisinghnagar	Aunta	47	238	69	282
44			Beohari	Devarda	146	725	219	920
45			Beohari	Pondi Khurd	104	485	173	792
46			Beohari	Chandrmadol	NA	NA	NA	NA
47			Beohari	Bhainstal	NA	NA	NA	NA
48			Beohari	Newari	NA	NA	NA	NA
49			Beohari	Bhutha Tola	NA	NA	NA	NA
50			Beohari	Karri	NA	NA	NA	NA
51			Beohari	Parsel	NA	NA	NA	NA
52			Beohari	Padui	NA	NA	NA	NA
53			Beohari	Mudchaur	NA	NA	NA	NA
54			Beohari	Davraunha	73	347	105	547
55			Beohari	Chhatwa	63	286	104	455
56			Beohari	Jamuniha	39	191	70	302
57			Jaisinghnagar	Pipari	123	629	196	765
58			Jaisinghnagar	Bansa	336	1562	493	1930
59			Jaisinghnagar	Tetka	255	1267	359	1686

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
60			Jaisinghnagar	Basahi	169	846	249	1090
61			Beohari	Khari Badi	119	599	208	853
62			Jaisinghnagar	Ghori Ghat	116	496	94	428
62			Jaisinghnagar	Ghori Ghat	38	156	121	543
63			Jaisinghnagar	Dhaneda	150	713	186	933
65			Beohari	Banasi	79	402	143	611
66			Beohari	Khusariya	73	319	104	461
67			Jaisinghnagar	Charkwah	98	486	169	794
68			Jaisinghnagar	Hidwah	34	243	67	280
69			Jaisinghnagar	Jamudi	232	1131	305	1416
70			Jaisinghnagar	Malauti	102	540	159	706
71			Jaisinghnagar	Thadi Pathar	53	296	73	338
72			Jaisinghnagar	Tali Kalan	182	930	244	1080
73			Jaisinghnagar	Pahadiya	223	1021	302	1166
74			Jaisinghnagar	Narghi	69	336	95	423
75			Jaisinghnagar	Ghiyar	87	463	127	582
76			Jaisinghnagar	Mudariya Tola	194	874	257	1072
77			Jaisinghnagar	Bataudi	87	479	134	588
78			Jaisinghnagar	Karki	527	2510	701	2902
79			Jaisinghnagar	Kolhua	18	83	33	138
80			Jaisinghnagar	Bansukli	343	1570	446	1813
81			Jaisinghnagar	Kothigarh	164	856	271	1039
82			Jaisinghnagar	Gajwahi	143	666	187	808
83			Jaisinghnagar	Mungaha	44	220	53	254
84			Jaisinghnagar	Pathrapani	81	397	114	487
85			Jaisinghnagar	Antoli	130	674	193	864
86			Jaisinghnagar	Bartua	38	179	48	224
87			Jaisinghnagar	Kanadi Kalan	325	1595	491	1910
88			Jaisinghnagar	Nadna	132	639	206	817
89			Jaisinghnagar	Bineka	200	942	240	1076



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
90			Jaisinghnagar	Basnagri	174	849	199	1043
91			Sohagpur	Beliya	162	641	194	762
92			Sohagpur	Amohali	NA	NA	NA	NA
93			Sohagpur	Gadh (garh)	NA	NA	NA	NA
94			Sohagpur	Hardiha Kalan	NA	NA	NA	NA
95			Jaisinghnagar	Jhalra	NA	NA	NA	NA
96			Beohari	KHAND	2373	10921	2305	10653
97			Sohagpur	Ankuri	252	1144	333	1330
98			Sohagpur	Bela	215	950	285	1166
98	Chhattisgarh	Koriya	Bharatpur	Bela	126	570	200	719
99	Madhya Pradesh	Shahdol	Sohagpur	Dadratola	164	792	224	993
100			Sohagpur	Duladar	147	666	184	744
101			Sohagpur	Pondi	92	386	108	451
102			Sohagpur	Bhadwahi	156	669	201	775
104			Sohagpur	Dhaunha	156	667	192	768
105			Sohagpur	Chandela	105	437	145	571
105	Chhattisgarh	Koriya	Bharatpur	Chandela	34	145	57	166
106	Madhya Pradesh	Shahdol	Sohagpur	Mehrauda	55	238	68	317
107			Sohagpur	Bhitri	22	102	26	105
108			Sohagpur	Kudra Tola	59	297	92	378
109			Sohagpur	Patori	93	469	123	569
110			Sohagpur	Semra	136	667	167	774
111			Sohagpur	Kodar	51	223	67	239
112			Sohagpur	Lamar	75	355	125	467
113			Sohagpur	Harri Dol	78	359	95	444
114			Sohagpur	Kudari	168	757	208	918
115			Sohagpur	Bochaki	182	987	251	1153
116			Sohagpur	Kholka	84	400	95	421
117			Sohagpur	Sudwar	163	874	201	1005
118			Sohagpur	Karua	318	1484	433	1742

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
119			Sohagpur	Hardiha Khurd	8	60	3	33
120			Sohagpur		NA	NA	NA	NA
121		Umaria	Bandhogarh	Kichkhidi	124	594	199	726
122			Bandhogarh	Ramna No. 2	NA	NA	NA	NA
123			Bandhogarh	Chorha	46	240	69	318
124			Bandhogarh	Paili	29	172	41	213
126			Bandhogarh	Makra	55	265	82	335
127			Bandhogarh	Baradadhar	90	458	116	533
128	Chhattisgarh	Koriya	Bharatpur	Badwahi	238	1091	387	1448
129			Bharatpur	Barchha	25	109	38	142
130			Bharatpur	Mehdauli	116	578	195	771
131			Bharatpur	Satkiyari	54	249	78	348
133			Bharatpur	Udaki	164	737	244	904
134			Bharatpur	Chuil	81	404	105	476
135			Bharatpur	Patasi	48	245	74	292
136			Bharatpur	Semriha	173	830	242	1104
137			Bharatpur	Kudra	76	451	126	522
138			Bharatpur	Masaura	89	369	129	465
139			Bharatpur	Ara	100	445	152	540
140			Bharatpur	Tilauli	143	534	202	579
141			Bharatpur	Godhaura	144	611	200	734
142			Bharatpur	Hathwari	80	367	106	519
143			Bharatpur	Katharradol	22	104	28	130
144			Bharatpur	Aktawar	198	1017	263	1196
145			Bharatpur	Badhwar	14	62	22	86
146			Bharatpur	Janakpur	824	3773	1167	4849
147			Bharatpur	Bhagwanpur	373	1820	532	2101
148			Bharatpur	Jardol	37	148	56	165
149			Bharatpur	Ganjar	69	281	83	324
150			Bharatpur	Jamthan	251	1080	391	1365



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
151			Bharatpur	Tartora	73	296	101	386
152			Bharatpur	Kanjia	363	1571	454	1802
153			Bharatpur	Jolgi	106	506	186	632
154			Bharatpur	Usta	NA	NA	NA	NA
155			Bharatpur	Malakdol	192	860	257	951
156			Bharatpur	Kuwarpur	194	715	293	930
157			Bharatpur	Bhumka	56	251	101	370
158			Bharatpur	Mannodh	118	509	173	643
159			Bharatpur	Patpartola	77	318	112	395
161			Bharatpur	Matiya	NA	NA	NA	NA
162			Bharatpur	Pipariyadol	NA	NA	NA	NA

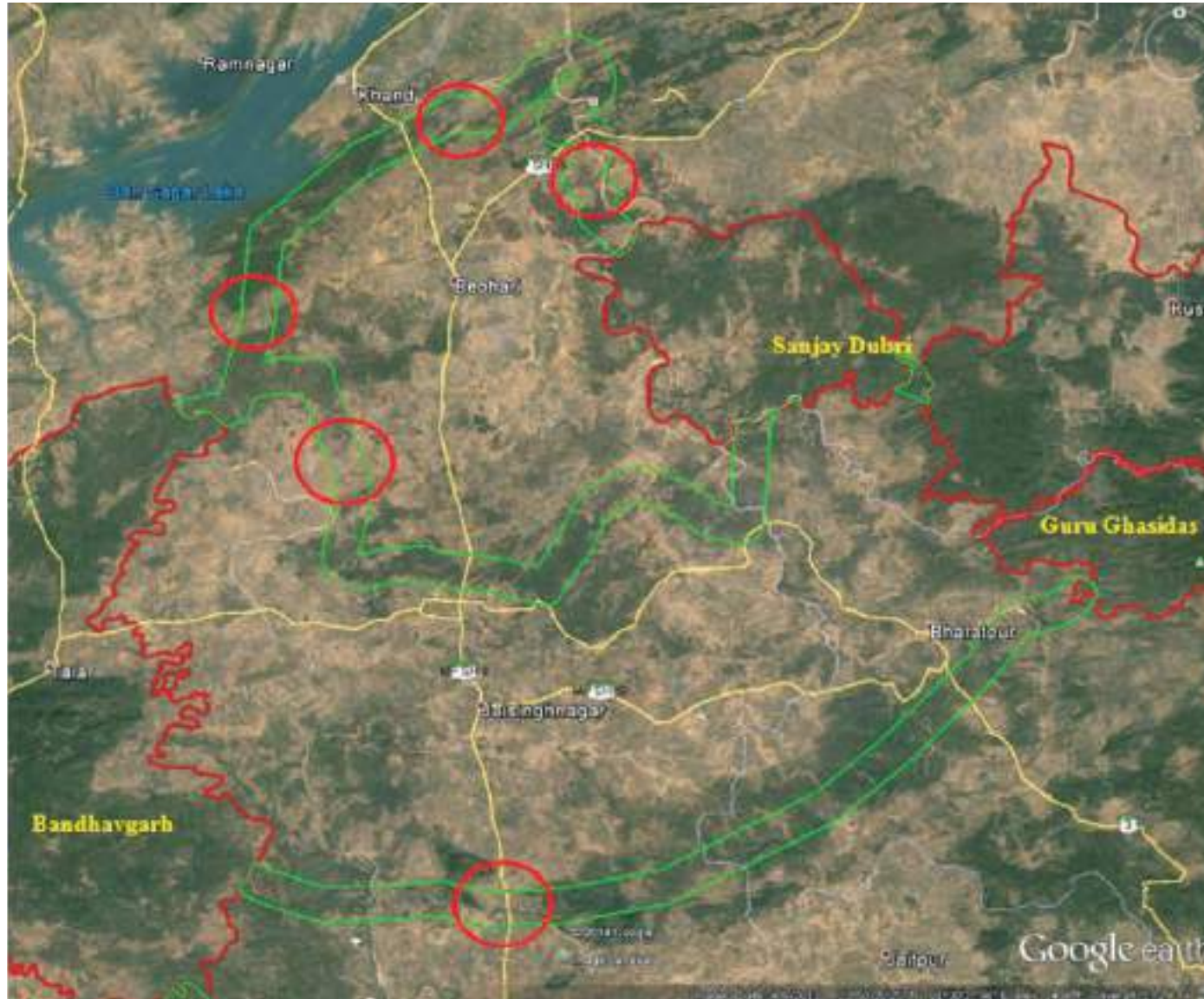


Figure 2.13:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Bandhavgarh-Sanjay-Dubri-Guru Ghasi Das



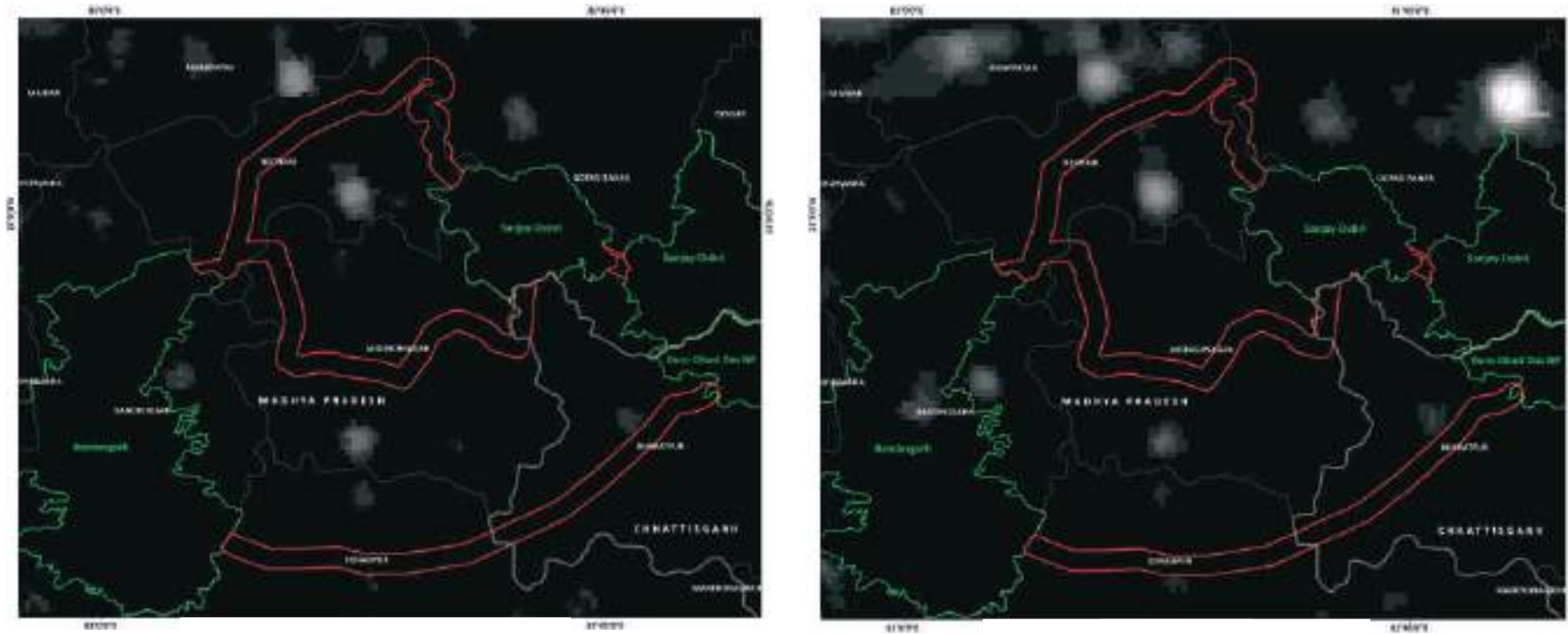
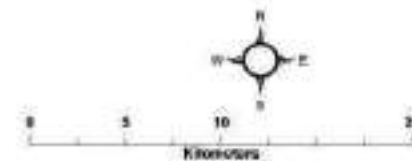


Figure 2.14:
Human habitation as depicted by nightlights within the Bandhavgarh-Sanjay-Dubri-Guru Ghasi Das Corridor landscape in the year 1992 and 2012



GURU GHASI DAS-PALAMAU-LAWALONG

Sanjay TR and Guru Ghasi Das NP are a contiguous forest patch, this patch continuous further as Tamoringla WLS. From Tamoringla WLS two forested arms project eastwards and serve as corridors to connect with Palamau TR. This entire area is rich in minerals specially coal. Utmost care needs to be taken to ensure that the corridor value of these habitats is not compromised while granting permissions for mineral extraction. This habitat holds great potential for recovering tiger populations as currently they have low density of tigers but with management inputs and connection with Bandhavgarh source they can be revived. Sanjay has started showing recovery of tiger populations after being declared tiger reserve.

Guru Ghasidas-Palamau-Lawalong

Habitat size	18759 Km ²
Source Population	Palamau
Size of Source	6-13
Protected Areas	Guru Ghasidas NP Tamoringla WLS Semarsot WLS Palamau Mahauaduar WLS Lawalong WLS
Corridors	Guru Ghasidas - Tamoringla Tamoringla-Palamau-Semarsot WLS Palamau-Lawalong WLS

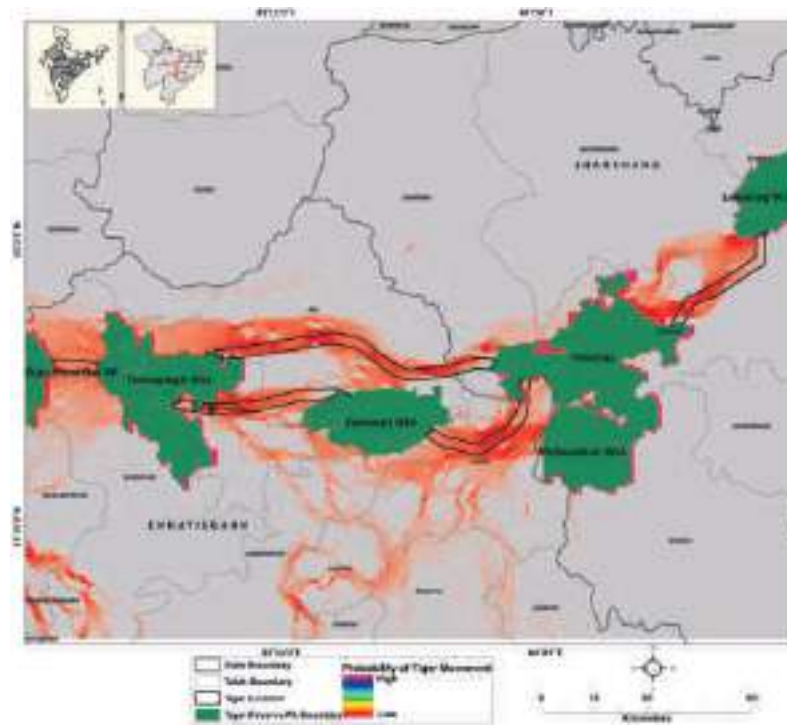


Figure 2.15
Potential habitat connectivity for tiger movement between Bandhavgarh-Sanjay-Dubri-Guru Ghasi Das as depicted by CIRCUITSCAPE model

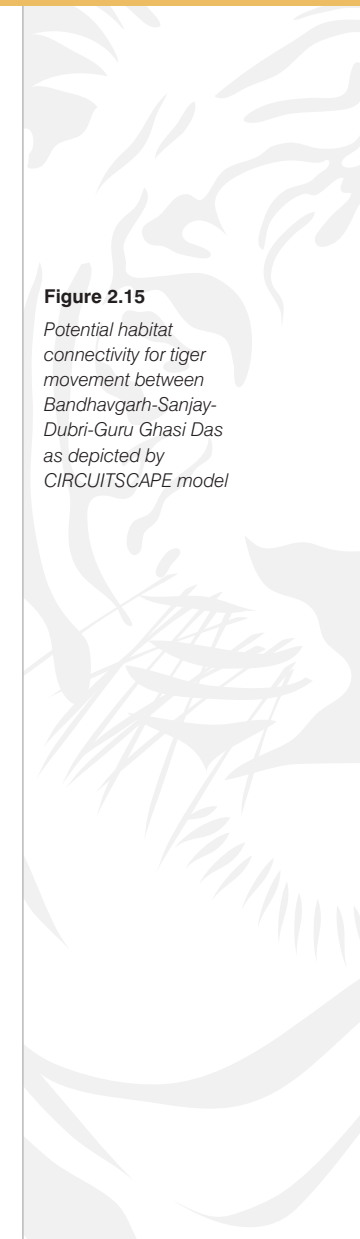
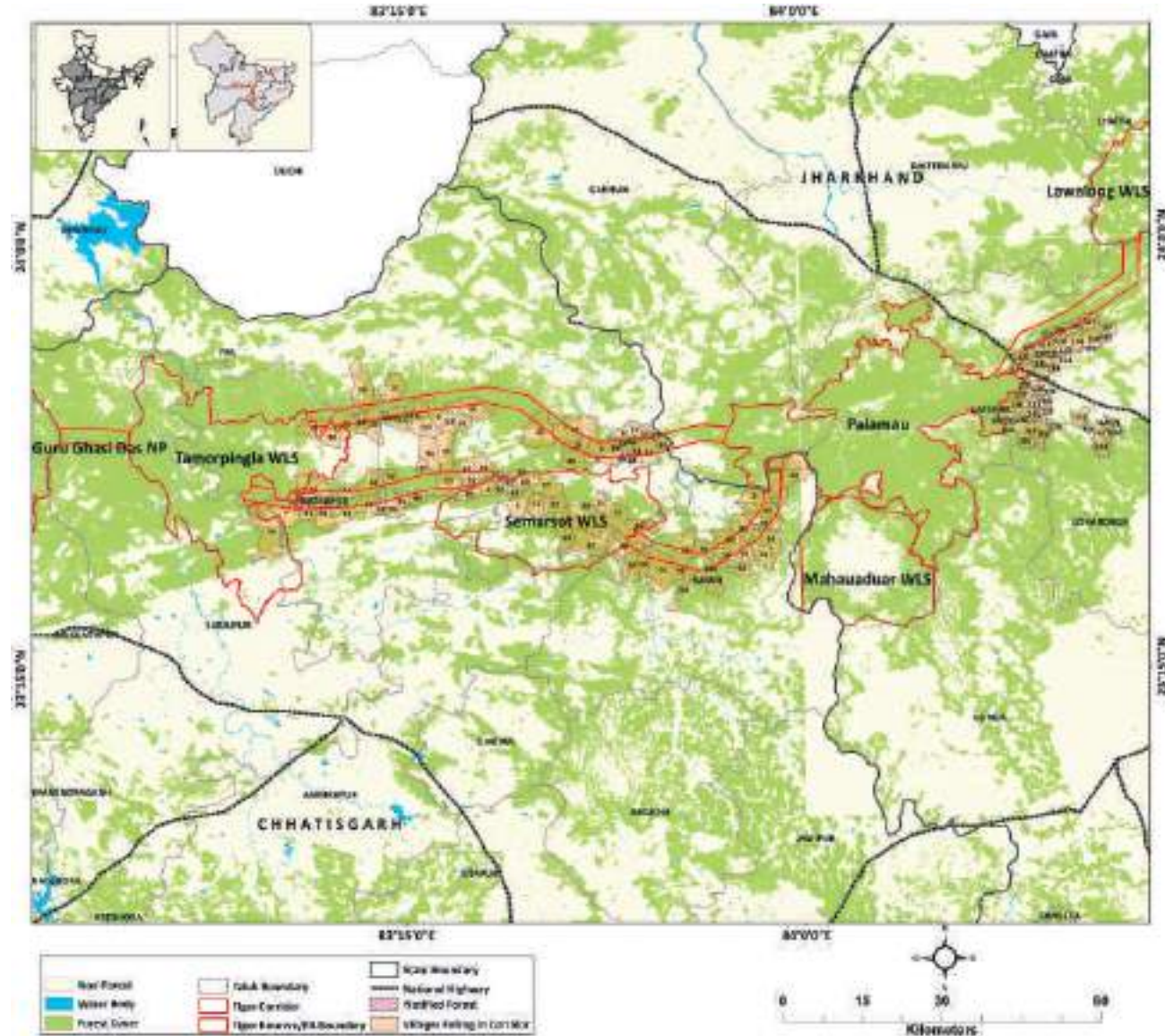


Figure 2.16:

Least Cost Pathway corridor for Tiger movement between Guru Ghasi Das-Palamau-Lawalong overlaid with village map (the village numbers are referenced in Table 2.4)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Chhattisgarh	Surguja	Pal	Bhanora	321	1752	578	2412
2			Pal	Kapaut	83	437	119	483
3			Samari	Kurdih	299	1486	395	1847
4			Wadrafnagar	Dhadhia	249	1308	327	1543
5			Wadrafnagar	Budhatand	229	1173	348	1426
6			Pal	Dumarkhola	318	1618	428	1938
7			Pratappur	Jajawal	313	1533	365	1740
8			Pal	Adhaura	80	335	173	655
9			Pal	Lurghuta	109	488	150	632
10			Pal	Dhaneshpur	72	393	112	506
11			Pal	Bardar	192	925	289	1245
12			Pal	Vishramnagar	131	626	179	779
13			Pal	Chitvishrampur	73	405	129	453
14			Wadrafnagar	Kotrahi	390	2330	572	2905
15			Wadrafnagar	Rajkheta	403	2143	584	2804
16			Wadrafnagar	Manpur	188	817	218	938
17			Wadrafnagar	Dhodhi	132	639	220	821
18			Wadrafnagar	Alka	228	1155	308	1436
19			Pratappur	Dhondha	188	912	226	1013
20			Wadrafnagar	Kachhia	103	507	138	599
21			Wadrafnagar	Pansara	131	654	169	665
22			Wadrafnagar	Kailashpur	122	592	159	694
23			Pratappur	Narola	371	1990	452	2251
24			Pratappur	Batai	80	421	133	557
25			Pal	Manikpur	286	1366	409	1598
26			Wadrafnagar	Bhaisamunda	9	49	18	72
27			Wadrafnagar	Odari	301	1502	420	1794
28			Pratappur	Bonga	322	1639	417	1964
29			Pal	Sendur	318	1584	528	1978
30			Pratappur	Govindpur	329	1750	396	1989

Table 2.4:
Villages within the Least Cost Pathway Corridor connecting Guru Ghasi Das-Palamau-Lawalong as shown in Fig.2.16



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Pal	Sarangpur	118	727	188	876
32			Wadrafnagar	Badkagaon	277	1363	377	1648
33			Wadrafnagar	Shardapur	376	1943	516	2415
34			Pal	Piprahi	56	267	80	352
35			Pal	Jabrahi	21	102	30	131
36			Pal	Obari	125	718	162	776
37			Pal	Khurra	10	47	21	95
38			Pal	Alagdiha	72	348	93	359
39			Pal	Semali	84	420	106	446
40			Pal	Jatro	110	687	224	827
41			Pal	Banaur	97	429	160	578
42			Pal	NawadihKhurd	62	267	51	235
43			Samari	Pundag	160	821	239	1067
44			Pal	Sonhara	125	617	169	827
45			Pal	Kapildevpur	326	1659	392	1935
46			Pal	Pindra	91	468	134	534
47			Wadrafnagar	Sursa (bhandarpura)	118	552	146	679
48			Pal	Surra	127	649	181	811
49			Wadrafnagar	ChalgaliKhas	288	1485	380	1869
50			Pratappur	PahadKarwa	131	576	169	666
51			Samari	Chunchuna	132	646	170	802
52			Wadrafnagar	Bhaui Alias Jhor	107	459	139	571
53			Wadrafnagar	Duwari	112	659	168	808
54			Pratappur	Gorgi (neelkanthpur)	250	1241	288	1314
55			Pal	Dhanwar Kalan	131	631	207	1284
56			Wadrafnagar	Rampur	202	924	257	1085
57			Pal	Tarkakhand	151	774	208	964
58			Pal	Gamhariya	57	259	68	265
59			Samari	Bairdih Kalan	91	457	152	648
60			Pal	Champapur	133	634	210	812

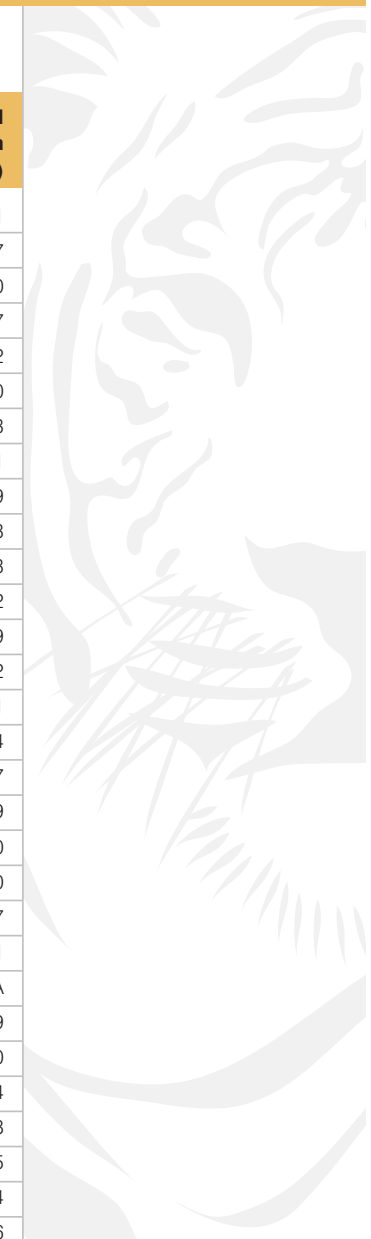
Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
61			Pratappur	Nawadhakki	73	347	106	377
62			Pal	Lurgi Kalan	160	785	207	880
63			Pal	Banda	85	386	103	407
64			Pal	Padhi	145	697	189	886
65			Samari	NawadihKhurd	72	386	112	493
66			Pratappur	Majhgawan	114	643	145	756
67			Pal	Chandaura	234	1007	309	1272
68			Pal	Pathari	64	305	83	336
69			Pratappur	Lolki	214	1113	321	1385
71			Pratappur	Giriya	42	210	65	275
72			Pratappur	GhatPendari	41	236	63	263
73			Pratappur	Pakni	299	1566	361	1767
74			Surajpur	Chikni	247	1144	293	1379
75			Pal	Jhapra	112	566	192	710
76			Pal	Ghaghara	163	882	246	1115
77			Pal	Jhalariya	189	955	244	976
78			Pratappur	Khunshi	135	648	176	779
79			Pal	Budhudih	87	474	126	529
80			Pratappur	Pahiya	209	944	242	1119
81			Pratappur	Anjani	82	380	98	431
82			Pratappur	Deori	175	823	190	946
83			Pal	Kanda	123	565	159	686
84			Samari	Chatniya	176	823	220	1021
85			Samari	Jariyo	85	426	108	520
86			Pal	Kotpali	160	806	209	950
87			Pal	Sitampur	165	732	181	884
88			Samari	Bata	193	1126	248	1339
89			Samari	Karamdih	66	359	85	367
90			Samari	Lahasoon Path	177	968	221	1079
91			Samari	Megaji	139	625	169	796





Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
92			Samari	Kothali	377	1735	437	1996
93			Samari	Dattram	157	915	198	981
94			Samari	Dumarkholi	260	1348	325	1617
95			Samari	Samudri	33	193	61	249
96			Samari	Idaripath	123	611	142	617
97			Samari	Asanpani	115	598	164	625
98			Samari	Charahat Kalan	132	715	181	795
99			Samari	BairdihKhurd	15	64	140	431
100			Samari	Laxmanpur	117	589	138	633
101			Samari	Chainpur	272	1361	206	801
102	Jharkhand	Palamu	Latehar	Largari	126	722	140	851
103			Latehar	Hethpochra	270	1561	355	2052
104			Latehar	Sohdag	93	514	145	888
105			Latehar	Hesiklbar	27	227	47	287
106			Latehar	Marabar	49	256	62	383
107			Latehar	Dihi	387	2391	498	2985
108			Latehar	Tubed	162	843	210	1225
109			Latehar	Kaima	137	642	149	1012
110			Latehar	Sasang	258	1628	345	1983
111			Latehar	Ambajharan	54	268	77	391
112			Latehar	Jaram	47	264	65	337
113			Latehar	Manjar	89	634	140	861
114			Latehar	Sukri	196	1030	239	1257
115			Latehar	Baridih	72	360	86	409
116			Latehar	Nawari	193	1337	285	1373
117			Latehar	DhobiaTharan	29	181	37	218
118			Latehar	Hutar	129	684	158	844
119			Latehar	Sotam	107	645	153	869
120			Latehar	Korhas	121	846	203	1235
121			Latehar	Patuki	40	231	53	343

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
122			Latehar	Oden	60	372	84	411
123			Latehar	Lohisini alias Tulbul	70	422	91	527
124			Latehar	Matnag	27	187	44	250
125			Latehar	Labarpur	63	322	91	467
126			Latehar	Bendi	167	841	237	1312
127			Latehar	DurangiKhurd	83	474	129	720
128			Latehar	Parsahi	238	1482	354	2003
129			Latehar	Bachra	29	144	33	171
130			Latehar	Kend	61	326	86	459
131			Latehar	Hotwag	200	1173	269	1513
132			Latehar	Dumariatanr	30	161	44	243
133			Latehar	Ledhpa	131	637	166	912
134			Latehar	Durangi Kalan	108	565	150	789
135			Latehar	Jer	76	407	84	502
136			Latehar	Godna	106	563	153	791
137			Latehar	Kodag	59	341	81	434
138			Latehar	TupuKhurd	118	571	164	827
139			Latehar	Hesla	80	470	105	589
140			Latehar	Semariatanr	69	357	79	430
141			Latehar	Kothila	17	129	27	140
142			Latehar	Richughutu	107	406	110	557
143			Latehar	Peshrar	161	908	178	1081
144			Latehar	Uparpochra	NA	NA	NA	NA
145			Latehar	Patariachotag	70	370	120	669
146			Latehar	Lundi	94	460	121	620
147			Latehar	Tupu Kalan	47	245	66	324
148			Latehar	Tarwadih	320	1747	473	2358
149			Latehar	Orwai	81	446	113	535
150			Latehar	Gurgu alias Irgu	103	585	130	734
151			Latehar	Hartua	62	278	77	386



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
152			Latehar	Nawagarh	555	3312	779	4059
153			Latehar	Bingara	155	746	190	913
154			Latehar	Beraini	21	91	30	137
155			Latehar	Demu	296	1653	520	2808
156			Latehar	MankeriJagir	30	146	40	177
157			Latehar	MankeriKhas	46	260	53	324
158			Latehar	Dubiahi	17	83	19	99
159			Latehar	Khairajagir	65	335	63	293
160			Latehar	Kone	80	438	104	446
161			Latehar	Khaira	14	85	21	88
162			Latehar	Narayanpur	48	223	87	461
163			Latehar	Baheratanr	24	110	27	123
164			Latehar	Hosir	83	483	117	604
165			Latehar	Murgidih	49	271	72	394
166			Latehar	Nareshgarh	157	754	176	909
167			Latehar	Nawadih	1	6	1	4
168			Latehar	Ghanghri	27	123	32	128
169			Latehar	Orea	65	325	73	399
170			Latehar	Salaia	38	181	50	225
171			Latehar	Patratu	74	422	107	636
172			Latehar	Gulariatanr	23	81	38	208
173			Latehar	Ichabar	39	196	65	315
174			Latehar	Labarpur	56	243	93	468
175			Latehar	Batat Kalan	87	282	95	475
176			Latehar	Durub	NA	NA	NA	NA
177			Latehar	TeniaKhar	NA	NA	NA	NA
178			Latehar	Parwatanr	NA	NA	NA	NA
179			Latehar	Rehrah	NA	NA	NA	NA
180			Latehar	Pachamba	NA	NA	NA	NA
181			Latehar	Parahiatola	NA	NA	NA	NA



Figure 2.17:
Potential bottlenecks,
obstacles and weak
links within the Least
Cost Pathway corridor
connecting
Bandhavgarh-Sanjay-
Dubri-Guru Ghasi Das



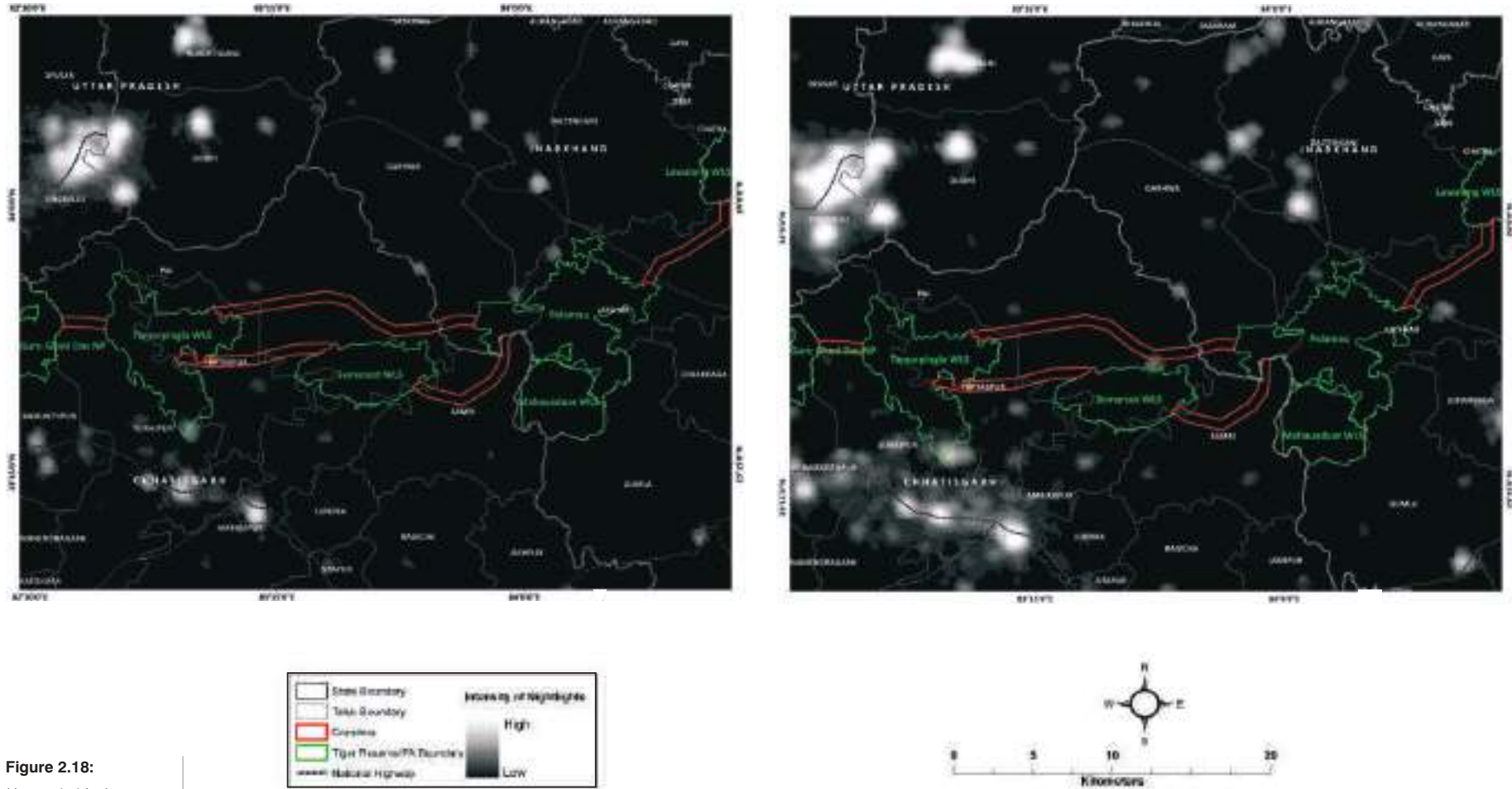


Figure 2.18:
 Human habitation as depicted by nightlights within the Guru Ghasi Das-Palamau-Lawalong Corridor landscape in the year 1992 and 2012

KANHA-ACHANAKMAR

This corridor is vital for sustenance of the Achanakmar tiger population and for meta-population management of pench -Kanha - Achanakmar tiger populations. The corridor is part of an intact forest patch between Kanha-Phen-Achanakmar. However the state governments use the intervening forest for commercial forestry activities . It is important to ensure that these activities do not undermine the functionality of this habitat as a wildlife corridor. Other threats in this corridor are biotic pressures from forest dwelling and neighboring communities which can be alleviated by restorative ecology and eco-development inputs.

Kanha-Achanakmar

Habitat size	16623 Km ²
Source Population	Kanha Tiger Reserve
Size of Source	45-75
Protected Areas	Kanha Tiger Reserve Phen WLS Achanakmar Tiger Reserve Bhoramdeo NP
Corridors	Kanha-Achanakmar Kanha-Bhoramdeo Kanha-Phen

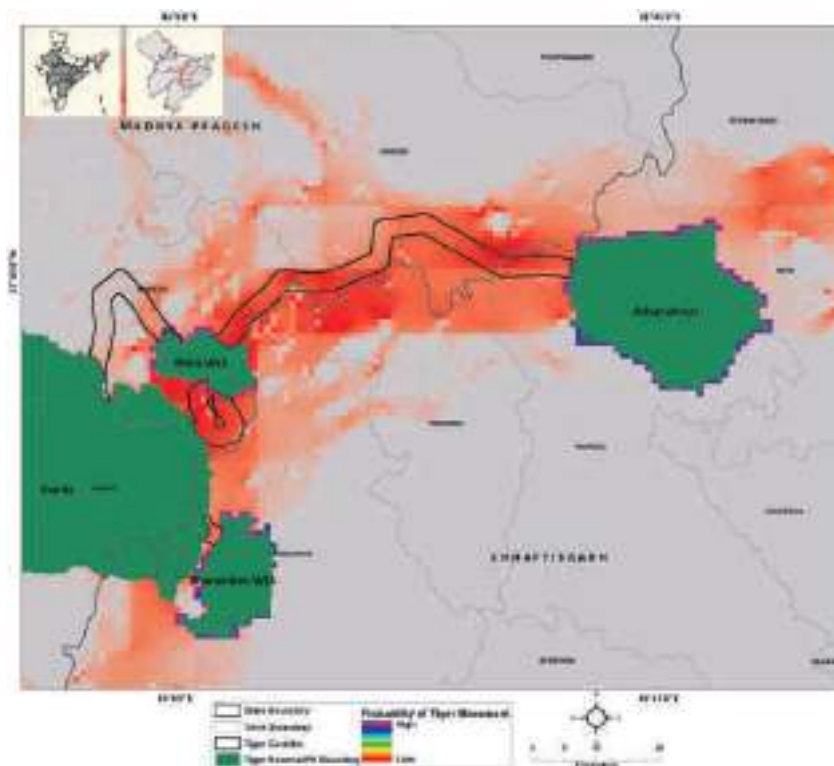


Figure 2.19:
Potential habitat connectivity for tiger movement between Kanha-Achanakmaras depicted by CIRCUITSCAPE model

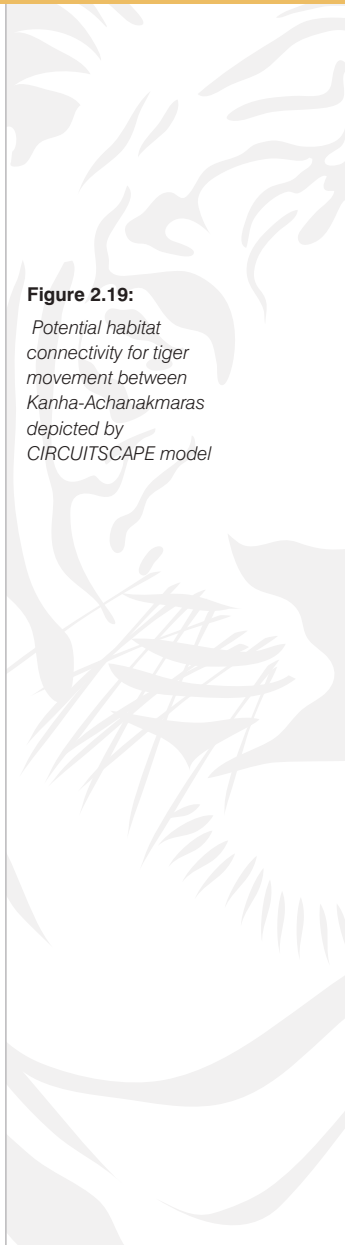
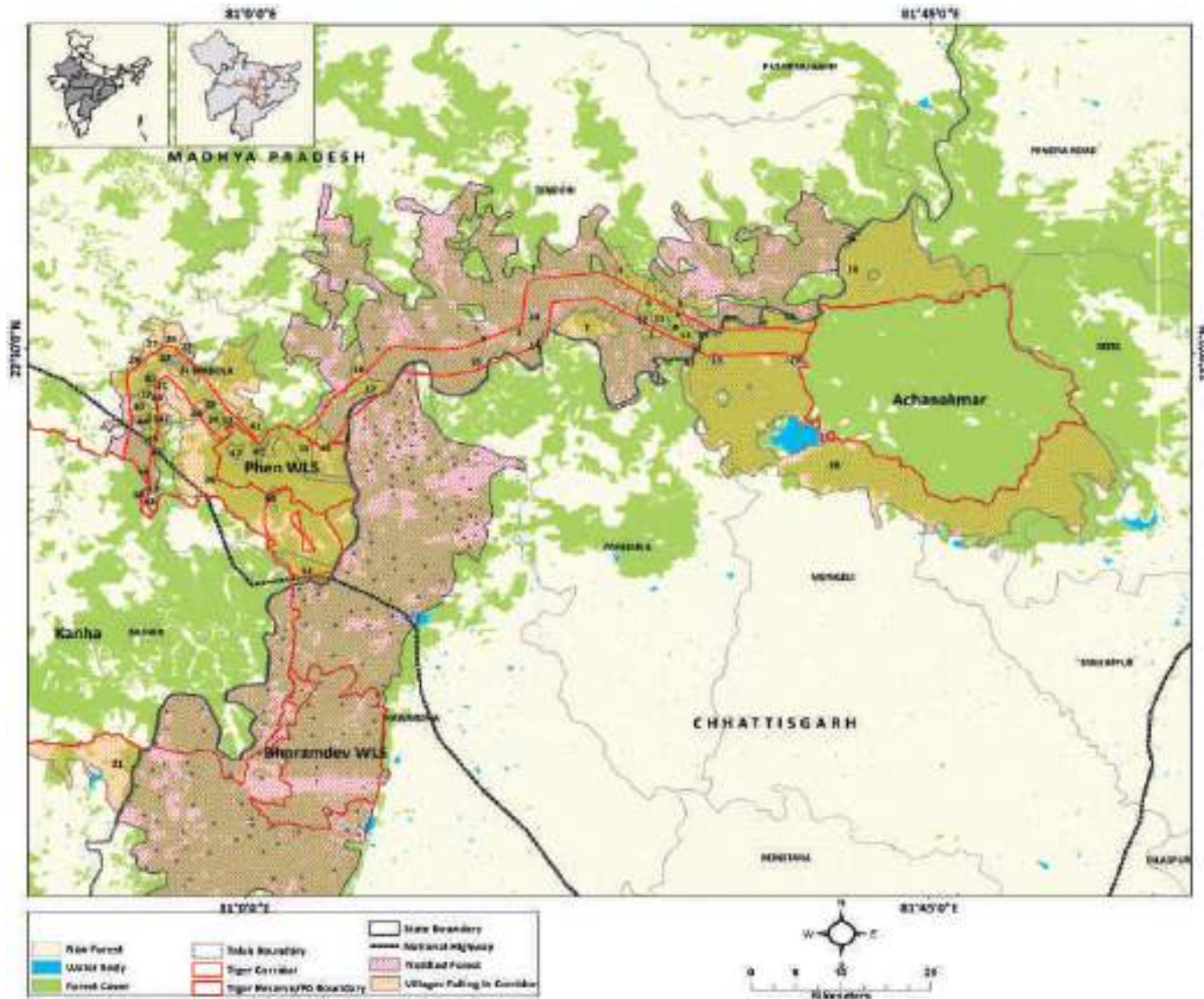


Figure 2.20:

Least Cost Pathway corridor for Tiger movement between Kanha-Achanakmar overlaid with village map (the village numbers are referenced in Table 2.5)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Madhya Pradesh	Dindori	Dindori	F 58 Kindra Kindra (kendra) behraF.v	59	246	58	264
2		Dindori	Dindori	F 23 SilpidiF.v.	140	670	184	815
3		Dindori	Dindori	F 17 Kandawani F V	45	249	57	287
4		Dindori	Dindori	KarondiRyt	44	201	66	302
5		Dindori	Dindori	Ufri Mal	75	378	86	379
6		Dindori	Dindori	KhamharKhudraRyt	115	624	142	675
7		Dindori	Dindori	F 25 TarachF.v.	132	707	225	909
8		Dindori	Dindori	Chakmi Mal	48	290	70	325
9		Dindori	Dindori	ChakmiRyt	72	384	96	438
10		Dindori	Dindori	F 22 ChandaF.v.	173	889	226	951
11		Dindori	Dindori	SahajanaRyt	95	485	139	579
12		Dindori	Dindori	F 52 Uddhor(udhor)f.v.	108	546	138	632
13		Dindori	Dindori	F 54 DaldalKapatiF.v.	58	279	79	383
14		Dindori	Dindori	F 24 TantarF.v	189	838	228	954
15		Dindori	Dindori	F 38 GhurkutaF.v.	134	677	201	764
16		Mandla	Bichhiya	Masna	93	410	135	475
17		Mandla	Bichhiya	MurtaRyt	117	590	155	636
18	Chhattisgarh	Bilaspur	Lormi	F.34 Chhaparwa	81	357	NA	NA
19		Bilaspur	Lormi	F.9 Aurapani	76	339	NA	NA
20		Bilaspur	Lormi	F.10 Boiraha	66	361	NA	NA
21	Madhya Pradesh	Balaghat	Baihar	F.v.(37) Benda	29	157	42	193
22		Mandla	Bichhiya	KewlariRyt	69	328	93	421
23		Mandla	Bichhiya	AnjaniRyt	74	373	103	472
24		Mandla	Bichhiya	HarratolaRyt	172	823	216	1014



Table 2.5:
Villages within the Least
Cost Pathway Corridor
connecting
Bandhavgarh-
Achanakmar as shown
in Fig. 2.20

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
25		Mandla	Bichhiya	F 33 SurajpuraF.v.	118	599	164	731
26		Mandla	Bichhiya	Anjani Mal	268	1185	281	1324
27		Mandla	Bichhiya	Chandwara Mal	37	180	47	204
28		Mandla	Bichhiya	F 26 AmgahanF.v.	28	132	54	231
29		Mandla	Bichhiya	Amagahan	47	218	45	167
30		Mandla	Bichhiya	Dhenko	49	264	76	332
31		Mandla	Bichhiya	Simariya	24	119	34	178
32		Mandla	Bichhiya	Pondi Alias BaharMunda	349	1546	477	1823
33		Mandla	Bichhiya	Rohta Alias Muhania	13	86	23	105
34		Mandla	Bichhiya	Majhgaon Mal	166	777	252	1081
35		Mandla	Bichhiya	F 36 BaigaKhedaF.v.	72	363	93	426
36		Mandla	Bichhiya	Jamgaon	179	751	230	857
37		Mandla	Bichhiya	Luri	127	588	175	682
38		Mandla	Bichhiya	F 28 RahangiF.v.	75	337	118	464
39		Mandla	Bichhiya	Jaitpuri	56	272	86	350
40		Mandla	Bichhiya	F 29 SaidaF.v.	130	540	164	653
41		Mandla	Bichhiya	BasniRyt.	193	952	274	1150
42		Mandla	Bichhiya	Patpara Jar	15	78	18	86
43		Mandla	Bichhiya	BilaiKhar	83	325	119	436
44		Mandla	Bichhiya	Medha	162	646	201	744
45		Mandla	Bichhiya	F 32 SathiyaF.v.	70	364	115	434
46		Mandla	Bichhiya	Badwar	101	441	147	564
47		Mandla	Bichhiya	F 30 AuraiKheda F.v(oreay)	59	273	96	366

Village _ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
48		Mandla	Bichhiya	F 35 Sajalagan (sajalaghan)f.v	80	408	102	512
49		Mandla	Bichhiya	F 38 Pharikheda Alias Nawnadar	109	551	100	473
50		Mandla	Bichhiya	SaliwadaRyt	58	279	96	384
51		Mandla	Bichhiya	F 42 DeogaonF.v.	69	359	81	457
52		Mandla	Bichhiya	Khamhariya Mal	79	394	107	451
53		Dindori	Dindori	F 54 DaldalKapatiF.v.	58	279	79	383
55		Dindori	Dindori	F 54 DaldalKapatiF.v.	58	279	79	383
58		Mandla	Bichhiya	SaliwadaRyt	58	279	96	384
59		Mandla	Bichhiya	Khamhariya Mal	79	394	107	451
60		Dindori	Dindori	F 54 DaldalKapatiF.v.	58	279	79	383
62		Dindori	Dindori	F 54 DaldalKapatiF.v.	58	279	79	383

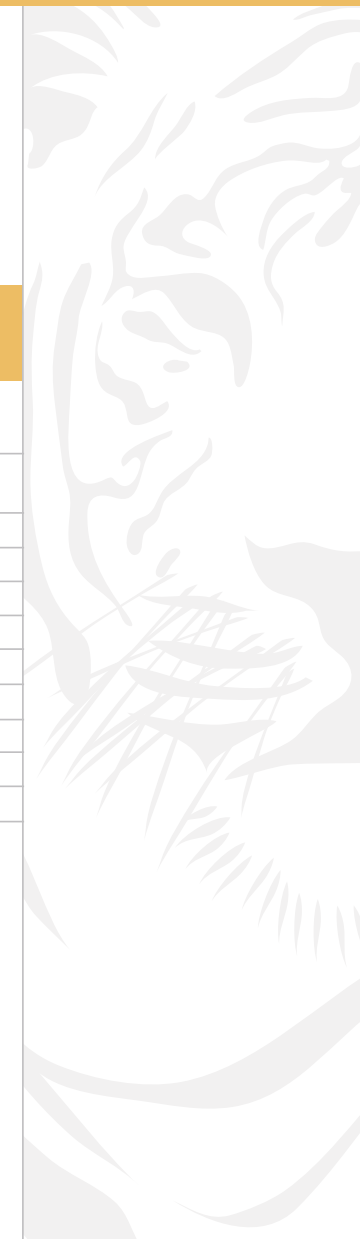


Figure 2.21:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kanha-Achanakmar



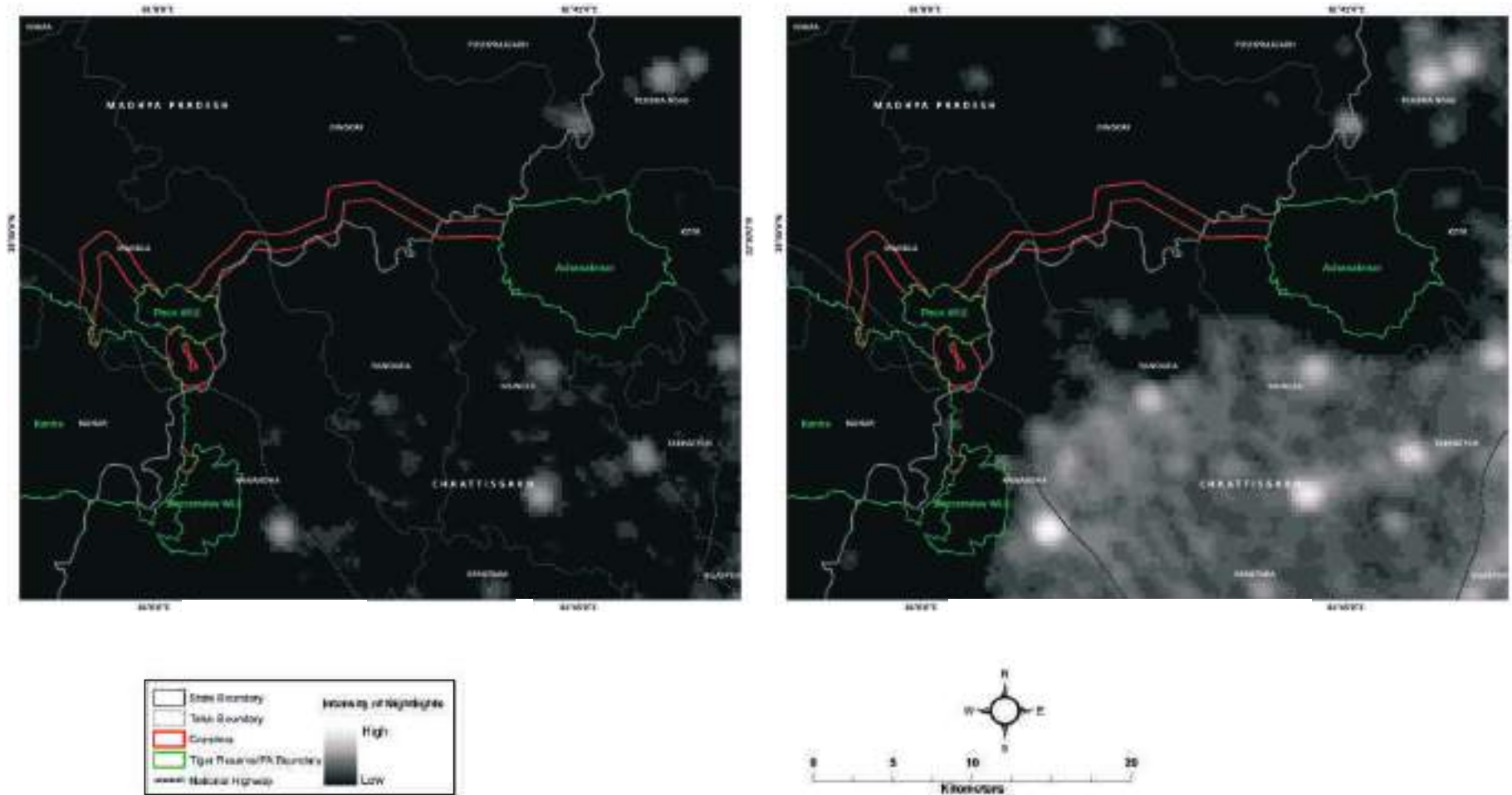


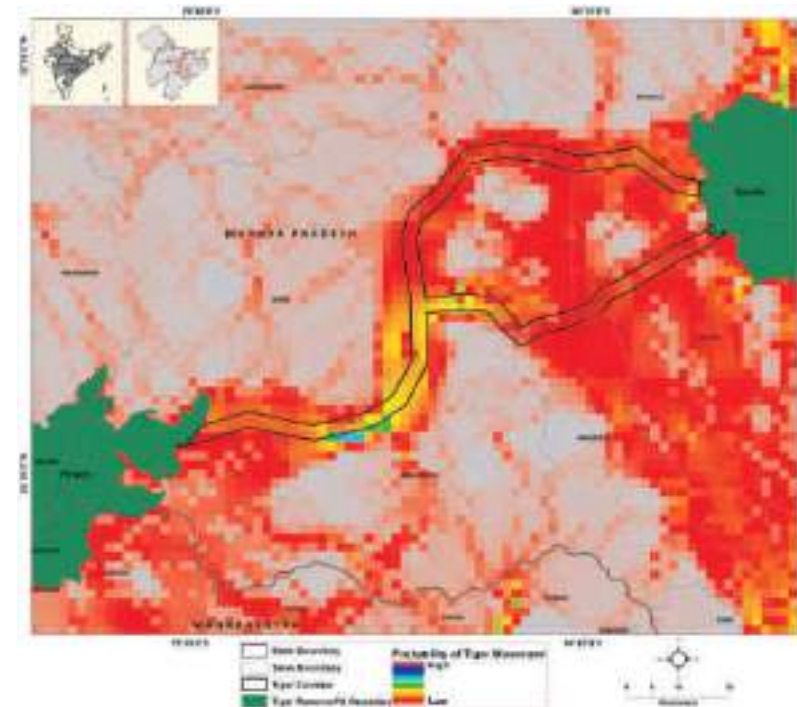
Figure 2.22:
Human habitation as depicted by nightlights within the Kanha-Achanakmar Corridor landscape in the year 1992 and 2012

KANHA-PENCH

Figure 2.23:

Potential habitat connectivity for tiger movement between Kanha-Pench as depicted by CIRCUITSCAPE model

This corridor is an example of a two source populations of tigers can be managed as meta-population. There is evidence from telemetry and camera trapping to show that tigers regularly use this corridor to move between Kanha and Pench. The corridor at places is sufficiently wide so as to support prey species and patches of habitat that serve as temporary refuges for dispersing tigers. However the corridor has come in focus due to the proposed widening of the National Highway -7 to six lanes. Three state highways and railway lines intersect this corridor. The widening of these along with infrastructure development that accompanies such projects is major threat to this vital corridor habitat. If permissions are granted for such activities then appropriate mitigation measures need to be put in place to safeguard the functionality of this corridor for tigers and other wildlife such as Gaur and Wild dog.



Kanha-Pench

Habitat size	16623 Km ²
Source Population	Kanha Tiger Reserve and Pench Tiger Reserve
Size of Source	(45-75) Kanha (53-78) Pench
Protected Areas	Kanha Tiger Reserve and Pench Tiger Reserve
Corridors	Kanha- Pench I Kanha-Pench II

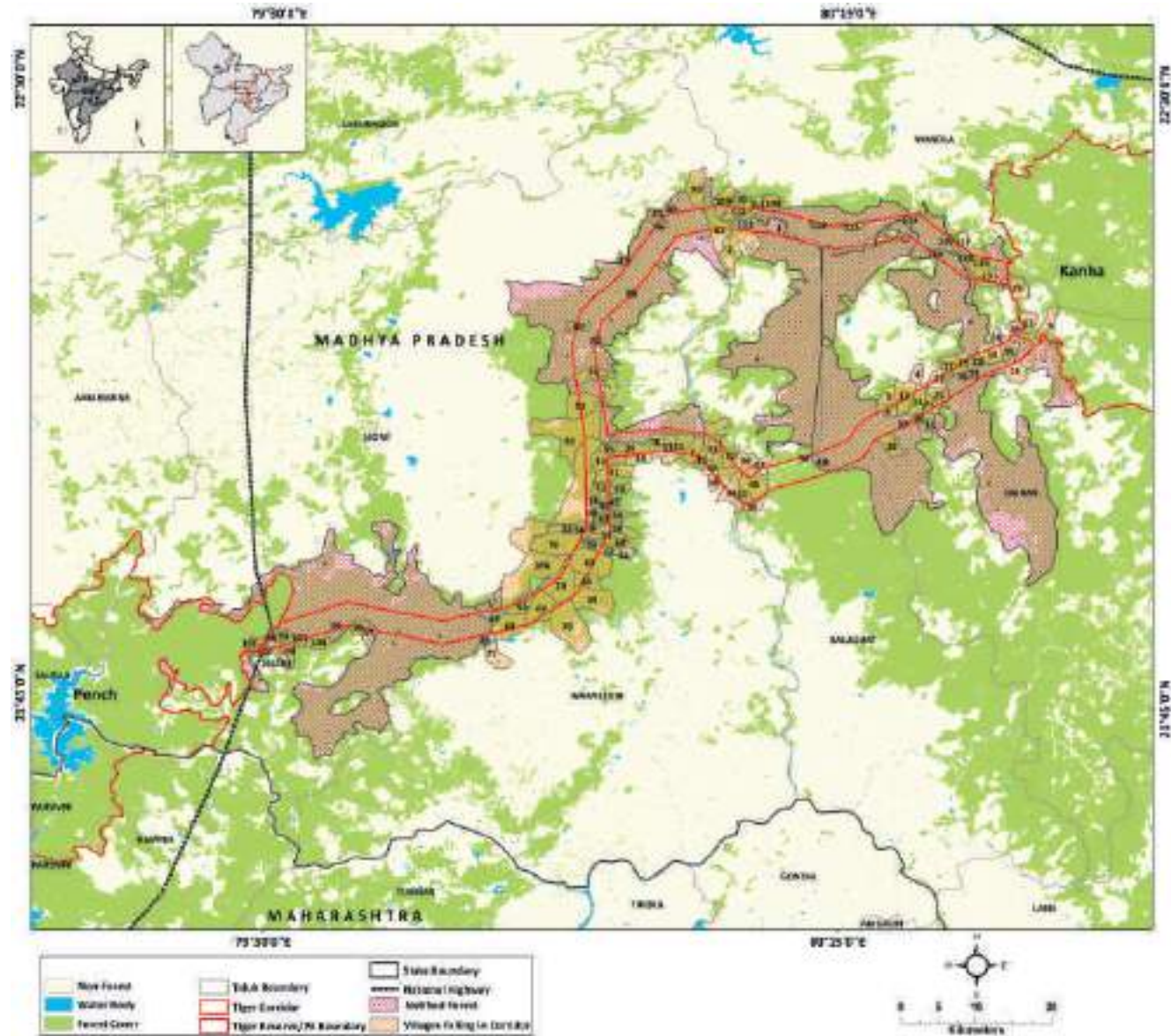


Figure 2.24: Least Cost Pathway corridor for Tiger movement between Kanha-Pench overlaid with village map (the village numbers are referenced in Table 2.6)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Madhya Pradesh	Balaghat	Balaghat	F.v.(1) Kota	18	85	28	121
2			Balaghat	Padriganj	232	955	273	1133
3			Baihar	Bariya	118	551	167	737
4			Baihar	Pondi	264	1152	361	1494
5			Baihar	Dorli	66	280	77	376
6			Baihar	Salhe	32	126	34	159
7			Waraseoni	Selwa	161	915	260	966
8			Waraseoni	Khairgondi	48	233	53	245
9			Baihar	Akashmiri	87	419	121	494
10			Baihar	Sandha	93	433	114	597
11			Waraseoni	Bhandamurri	368	1783	532	1992
12			Baihar	Chini	264	1329	318	1552
13			Baihar	Fatehpur Ryt.	22	111	36	144
14			Waraseoni	Chawarpani	2	9	7	27
15			Baihar	Charegaon	120	586	158	730
16			Baihar	Tirgaon	127	571	169	668
17			Baihar	Majgaon Mal.	122	624	168	702
18			Baihar	Korja	234	1199	277	1322
19			Baihar	Dhipur Ryt.	48	225	63	285
20			Baihar	Gararibahera	8	37	9	52
21			Baihar	Khursitola	29	130	36	113
22			Baihar	Jhiriya	137	603	190	768
23			Baihar	Bhada Mal.	141	690	188	869
24			Baihar	Bhidi	246	1283	360	1489
25			Baihar	Bagholi	296	1272	366	1450
26			Baihar	Fatehpurtheke	60	274	87	299
27			Baihar	Kukada	38	161	40	181
28			Baihar	Baroorgota	12	62	11	54
29			Waraseoni	Tengni Khurd	225	1045	307	1274
30			Waraseoni	Salebharri	139	620	170	785

Table 2.6:

Villages Within the Least Cost Pathway Corridor connecting Bandhavgarh-Achanakmar as shown in Fig. 2.24

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Waraseoni	Bagdehi	89	447	105	469
32			Balaghat	Chacheri	81	397	130	518
33			Waraseoni	Dohara	68	364	111	458
34			Waraseoni	Bandri	296	1500	396	1780
35			Waraseoni	Khairgaon	145	809	218	972
36			Balaghat	Laweri	78	372	92	399
37			Balaghat	Manpur	65	313	88	338
38			Balaghat	Katurli	10	58	21	86
39			Waraseoni	Katangihari	628	2952	804	3665
40			Baihar	Tikariya	24	120	39	177
41			Waraseoni	Kanjai	480	2165	606	2482
42			Waraseoni	Chhindlai	189	953	248	1079
43			Balaghat	Kategaon	147	716	198	848
44			Balaghat	Titwa	137	672	228	840
45			Waraseoni	Pipariya	223	1146	285	1330
46			Waraseoni	Dharawasi	200	956	323	1322
47			Waraseoni	Malgondi	2	6	2	4
48			Waraseoni	Gankheda	10	68	16	67
49			Waraseoni	Ranikuthar	194	988	261	1055
50			Balaghat	Dongarbodi	53	251	67	270
51			Balaghat	Hirmutola	52	246	71	264
52			Waraseoni	Tekadi	161	818	234	905
53			Waraseoni	Pandhrapani	124	596	171	680
54			Waraseoni	Bagholi	429	2021	541	2149
55			Waraseoni	Mahurjhari	0	0	0	0
56			Waraseoni	Chichgaon	227	1135	277	1178
57			Waraseoni	Salhe	197	869	243	1020
58			Waraseoni	Bori	451	2139	613	2326
59			Waraseoni	Bahiyatikur	214	1022	247	1077
60			Waraseoni	Marhera	127	683	176	686



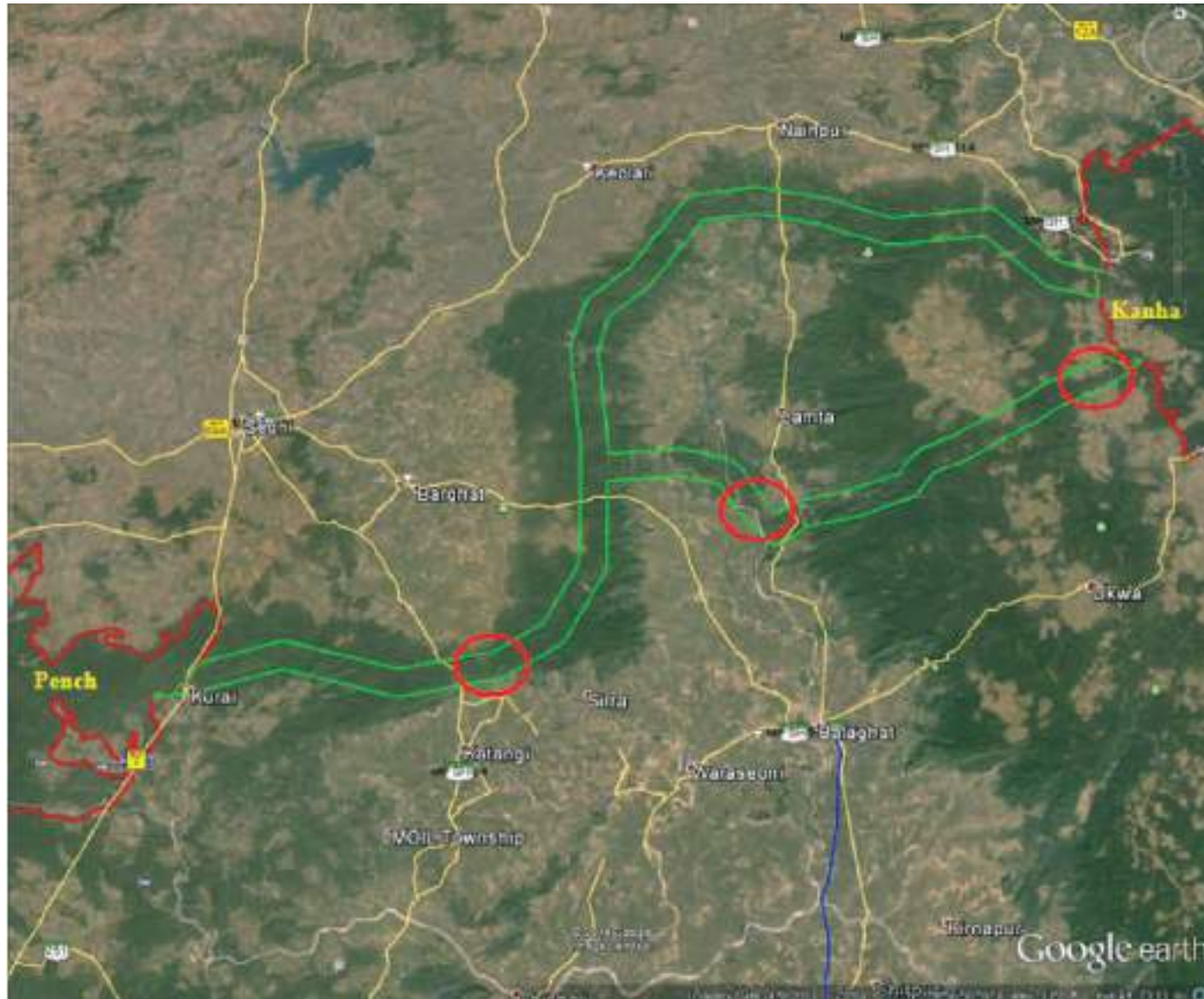
Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
61			Waraseoni	Garapuri	116	569	137	598
62			Waraseoni	Khursodi	102	499	121	535
63			Waraseoni	Naitra	333	1642	424	1755
64			Waraseoni	Nagjhar	130	649	158	701
65			Waraseoni	Sirra	328	1471	397	1572
66			Waraseoni	Pipariya	309	1455	285	1330
67			Waraseoni	Botejhari	411	2138	529	2286
68			Waraseoni	Nandgaon	322	1488	444	1733
69			Waraseoni	Tekadi	417	2050	507	2403
70			Waraseoni	Budbuda	906	4391	1134	4867
71			Katangi	Sirpur	511	2265	601	2510
72			Balaghat	F.v.(4) Pandhra Tola	0	0	0	0
73			Waraseoni	Kuwagarh	0	0	0	0
74			Baihar		0	0	0	0
75			Baihar	Narna	151	676	171	751
76			Baihar	Pongarjhodi	166	803	225	991
77			Baihar	Dalwada	60	233	80	290
78			Waraseoni		0	0	0	0
79			Waraseoni		0	0	0	0
80			Baihar		0	0	0	0
81			Katangi	Tekadi	182	835	223	987
82		Seoni	Keolari	Payli Jar	0	0	0	0
83			Keolari	Khair Ranji	274	1457	438	1700
84			Keolari	Potalpani	60	276	61	289
85			Keolari	Turga	55	303	82	367
86			Keolari	Tendu Tola Ryt	52	226	79	278
87			Keolari	Chirai Dongari Ryt	18	111	32	125
88				F3 Gaurjholopani	0	0	0	0
89			Keolari	Muchche Dobri Ryt	0	0	0	0
90			Keolari	Pipardaun	71	309	84	367

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
91			Keolari	Taktua	68	298	76	392
92			Barghat	Pandharapani	29	150	47	185
93			Barghat	Keshlai	37	155	59	235
94			Kurai	F5 Bawanthaeli	17	77	22	98
95			Kurai	Kurai	375	1696	464	1927
96			Kurai	Chandarpur	69	330	88	371
97			Kurai	Beesapurtyt	97	336	106	436
98			Kurai	Pindkapar	468	2044	501	2090
99			Kurai	Bormara	74	371	105	466
100			Kurai	Pindrai	128	559	145	671
101			Kurai	Raiyarao	78	359	91	341
102			Kurai	Kodajhirityt	153	755	196	849
103			Kurai	Harduli	68	314	69	305
104			Kurai	Bichuwaryt	25	136	15	73
105			Kurai	Dungariya	0	0	0	0
106			Barghat	F.v.(4)bijajhola	0	0	0	0
107		Mandla	Bichhiya	Pondi	95	427	113	507
108			Nainpur	Chichgaon	275	1241	320	1395
109			Nainpur	Gonjhi	225	1078	257	1224
110			Nainpur	Bijegaon	106	445	139	525
111			Nainpur	Kohka	83	378	110	455
112			Nainpur	Keregaon	133	650	168	779
113			Nainpur	Patadeh	81	387	95	438
114			Nainpur	Silwani	62	306	82	339
115			Nainpur	F 3 Turur Fv	46	227	63	253
116			Nainpur	F 4 Patwahi Fv	18	91	28	116
117			Bichhiya	Bagaspur	44	226	50	266
118			Nainpur	Bharweli [bharbheli]	103	466	146	579
119			Bichhiya	Surpati	86	380	112	468
120			Bichhiya	Dungariya	93	403	123	482
121			Bichhiya	Jhangul	98	394	118	435



Figure 2.25:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kanha-Pench



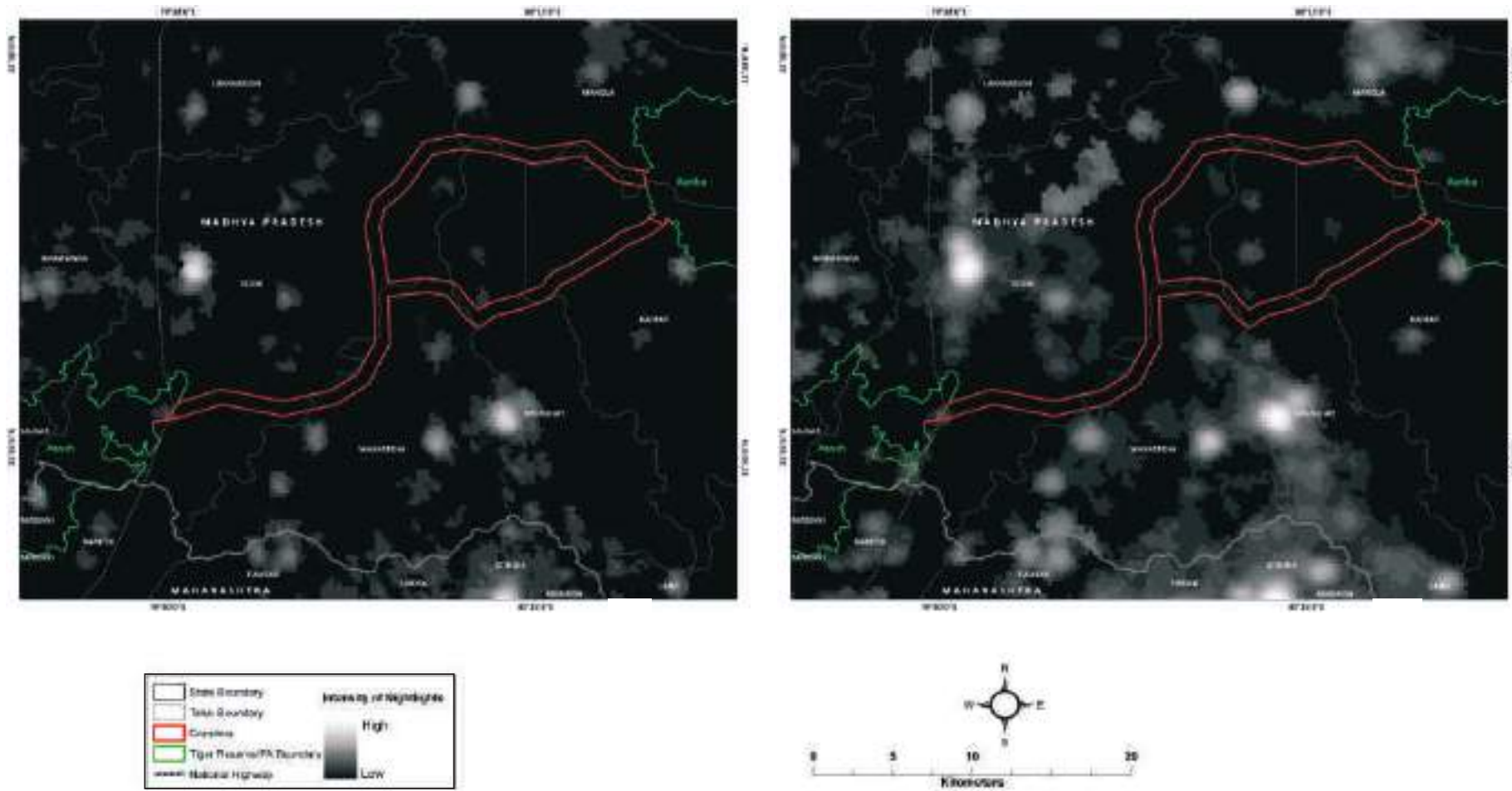


Figure 2.26:
Human habitation as depicted by nightlights within the Kanha-Pench Corridor landscape in the year 1992 and 2012

PENCH-SATPURA-MELGHAT

Figure 2.27:

Potential habitat connectivity for tiger movement between Pench-Satpura-Melghat as depicted by CIRCUITSCAPE model

1. Pench-Satpura

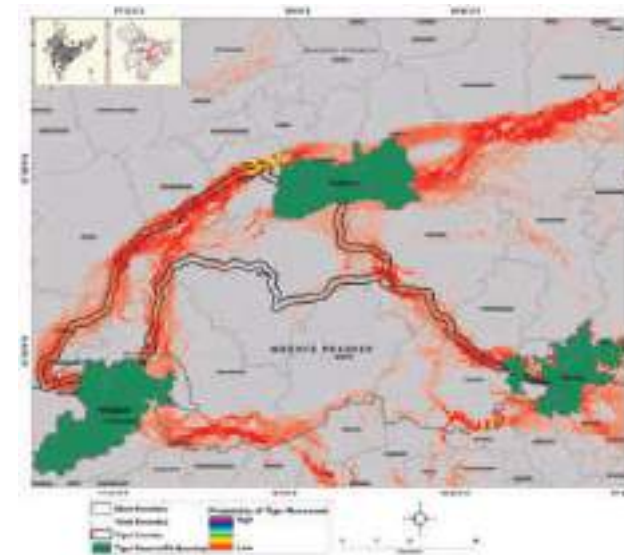
The habitat connectivity between Pench and Satpura is through fragmented forests interspersed with agriculture, human habitation, industrial development and mines. Yet genetic studies show that gene flow of tigers between Satpura and Pench still occurs. To safeguard this corridor for long term survival of both Pench and Satpura tiger populations restorative inputs and retrofitting of infrastructural development within this corridor is required. Part of this corridor near Satpura passes through the coal belt and is under intense pressure for mining. Infrastructure in the form of roads and railway lines that connect coal bearing region with industries need to have mitigative structures like over and under passes in the corridor habitat so as not to form linear barriers. Development of any sort should be discouraged within the corridor habitat.

2. Satpura-Melghat

This corridor is mostly through forested landscape of Hoshangabad, Betul and East Nimar and currently has low intensity agriculture and human density. It would be timely to safeguard this corridor and further development projects within this region should only be permitted with appropriate safeguards so as to maintain the functionality of the habitat as a viable corridor permitting gene flow of wild species between Satpura and Melghat.

3. Pench-Satpura

Part of this corridor is common with that of Pench-Satpura, which consists of degraded forest dispersed with various forms of human land uses like agriculture and mining. The habitat patch near Nawagaon is the weakest link in the corridor and would benefit from restorative inputs. Western part of the corridor is again through patchy ridge top forests but current landuse is not likely to be a barrier to tiger movement. Future development in this area should build in appropriate safeguards.

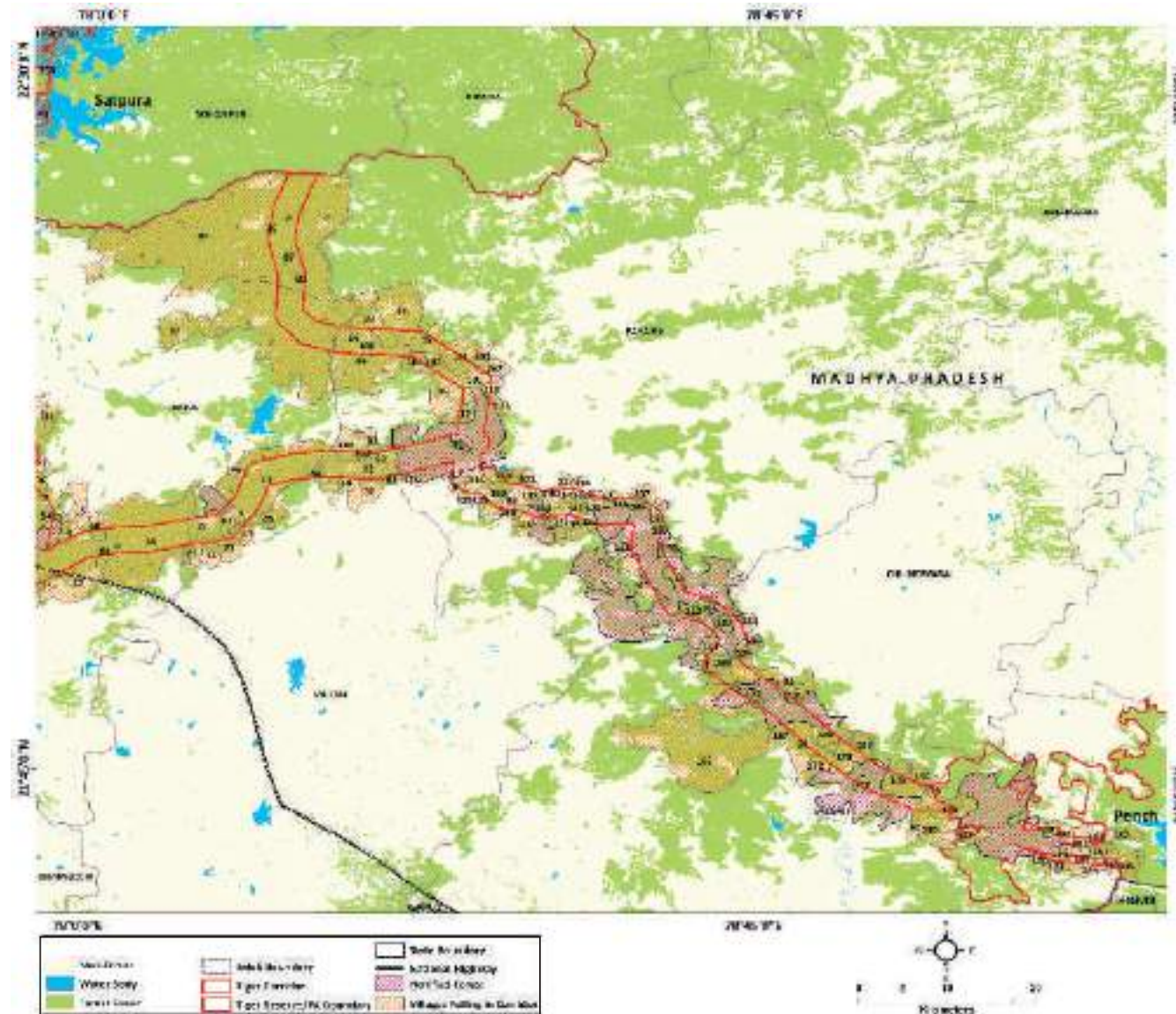


Pench-Satpura-Melghat

Habitat size	30687 Km ²
Source Population	Pench, Satpura and Melghat Tiger Reserve
Size of Source	(53-78) Pench (42-46) Satpura (30-39) Melghat
Protected Areas	Pench Satpura Melghat
Corridors	Pench-Satpura Satpura-Melghat

Figure 2.29:

Least Cost Pathway corridor for Tiger movement between Pench-Satpura-Melghat overlaid with village map (the village numbers are referenced in Table 2.7)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Madhya Pradesh	Betul	Betul	F.23 Bijadehi	31	163	46	191
2			Bhainsdehi	Hurra Malgajari (harra mal)	9	72	17	121
3			Betul	Khamalpur	95	534	124	667
4			Bhainsdehi	Harra (f.v)	76	542	120	666
5			Shahpur	Banka Bharda	66	367	87	413
6			Betul	Palaspani	103	595	118	612
7			Shahpur	Tara	304	1749	398	2083
8			Betul	Khara Gondi (kherigondi)	69	424	96	520
9			Shahpur	F.16 Baretha	133	711	178	860
10			Betul	Bod Ryt	113	690	156	815
11			Betul	F.22 Bakudviran	12	70	23	91
12			Amla	Bhaldehif.v	22	102	38	170
13			Amla	Thani	150	912	183	1032
14			Bhainsdehi	Chikhalda (f.v)	59	385	101	506
15			Betul	Ghodawadi	79	406	88	459
16			Betul	Padalda	47	265	57	290
17			Betul	Dolidhana	213	1332	325	1640
18			Shahpur	Chikhliyt	180	1054	300	1605
19			Betul	Kamtharyt	4	22	9	34
20			Shahpur	Matigarh	10	50	14	81
21			Betul	F.28 Arjungondi	9	64	21	110
22			Betul	Pachama	79	547	125	600
23			Betul	Bodi	172	922	250	1182
24			Betul	Harrai	120	686	149	827
25			Betul	Khedla	120	661	166	808
26			Betul	Churni	220	1280	301	1585
27			Betul	Kursanaf.v.(10)	85	487	138	648
28			Shahpur	F.5 Mendhakheda	60	307	79	431
29			Shahpur	Panda Jhiri	78	504	119	635
30			Shahpur	Tendukhedaryt	130	779	109	633

Table 2.7:

Villages within the Least cost Pathway Corridor connecting Pench-Satpura-Melghat as shown in Fig. 2.28, 2.29



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Shahpur	Tangnaryt	30	183	52	255
32			Shahpur	Khaprawadi	41	256	47	335
33			Shahpur	Kantawadi	84	499	134	585
34			Betul	Amapura (amapur)	34	210	68	290
35			Betul	Bancha	53	298	74	413
36			Betul	F.29 Banbodi	78	463	122	648
37			Shahpur	Kajli	86	538	125	714
38			Betul	Ajai	65	389	111	473
39			Shahpur	Deshawadi	362	2018	444	2351
40			Shahpur	F.8 Gudi Mai (gudhi)	32	150	49	213
41			Betul	Bhurbhur	24	138	35	178
42			Betul	Alamgarh	138	880	234	1002
43			Betul	Pipal Barra	134	787	219	978
44			Shahpur	Chirotiya	78	510	99	566
45			Shahpur	Chikhli Mal	81	463	108	572
46			Shahpur	Ghisibagla	341	2024	462	2479
47			Betul	Kamtha Mal	141	839	244	1067
48			Betul	Chirapatla	446	2528	665	3194
49			Betul	Malseoni	172	1059	245	1303
50			Amla	Kalmeshwara	335	1847	464	2246
51			Betul	Chopna	80	441	122	580
52			Betul	Gatakhedaryt	107	581	146	717
53			Amla	Thuthamahf.v (thuthama)	30	169	38	207
54			Betul	F.26 Dharakhoh	20	131	28	145
55			Betul	Sajpurf.v.(2)	22	123	36	156
56			Amla	Bisighat	22	123	37	189
57			Betul	Khokra	133	762	193	954
58			Bhainsdehi	Lapa (f.v)	46	284	72	418
59			Amla	Kachhar	95	552	126	653
60			Betul	Pajhar	28	168	39	208

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
61			Betul	Belond	135	702	163	937
62			Betul	Rojhada	84	431	108	555
63			Amla	Bichchhu Khan F.v	60	342	72	425
64			Betul	F.27 Sihari	47	243	49	234
65			Amla	Khadepipriyart.	66	431	119	621
66			Bhainsdehi	Chakdhanaraiyat	76	512	126	641
67			Amla	Khariyawani Mal	179	960	211	1146
68			Bhainsdehi	Doda Jam	154	995	273	1299
69			Bhainsdehi	Ghorpad Mal	91	687	171	911
70			Bhainsdehi	Ghorpadraiya	16	113	24	162
71			Amla	Khateda	93	522	114	655
72			Amla	Khatgarh	7	51	21	120
73			Bhainsdehi	Tingariya (tigariya)	87	666	171	914
74			Bhainsdehi	Dhakna	63	384	78	511
75			Betul	Rathipur	164	824	214	992
76			Bhainsdehi	Dhengna	90	641	144	922
77			Bhainsdehi	Palanga (f.v)	27	250	59	311
78			Bhainsdehi	Utari	117	915	231	1204
79			Bhainsdehi	Bijori	60	359	89	475
80		Chhindwara	Jamai	Bhardagarh	228	1371	366	2006
81			Jamai	Mendka	38	258	59	319
82			Jamai	F.v.5 Padar	74	369	112	634
83			Jamai	Badnoor	250	1203	269	1198
84		Betul		Garadehif.v.(4)	Na	Na	Na	Na
85			Betul	F.11 Sakmandiviran	Na	Na	Na	Na
86				F.4 Sakpandu	Na	Na	Na	Na
87				F.21 Dhanwarviran	Na	Na	Na	Na
88			Betul	F.15 Bhandarpaniviran	Na	Na	Na	Na
89				F.10 Silapativiran	Na	Na	Na	Na
90			Betul		Na	Na	Na	Na



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
90					Na	Na	Na	Na
90		Chhindwara	Bichhua		Na	Na	Na	Na
90			Sausar		Na	Na	Na	Na
90			Sausar		Na	Na	Na	Na
90		Hoshangabad			Na	Na	Na	Na
90					Na	Na	Na	Na
92		Chhindwara	Jamai	Gurrekhurai Mau	93	550	144	758
93			Chhindwara	Kalathuni	140	713	143	708
94			Jamai	Jamairyt.	35	184	48	231
95			Jamai	Tandsi	16	94	29	141
96			Jamai	Satijhiri	16	93	37	227
97			Jamai	Batri	127	665	152	882
98			Jamai	Dhobe	60	373	149	930
99			Jamai	Khumkal	103	591	135	871
100			Jamai	Talkhamra	30	169	60	295
101			Jamai	Bhatodiya Kalan	171	1001	243	1217
102			Jamai	Tekadhana	126	768	169	976
103			Jamai	Karanji	34	198	45	223
104			Jamai	Dhau	232	1341	300	1688
105			Jamai	Chikatbarri	67	350	77	382
106			Jamai	Bakhari	56	354	87	568
107			Jamai	Chandniyakoylawadi	80	458	144	622
108			Jamai	Lakhapur	14	82	28	109
109			Jamai	Rakhikol	628	3105	482	2181
110			Jamai	Dungariya	288	1404	305	1415
111			Jamai	Churnichougan	86	487	128	602
112			Jamai	Pindai Kalan	124	652	113	588
113		Chhindwara		Bhudhena	125	587	152	795
114			Jamai	Baliyamautandi	183	918	275	1189
115			Jamai	Nawegaon Kalan	99	544	180	771

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
116			Jamai	Bhordehikhurd	73	437	102	518
117			Jamai	Nirama	58	295	82	402
118			Jamai	Bakol	71	398	126	585
119			Chhindwara	Govindwari Mal	153	879	220	1105
120			Chhindwara	Pardhanghogri	180	997	222	1161
121			Chhindwara	Deep	60	356	83	467
122			Chhindwara	Deogarh	130	654	174	774
123			Bichhua	Niwari	69	397	81	412
125			Jamai	Dodasemar	153	923	181	894
126			Jamai	Roradhekni	80	424	103	572
127			Jamai	Pipariyaganu	104	625	158	737
128			Jamai	Sindrainadho	94	619	133	776
129			Chhindwara	Umardoh	170	1000	212	1266
130			Parasia	Tandiry.	65	348	73	434
131			Chhindwara	Junapaniry.	25	172	48	231
132			Bichhua	Dudhgaon	214	1150	256	1279
133			Chhindwara	Machhera	244	1401	342	1887
134			Chhindwara	Kalkot	97	593	152	700
135			Jamai	Sohagi	32	183	51	253
136			Jamai	Surnadehiry.	51	242	74	410
137			Parasia	Sindaraiguraiyathar	200	1063	241	1501
138			Jamai	Jambakiradi	193	1107	266	1331
139			Jamai	Barelipar	60	353	80	422
140			Jamai	Umarghodkhurd	97	556	116	613
141			Jamai	Katkuhi	165	846	238	1201
142			Jamai	Bhimsaniry.	9	58	11	57
143			Jamai	Panara	73	357	94	510
144			Jamai	Karanjei	25	147	35	215
145			Parasia	Pachdhar	69	323	99	368
146			Jamai	Gujarghat	127	740	155	923



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
147			Parasia	Sindairiyt.	133	796	163	899
148			Jamai	Mohgaonkisan	148	820	195	913
149			Jamai	Durgwada	66	368	89	461
150			Jamai	Madni	70	379	82	385
151			Parasia	Thawaribapu	63	379	81	476
152			Jamai	Parwatghoghri	166	1050	259	1214
153			Chhindwara	Kundai	69	415	109	604
155			Bichhua	Mohpani Mal.	144	742	185	830
156			Bichhua	Sanwari No.2	155	949	231	1114
157			Bichhua	Devvari	195	990	239	1080
158			Bichhua	Jamuniyakhurd	106	520	119	592
159			Chhindwara	Belkhera	151	834	180	997
160			Chhindwara	Bhawariyt.	93	586	142	757
161			Chhindwara	Mehlaribakol	162	943	217	1251
162			Chhindwara	Lohangi	246	1193	313	1335
163			Chhindwara	Shankarpur	84	501	110	558
164			Chhindwara	Matiadoh	97	549	129	682
165			Chhindwara	Govindwariryt.	40	222	49	244
166			Pandhurna	Narayan Ghat F.v.1	54	263	65	336
167			Pandhurna	Chhindboh	92	482	103	576
168			Chhindwara	Ambajhiri	166	934	245	1095
169			Chhindwara	Lans	113	660	153	725
170			Chhindwara	Sillewani	172	954	263	1188
172			Sausar	Khapa	275	1285	283	1262
173			Chhindwara	Bhiropani	67	347	83	395
174			Bichhua	Dundaseoni	59	313	93	414
175			Bichhua	Mohpanibisa	40	221	50	239
177			Sausar	Nauthal	106	516	127	608
178			Bichhua	Khadabeli	177	950	211	984
180			Bichhua	Bhimal Gondi	49	234	59	236

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
181			Bichhua	Gadhewani	122	575	146	631
182			Bichhua	Khamarpani	395	1875	529	2325
183			Bichhua	Kanhargaon	132	655	145	683
184			Bichhua	Paniyari	116	619	156	688
185			Bichhua	Thuepani	159	879	190	911
186			Bichhua	Sirapani	86	454	114	613
188			Bichhua	Dholpur	104	571	136	700
193		East Nimar	Harsud	Palaspur (f.v)	28	195	44	275
194		East Nimar	Harsud	Ghutighat	84	450	125	640
195		Harda	Timarni	Badwani(f.v.1)	97	600	152	810
196			Timarni	Donng(f.v.22)	19	114	28	186
197		Hoshangabad	Itarsi	Babaikhurd	111	618	149	800
198		Harda	Timarni	Jawarda(f.v.21)	51	310	68	415
199			Timarni	Amba (f.v.4)	39	273	61	360
200			Timarni	Gangradhana(f.v.3)	47	366	61	518
201			Timarni	Lodhidhana(f.v.13)	116	807	174	1049
202			Timarni	Banshipura(f.v.24)	44	352	73	500
203			Timarni	Indpura(f.v.35)	71	553	125	834
204			Timarni	Rawang	207	1379	302	1743
205			Timarni	Keli	131	896	234	1292
206			Timarni	Jhirna(f.v.17)	99	641	137	831
207			Timarni	Lakhadeh(f.v.40)	64	482	98	585
208		Hoshangabad	Itarsi	Piparia Kalan	62	327	76	434
209			Seoni-malwa	Sirupura	41	192	50	258
210			Seoni-malwa	Morghat	67	359	99	482
211			Seoni-malwa	Palasi(f.v.1)	41	253	75	373
212			Seoni-malwa	Lahi	91	525	101	564
213			Seoni-malwa	Samardha	82	488	113	595
214			Seoni-malwa	Kamtha	82	507	125	675
215			Seoni-malwa	Gidkheda(f.v.2)	27	180	56	269



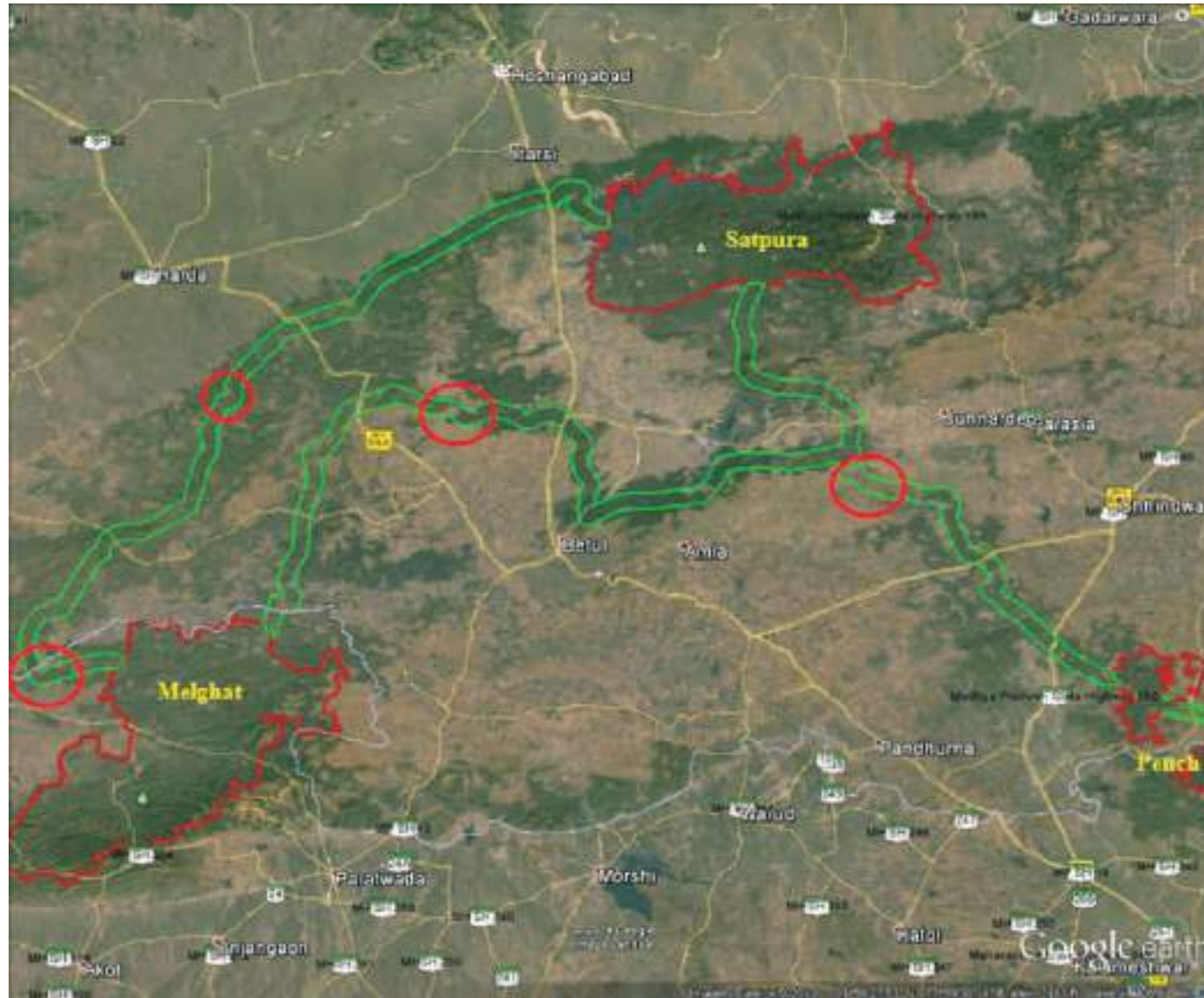
Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
216			Seoni-malwa	Amakatar(f.v.3)	32	208	63	310
217			Itarsi	Kiratpur	82	383	111	472
218			Itarsi	Kandai Kalan	117	622	147	777
219			Itarsi	Jamaidamami	30	153	51	218
220			Itarsi	Karkhajamai	41	117	51	162
221			Seoni-malwa	Narri	79	457	108	595
222			Seoni-malwa	Keolajhir	66	386	86	430
223			Itarsi	Jhirmau	104	516	136	596
224			Seoni-malwa	Bandi	64	362	85	491
225			Itarsi	Pandri	120	751	235	1184
226			Itarsi	Dob	87	403	110	463
227			Itarsi	Mohala	38	216	65	313
228			Itarsi	Kaveli	1	1	2	7
229			Itarsi	Jamani	343	1879	345	2036
230			Seoni-malwa	Chandakhad	73	397	96	444
231			Itarsi	Kasda Kalan	8	47	10	56
232			Seoni-malwa	Jatamau(f.v.5)	33	179	50	235
233			Seoni-malwa	Gotabbarri	47	265	62	324
234			Itarsi	Sonthia	84	459	101	485
235			Seoni-malwa	Salai	43	266	59	318
236			Itarsi	Temlakhurd	21	104	23	117
237			Itarsi	Tangna	139	832	225	1248
238			Itarsi	Dhaikhurd	159	917	222	1048
239			Itarsi	Amjhira	70	389	90	517
240			Itarsi	Nazarpur	87	397	96	464
241			Itarsi	Khatama	73	415	95	496
242			Itarsi	Jhalpa	9	48	11	62
243			Itarsi	Parchha	100	559	90	494
244			Seoni-malwa	Batki Alias Iklani	203	1044	269	1295
245			Seoni-malwa	Borkunda	105	507	116	567

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
246			Seoni-malwa	Jondhal	52	288	62	311
247			Seoni-malwa	Sotachikhali	95	506	142	690
248			Seoni-malwa	Pipalthon	162	967	234	1135
249			Seoni-malwa	Pipaliya Kalan	441	1997	525	2304
250			Seoni-malwa	Mahuadhana	119	637	185	979
251				Khohri	Na	Na	Na	Na
252				Kishanpur	Na	Na	Na	Na
253				Budimai(f.v.14)	Na	Na	Na	Na
254				Patlai Alias Sultanpur	Na	Na	Na	Na
255				Manamau	Na	Na	Na	Na
256				Jilwani	Na	Na	Na	Na
257				Kotra	Na	Na	Na	Na
258				Jujadeh	Na	Na	Na	Na
259				Amabad	Na	Na	Na	Na
260				Ratakans	Na	Na	Na	Na
261			Itarsi	Ordinance Factory Itarsi	2255	10259	1883	7878
263				Khudamba (f.v.13)	Na	Na	Na	Na
266				Ranipura (tawanagar)	Na	Na	Na	Na
267		Chhindwara	Jamai	Kali Chhapar	2119	10692	Na	Na
268		Hoshangabad	Itarsi	Chichadhan(f.v.12)	6	41	Na	Na
269	Maharashtra	Amravati	Chikhaldara	Ektai	112	782	176	1087
271			Chikhaldara	Karanjikheda	106	641	134	685
272			Dharni	Bulungavhan	63	368	92	589
273			Dharni	Katkumbha	68	354	120	666
274			Dharni	Chatwabod	191	1148	261	1416
275			Dharni	Kekada	120	621	198	944
276			Dharni	Hatnada	55	264	64	321
278			Dharni	Dhakarmal	125	940	184	1298
279			Dharni	Chethar	72	405	97	579
280			Dharni	Dharanmahu	237	1214	360	1766



Figure 2.30:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Pench-Satpura-Melghat



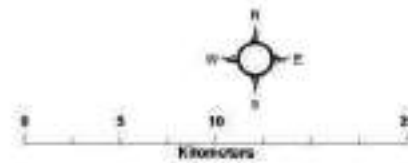
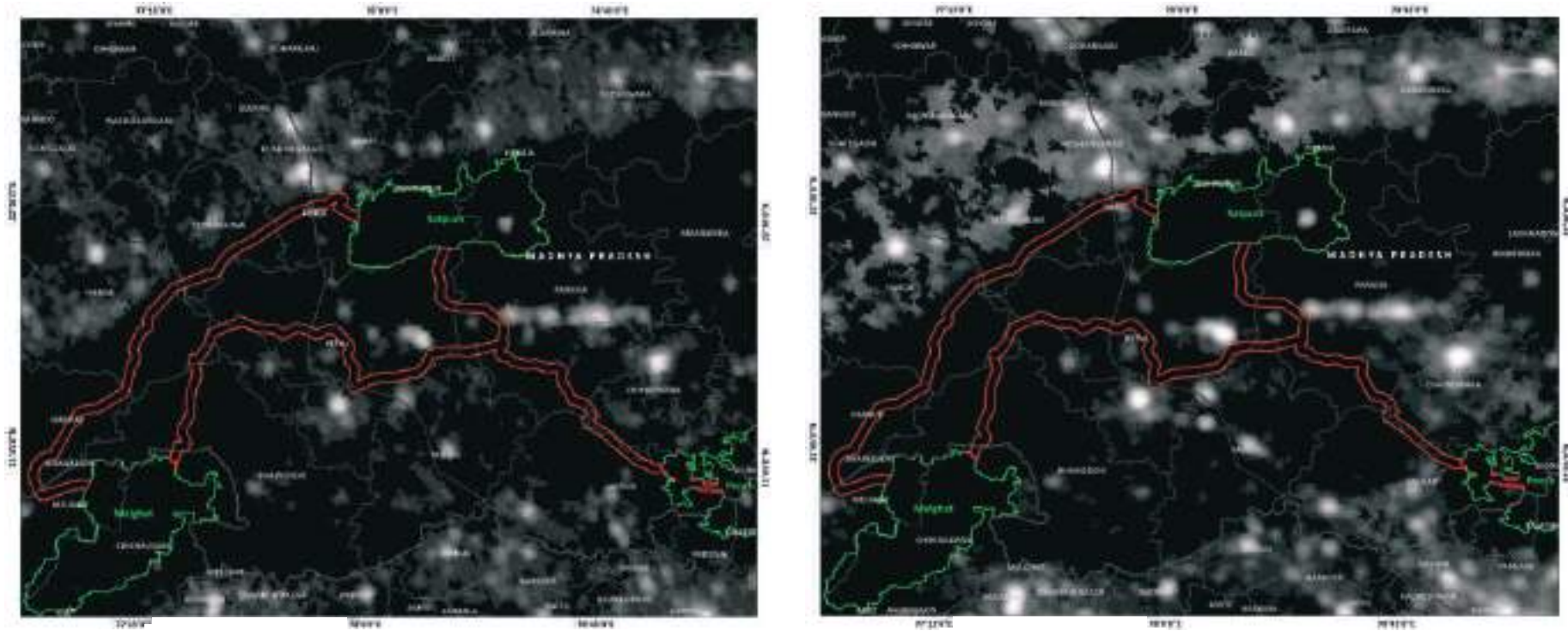


Figure 2.31:
Human habitation as depicted by nightlights within the Pench-Satpura-Melghat Corridor landscape in the year 1992 and 2012

KANHA TO NAVEGAON-NAGZIRA-TADOBA-INDRAVATI

Figure 2.32:

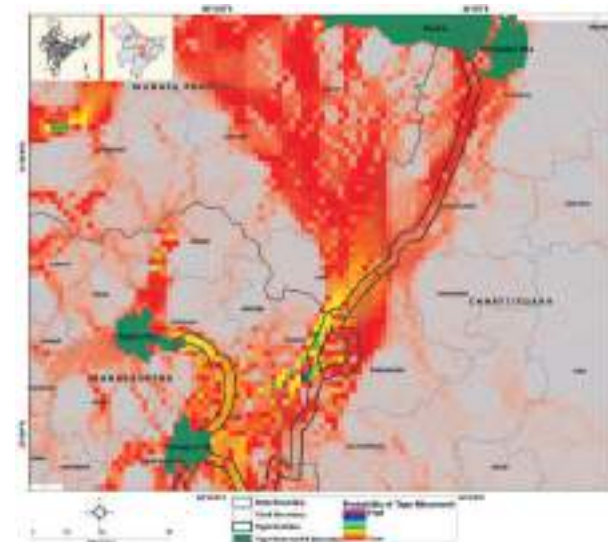
Potential habitat connectivity for tiger movement between Kanha-Navegaon-Nagzira Corridor as depicted by CIRCUITSCAPE model

The Balaghat forests and forests along the border of Chhattisgarh connect the Kanha tiger population to the southern tiger populations of Maharashtra (Nagzira-Navegaon and Tadoba) and with Indravati-Northern Andhra Pradesh (Kawal). The corridor is weakest at the three state junction of Madhya Pradesh-Maharashtra and Chhattisgarh where the forest connectivity is only in the form of fragmented patches interspersed with agriculture and small residential hamlets. The corridor in Maharashtra is fragmented but the landscape matrix is not entirely hostile to tiger movement and gene flow currently exists under the prevalent landuse land cover. However, this landscape matrix is under pressure from mining and irrigation/power projects and ground validation to fine tune the corridor is essential for keeping this connectivity functional. Development in this area needs to build in appropriate mitigation measures so as not to compromise on the conservation values of the region.

The corridor towards Indravati in the south continues in the forest that persists on the border of Maharashtra and Chhattisgarh. A weak link exists near the Dina-Dam and reservoir of Regadi village where agriculture and irrigation project activities are likely to restrict wildlife movement. Further development here would result in barriers to movement. National highway 6 and state highway-6 intersect this corridor and appropriate safeguards are required to be built in to ensure that this linear infrastructure does not become a barrier to wildlife in the future.

The connectivity between Tadoba and Indravati as well as between Tadoba and Northern Andhra Pradesh Tiger populations is made up of forests fragments which are relatively intact and at times interspersed with agriculture. The corridor is weak at the agricultural patch on the banks of river Wardha in the tehsil of Sirpur.

The forest near Tadoba are on coal reserves and would always be under threat from mining. Care needs to be taken while granting approvals to mining projects so as to safeguard the corridor value of this habitat.



Kanha to Navegaon-Nagzira-Tadoba-Indravati

Habitat size	62090 Km ²
Source Population	Kanha and Tadoba
Size of Source	45-75 (Kanha) 66-74 (Tadoba- Chandrapur)
Protected Areas	Kanha Tiger Reserve Bhoramdev WLS Navegaon-Nagzira Tiger Reserve Tadoba-Andhari Tiger Reserve Indravati Tiger Reserve
Corridors	Kanha-Nagzira-Navegaon Nagzira-Navegaon-Tadoba Tadoba-Indravati Kanha-Indravati

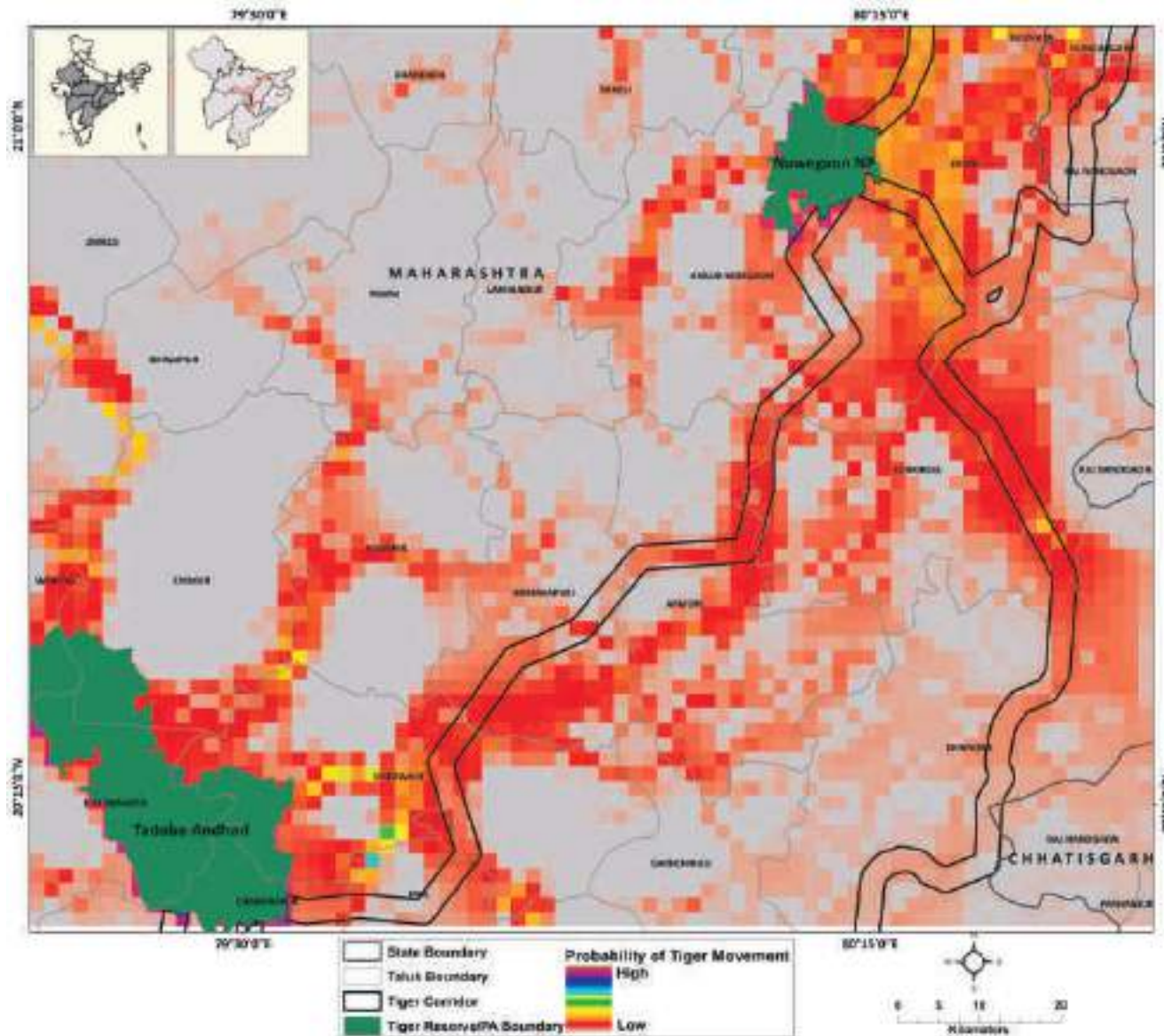
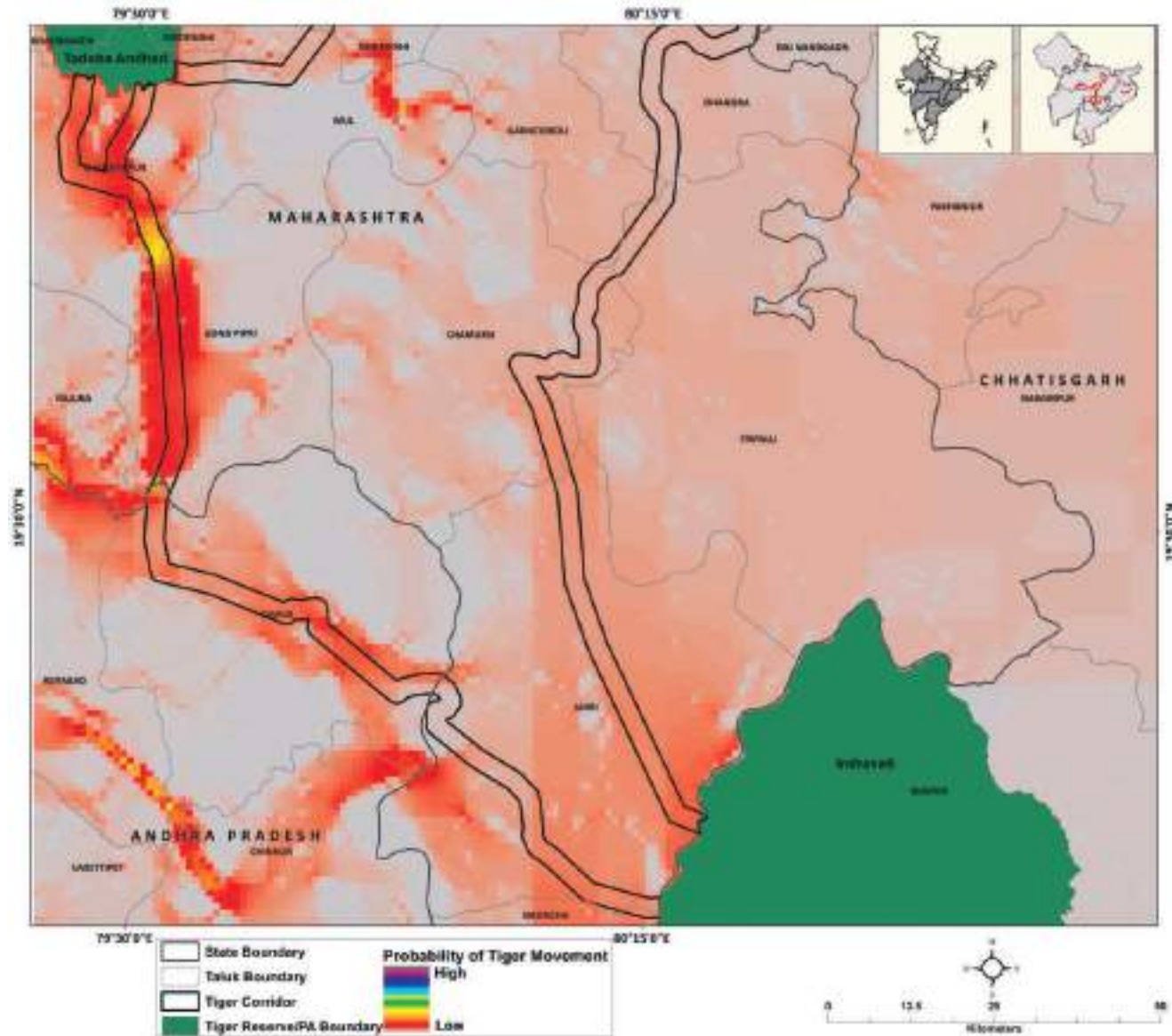


Figure 2.33:
Potential habitat connectivity for tiger movement between of Navegaon-Nagzira-Tadoba Corridor as depicted by CIRCUITSCAPE model

Figure 2.34:

Potential habitat connectivity for tiger movement between of Tadoba-Indravati Corridor as depicted by CIRCUITSCAPE model



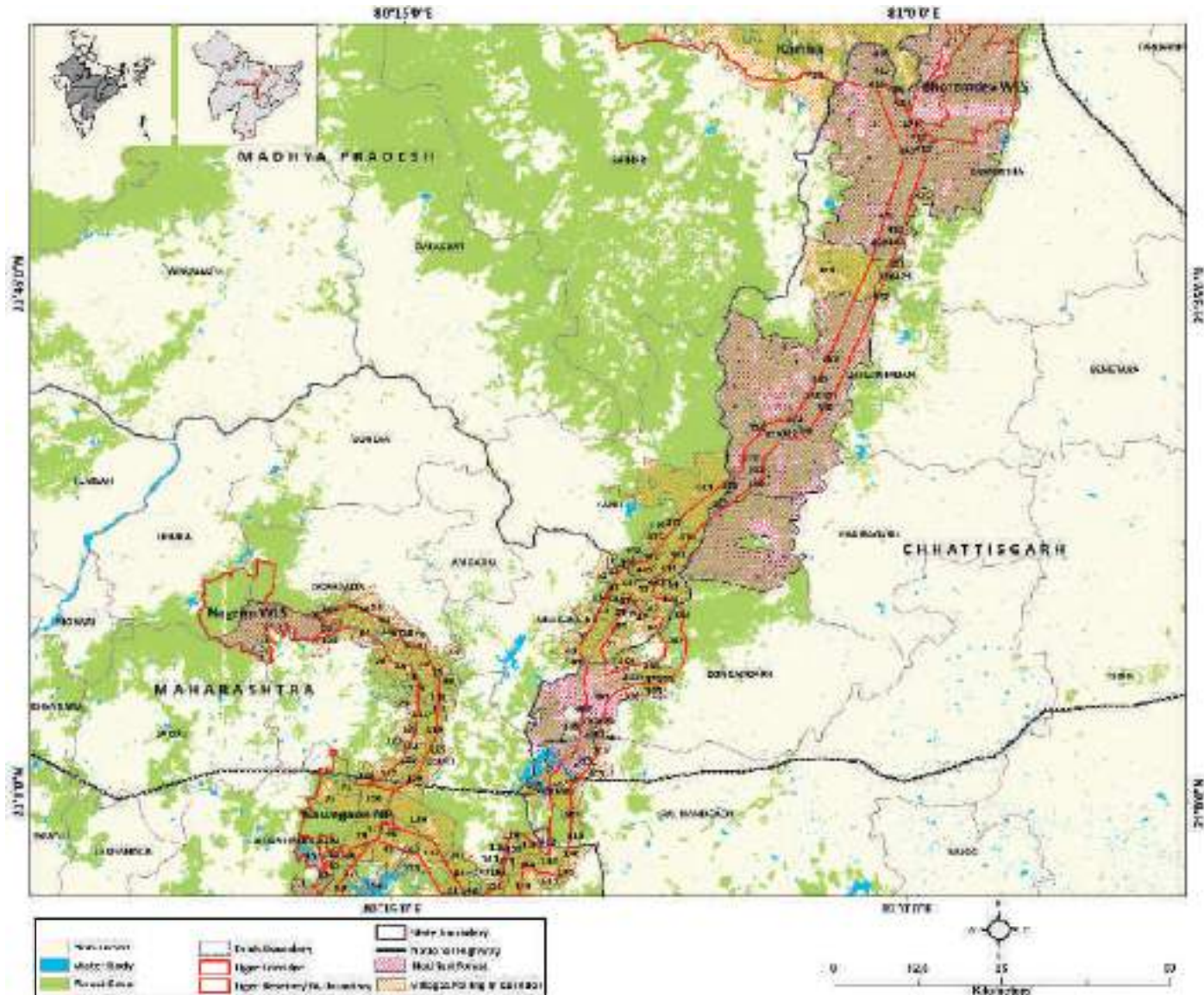
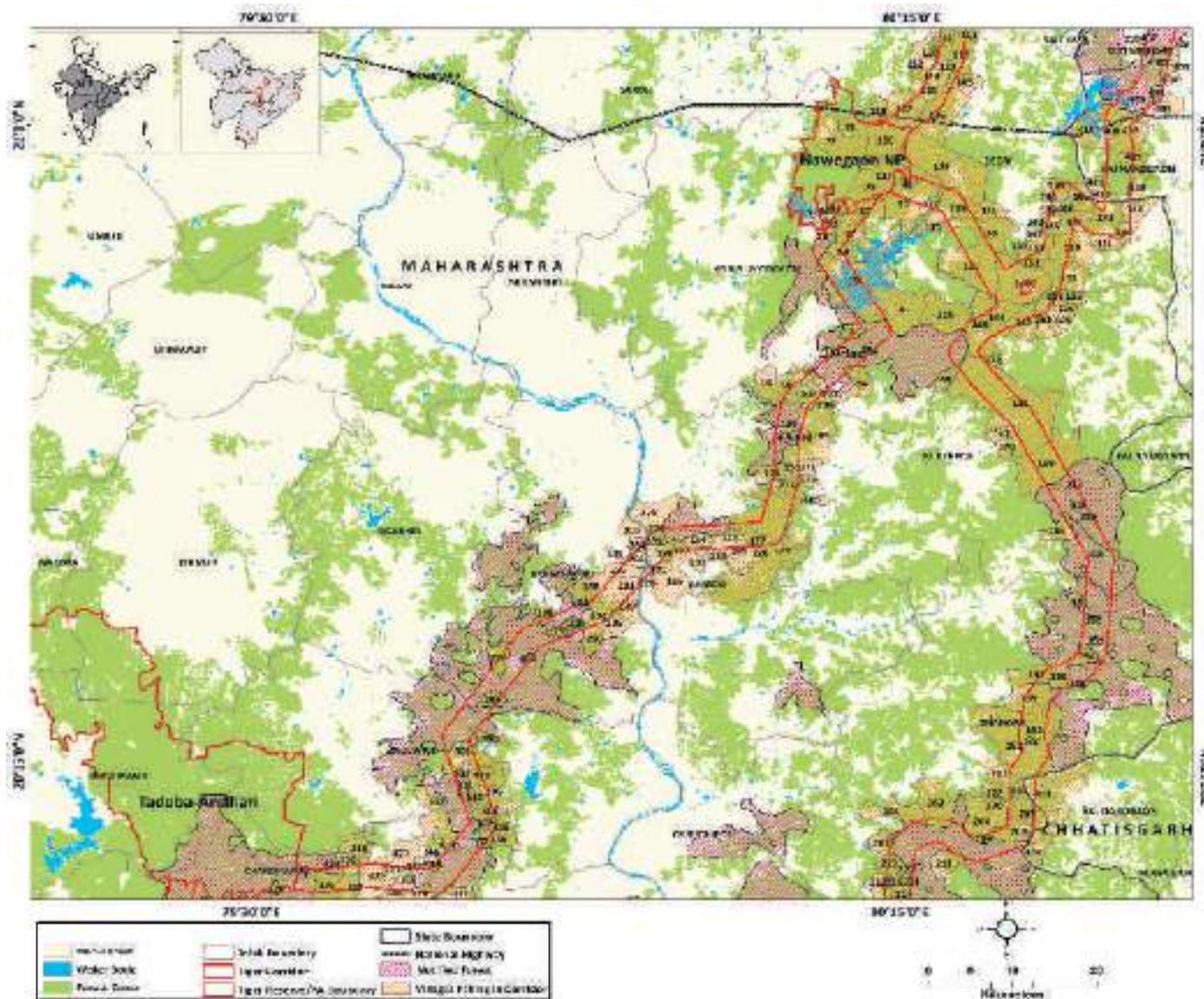


Figure 2.35:
Least Cost Pathway corridor for Tiger movement between Kanha-Navegaon-Nagzira overlaid with village map (the village numbers are referenced in Table 2.8)

Figure 2.36:

Least Cost Pathway corridor for Tiger movement between Navegaon-Nagzira-Tadoba overlaid with village map (the village numbers are referenced in Table 2.8)



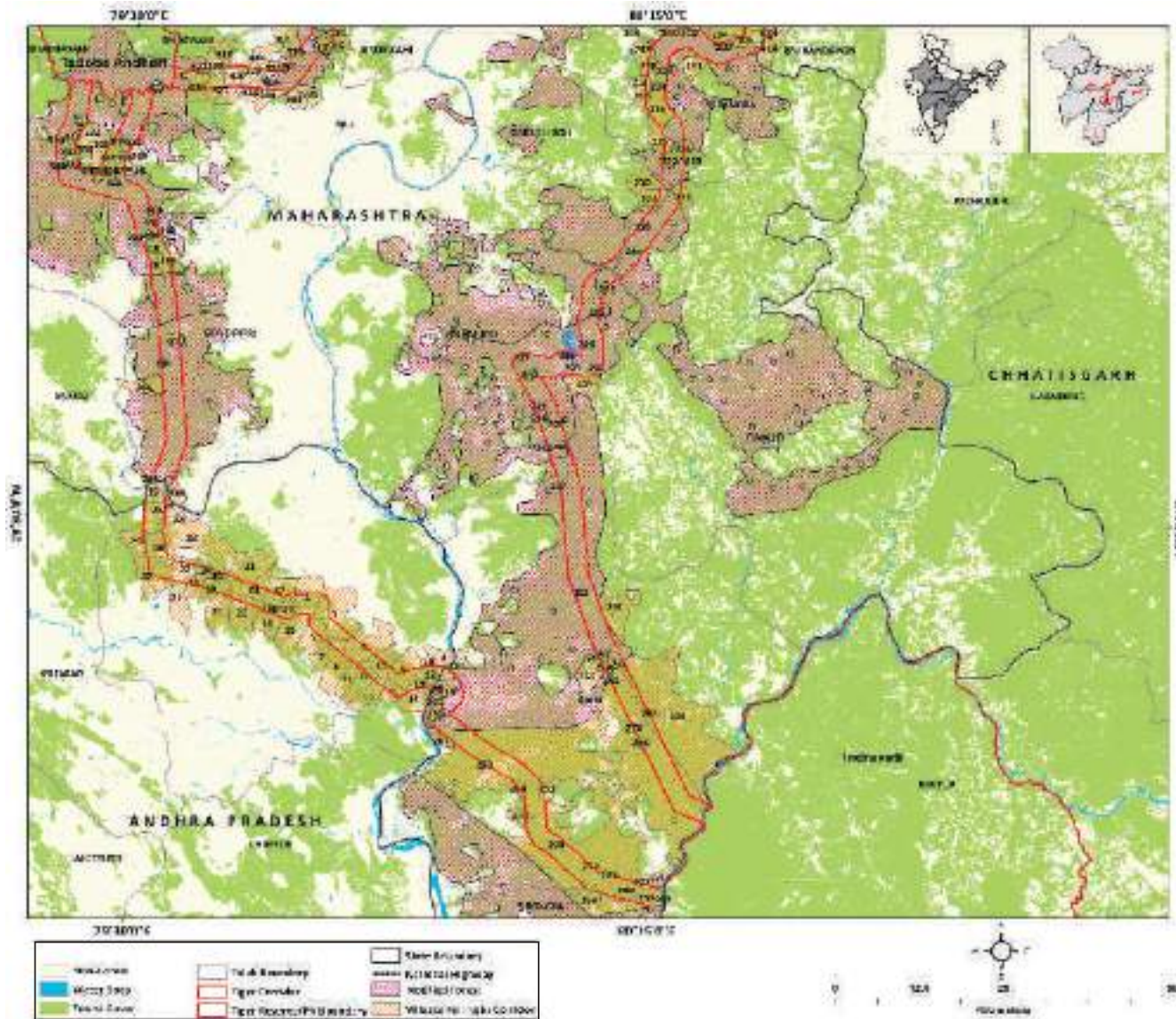


Figure 2.37:
Least Cost Pathway
corridor for Tiger
movement between
Tadoba-Indravati
overlaid with village
map (the village
numbers are
referenced in Table 2.8)

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Andhra Pradesh	Adilabad	Bejjur	Gundepalle	48	215	Na	Na
2			Bejjur	Rebbena	388	1813	Na	Na
3			Bejjur	Outsarangipalle	709	3696	Na	Na
4			Bejjur	Bejjur	1047	4990	Na	Na
5			Bejjur	Kondapalle	351	1545	Na	Na
6			Bejjur	Yellur	421	1970	Na	Na
7			Bejjur	Lodpalle	244	954	Na	Na
8			Bejjur	Somini	185	986	Na	Na
9			Bejjur	Papanpet	322	1574	Na	Na
10			Bejjur	Tikkapalle	26	102	Na	Na
11			Bejjur	Koyachichal	36	148	Na	Na
12			Bejjur	Talai	97	418	Na	Na
13			Bejjur	Agarguda	156	704	Na	Na
14			Bejjur	Muraliguda	100	449	Na	Na
15			Bejjur	Bhatpalle	Na	Na	Na	Na
16			Bejjur	Gannaram	Na	Na	Na	Na
17			Bejjur	Telapalle	Na	Na	Na	Na
18			Kagaznagar	Jankapur	101	404	Na	Na
19			Kagaznagar	Ankhoda	195	821	Na	Na
20			Kagaznagar	Kadamba	127	562	Na	Na
21			Kagaznagar	Mosam	513	2106	Na	Na
22			Kagaznagar	Nazrulnagar	1941	10924	Na	Na
23			Kagaznagar	Pothepalle	Na	Na	Na	Na
24			Sirpur (T)	Bonki	Na	Na	Na	Na
25			Sirpur (T)	Hudkili	Na	Na	Na	Na
26			Sirpur (T)	Jakkapur	Na	Na	Na	Na
27			Sirpur (T)	Makidi	Na	Na	Na	Na
28			Sirpur (T)	Navegaon	Na	Na	Na	Na
29			Sirpur (T)	Garlapet	Na	Na	Na	Na
30			Sirpur (T)	Cheelapalle	Na	Na	Na	Na

Table 2.8:

Villages within the Least cost Pathway Corridor between Kanha-Navegaon-Nagzira-Tadoba-Indravati as shown in Fig. 2.33, 2.34, 2.35, 2.36 and 2.37

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Sirpur (T)	Bhupalapatnam	Na	Na	Na	Na
32			Sirpur (T)	Vempalle	Na	Na	Na	Na
33			Sirpur (T)	Achalli	Na	Na	Na	Na
34			Sirpur (T)	Chintakunta	Na	Na	Na	Na
35			Sirpur (T)	Arepalle	Na	Na	Na	Na
36			Sirpur (T)	Chunchupalle	Na	Na	Na	Na
37			Sirpur (T)	Adepalle	Na	Na	Na	Na
38			Sirpur (T)	Sirpur (p)	Na	Na	Na	Na
39	Maharashtra	Gondiya	Salekasa	Darrekasa	75	339	80	397
40			Goregaon	Telankhedi	179	848	173	747
41			Goregaon	Garada	38	148	53	224
42			Salekasa	Banjari	124	622	125	629
43			Salekasa	Kular Bhatti	98	402	113	462
44			Sadak - Arjuni	Jambhali	230	1100	261	1178
45			Arjuni Morgaon	Palasgaon	152	658	158	742
46			Arjuni Morgaon	Dhamditola	135	707	147	793
47			Salekasa	Diwatesur	Na	Na	Na	Na
48			Goregaon	Zaliya	Na	Na	Na	Na
49			Goregaon	Jambhulpani	68	334	96	440
50			Goregaon	Tilli	250	1148	297	1289
51			Salekasa	Pipariya	530	2864	1025	3550
52			Salekasa	Gallatola	121	534	118	554
53			Salekasa	Dandhari	48	231	65	368
54			Salekasa	Murkudoh	98	396	95	522
55			Goregaon	Mundipar	643	2872	701	3052
56			Goregaon	Palewada	279	1294	284	1249
57			Salekasa	Daldalkuhi	52	221	56	279
58			Goregaon	Kalpathari	245	1167	295	1269
59			Goregaon	Sondlagondi	26	106	32	145
60			Salekasa	Nawatola	129	592	144	702



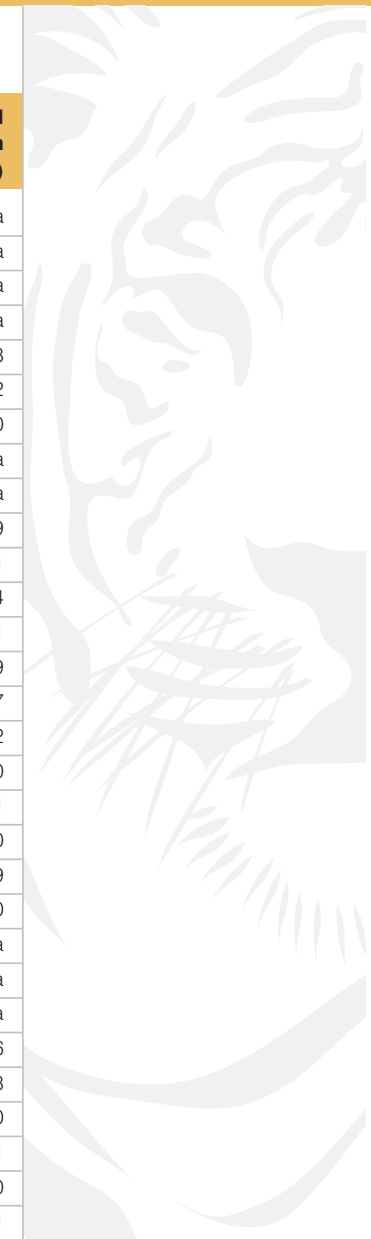
Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
61			Goregaon	Ghumarra	281	1359	318	1400
62			Salekasa	Kosamtarra	179	869	218	930
63			Salekasa	Dhanegaon	43	231	54	251
64			Salekasa	Toyagondi	122	644	132	631
65			Salekasa	Jamakudo	430	2135	445	1902
66			Goregaon	Murdoli	154	637	153	629
67			Goregaon	Palkheda	141	640	193	846
68			Goregaon	Mohagaon	316	1467	351	1581
69			Salekasa	Managad	87	335	138	614
70			Goregaon	Gowaritola	115	651	155	685
71			Salekasa	Kopalgad	165	763	195	984
72			Goregaon	Pipartola	146	652	186	817
73			Goregaon	Nimba	294	1289	313	1427
74			Sadak - Arjuni	Dodke	122	509	133	610
75			Goregaon	Alebedar	50	164	59	238
76			Sadak - Arjuni	Pandharwani	16	66	17	73
77			Sadak - Arjuni	Kawalewada	114	440	139	605
78			Sadak - Arjuni	Zankar Gondi	11	51	14	69
79			Arjuni Morgaon	Malkazari	1	5	Na	Na
80			Arjuni Morgaon	Chutiya	43	202	76	248
81			Arjuni Morgaon	Jambhali	149	653	171	703
82			Arjuni Morgaon	Pauni	243	1380	272	1395
83			Salekasa	Kamakazari	Na	Na	Na	Na
84			Salekasa	Gendurzariya	Na	Na	Na	Na
85			Deori	Singandoh	85	387	95	482
86			Arjuni Morgaon	Dhabetekadi	17	74	19	72
87			Arjuni Morgaon	Tidka	88	393	96	431
88			Arjuni Morgaon	Jabbarkheda	57	252	58	254
89			Deori	Alezari	Na	Na	Na	Na
90			Arjuni Morgaon	Yerandi	83	357	94	440

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
91			Deori	Ghogara	16	54	15	80
92			Arjuni Morgaon	Wadegaon Bandya	182	777	222	862
93			Arjuni Morgaon	Gawarra	134	643	161	711
94			Arjuni Morgaon	Junevani (Rai)	33	124	30	125
95			Arjuni Morgaon	Tirkhuri	22	79	26	95
96			Arjuni Morgaon	Varvhi	82	332	97	384
97			Salekasa	Maramjob	Na	Na	46	193
98			Goregaon	Pangadi	Na	Na	Na	Na
99			Sadak - Arjuni	Rengepar	207	912	231	1039
100			Sadak - Arjuni	Pandhari	565	2550	598	2487
101			Arjuni Morgaon	Jambhali (Gandhari)	35	109	32	105
102			Arjuni Morgaon	Umarpayali	31	109	42	126
103			Arjuni Morgaon	Tukum Narayan	160	654	173	695
104			Arjuni Morgaon	Dongargaon	14	50	12	47
105			Deori	Maramjob	225	989	241	991
106			Deori	Kosbi (BK)	73	457	69	324
107			Arjuni Morgaon	Ambhora	87	403	97	500
108			Arjuni Morgaon	Arattondi	102	418	123	477
109			Arjuni Morgaon	Dhamditola	136	663	151	782
110			Deori	Khamtalav	20	98	21	109
111			Deori	Zunzaritola	27	115	26	114
112			Sadak - Arjuni	Kohalipar	28	120	29	114
113			Salekasa	Tahkazari	Na	Na	Na	Na
114			Salekasa	Sirmalkasa	Na	Na	Na	Na
115			Salekasa	Kachargad	Na	Na	Na	Na
116			Goregaon	Rengepar	Na	Na	0	0
117			Arjuni Morgaon	Tumdimendha	Na	Na	Na	Na
118			Deori	Malkazari	Na	Na	Na	Na
119			Deori	Mundipar	45	216	46	248
120			Sadak - Arjuni	Koylari	191	873	207	795



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
121			Deori	Sukali	155	555	149	611
122			Sadak - Arjuni	Putli	231	996	245	1094
123			Sadak - Arjuni	Pradhantola N.V.	135	626	149	666
124			Sadak - Arjuni	Sahakepar	39	185	54	242
125			Sadak - Arjuni	Khurshipar	98	485	97	430
126			Deori	Masulkasa	121	612	139	583
127			Sadak - Arjuni	Khadki	171	868	213	1249
128			Sadak - Arjuni	Rajguda	152	735	172	727
129			Deori	Mhaisuli	139	894	145	970
130			Deori	Kodikasa	135	645	162	776
131			Deori	Dhawalkhedi	115	502	129	617
132			Deori	Sundari	107	502	136	624
133			Deori	Sarregaon	24	121	27	119
134			Deori	Gadegaon	165	744	182	788
135			Deori	Ghonadi	263	1238	333	1537
136			Deori	Belgaon	83	418	82	372
137			Deori	Bonde	123	589	152	605
138			Deori	Dhanori	18	94	21	107
139			Deori	Khambkhura	129	548	140	616
140			Deori	Tumadikasa	93	480	109	476
141			Deori	Kotijambhora	189	867	207	983
142			Deori	Mehatakheda	180	893	177	813
143			Deori	Kesori	148	742	166	812
144			Deori	Paulzola	176	747	204	716
145			Deori	Rehali	125	611	135	669
146			Deori	Wadekasa	47	279	64	311
147			Deori	Dongargaon	55	257	81	303
148			Deori	Piparkhari	138	594	125	603
149			Deori	Yedmagondi	190	905	236	1162
150			Sadak - Arjuni	Nishani	Na	Na	Na	Na

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
151			Deori	Pouni (Rithi)	Na	Na	Na	Na
152			Deori	Gawarra (Rithi)	Na	Na	Na	Na
153			Arjuni Morgaon	Water Body	Na	Na	Na	Na
154			Arjuni Morgaon	Water Body	Na	Na	Na	Na
155		Gadchiroli	Korchi	Bijapar	32	132	38	188
156			Korchi	Bodaldand	124	586	147	652
157			Armori	Palasgaon	300	1285	338	1400
158			Korchi	Pranpur (Rith)	Na	Na	Na	Na
159			Kurkheda	Halkikanhar	Na	Na	Na	Na
160			Korchi	Mayalghat	30	139	31	119
161			Korchi	Debari	51	246	71	251
162			Korchi	Padiyal Jog	32	171	40	144
163			Korchi	Charvidand	27	131	29	171
164			Korchi	Belar Gondi	42	240	53	219
165			Kurkheda	Khedegaon	133	569	148	637
166			Desaiganj (Vadasa)	Kasari Tukum	207	932	260	1022
167			Kurkheda	Yerkadi	78	391	108	430
168			Kurkheda	Gewardha	401	1737	453	1771
169			Korchi	Gadheli (Masahat)	10	57	12	50
170			Kurkheda	Dongargaon	62	252	83	379
171			Kurkheda	Gurnoli	262	1091	289	1170
172			Korchi	Pendakodo	Na	Na	Na	Na
173			Desaiganj (Vadasa)	Kasari Gaoganna	Na	Na	Na	Na
174			Kurkheda	Umarzari	Na	Na	Na	Na
175			Desaiganj (Vadasa)	Pimpalgaon	247	1212	251	1366
176			Kurkheda	Arattondi	110	618	153	903
177			Armori	Nawargaon	6	30	5	20
178			Armori	Mulur Chak	11	55	18	71
179			Armori	Shankarnagar	232	1091	273	1210
180			Kurkheda	Deulgaon	134	569	141	581



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
181			Dhanora	Marma	12	76	24	112
182			Dhanora	Dabba	5	20	7	20
183			Kurkheda	Khobramendha	106	467	143	624
184			Armori	Kasavi	197	874	224	937
185			Armori	Pathargota	305	1340	310	1415
186			Armori	Armori	3925	17784	4441	18504
187			Armori	Ashta	180	849	243	951
188			Armori	Jogisakhara	368	1624	401	1649
189			Dhanora	Ranwahi	4	30	5	34
190			Armori	Rampur Chak	169	711	168	729
191			Armori	Arsoda	559	2389	660	2621
192			Dhanora	Murzar	4	26	8	34
193			Dhanora	Charwahi	20	158	28	155
194			Dhanora	Gotatola	13	49	14	73
195			Dhanora	Gatanyeli	17	95	28	134
196			Dhanora	Ampayli	14	54	24	116
197			Dhanora	Mujalgondi	55	289	67	345
198			Dhanora	Khedegaon	67	370	70	343
199			Dhanora	Yerkadmowad	360	1571	358	1570
200			Dhanora	Darchi	50	259	63	270
201			Dhanora	Chavela	124	590	129	580
202			Dhanora	Gattepayli	65	352	68	385
203			Dhanora	Mendha	60	287	106	473
204			Dhanora	Irpundi	1	7	1	6
205			Dhanora	Girola	73	591	104	739
206			Dhanora	Todemasahat	20	118	32	154
207			Dhanora	Yengaon	20	118	30	140
208			Dhanora	Munganer	39	223	57	229
209			Dhanora	Bodiri	26	151	33	151
210			Dhanora	Horakasa	6	44	12	43

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
211			Dhanora	Godalwahi	200	1074	207	1181
212			Dhanora	Kuthegaon	74	408	90	445
213			Dhanora	Makepayli	8	71	16	70
214			Dhanora	Latzora	3	19	3	14
215			Dhanora	Rakhatola	48	276	62	293
216			Kurkheda	Jayatpur (Rith)	Na	Na	Na	Na
217			Korchi	Kohaka Masahat	Na	Na	Na	Na
218			Korchi	Banjari (Rith)	Na	Na	Na	Na
219			Korchi	Deogad (Rith)	Na	Na	Na	Na
220			Armori	Manjewada	Na	Na	Na	Na
221			Kurkheda	Yedaskuhi Masehat	Na	Na	45	195
222			Dhanora	Muranda	Na	Na	Na	Na
223			Dhanora	Hulondi	Na	Na	Na	Na
224			Dhanora	Begadi	Na	Na	Na	Na
225			Dhanora	Phustola	108	426	66	211
226			Dhanora	Yedampayli Kh	37	164	35	160
227			Dhanora	Bhapada	25	116	26	104
228			Dhanora	Jambhalizora	1	19	8	25
229			Gadchiroli	Nagweli	16	89	20	119
230			Gadchiroli	Korkuti	11	45	10	54
231			Chamorshi	Vikaspalli	213	1019	300	1212
232			Etapalli	Gumadi M	12	56	14	56
233			Etapalli	Paidi	27	159	33	217
234			Etapalli	Nawegaon	4	29	8	40
235			Mulchera	Garanji	33	189	50	228
236			Mulchera	Adangepalli	23	111	21	100
237			Aheri	Tondel	12	48	9	38
238			Mulchera	Hetalkasa	44	176	48	219
239			Mulchera	Gatta (Vangram)	15	80	22	107
240			Mulchera	Pulligudam	31	138	56	232



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
241			Mulchera	Bolepalli	143	732	188	1017
242			Mulchera	Morkhandi Rith	4	22	20	82
243			Etapalli	Chandanweli (s)	249	1144	327	1334
244			Mulchera	Harinagar	147	798	202	886
245			Mulchera	Mukali	24	114	38	162
246			Mulchera	Mukali Tola	65	330	93	442
247			Mulchera	Govindpur	138	750	164	786
248			Mulchera	Medhuranagar	99	544	155	698
249			Aheri	Watra Bk S	15	68	19	82
250			Aheri	Ambezara	24	89	21	104
251			Aheri	Yenkabanda	72	321	90	387
252			Aheri	Mirkal M	35	182	41	236
253			Aheri	Talwada	88	544	68	456
254			Aheri	Lowa S	47	193	45	236
255			Aheri	Birhadght	29	152	36	185
256			Aheri	Naingudam	37	146	46	195
257			Aheri	Pattigaon M	21	89	23	123
258			Aheri	Khandala	77	402	109	467
259			Aheri	Tatigudam	210	920	249	1047
260			Aheri	Rajaram	432	2042	485	2340
261			Aheri	Devalmari S	431	1708	477	2203
262			Aheri	Chhallelwada	549	2617	788	3148
263			Aheri	Asa M	32	126	29	155
264			Aheri	Watra Bk M	29	104	41	156
265			Aheri	Watra Kh S	104	399	128	494
266			Aheri	Kolamarka	14	37	Na	Na
267			Aheri	Avalmari	150	707	198	827
268			Aheri	Karancha S	38	177	52	226
269			Aheri	Joganguda	106	514	119	626
270			Aheri	Umanur M	20	98	26	123

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
271			Aheri	Metigudam	71	308	67	387
272			Aheri	Konjed	24	153	34	199
273			Aheri	Kalled	44	216	49	301
274			Desaiganj (vadasa)	Kondhala	858	3637	974	3873
275			Armori	Ravi	120	537	151	625
276			Armori	Waghala	131	569	406	1634
277			Aheri	Pattigaon S	Na	Na	Na	Na
278			Aheri	Gotelingampalli	Na	Na	Na	Na
279			Aheri	Watra Kh M	Na	Na	Na	Na
280			Aheri	Bondra M	Na	Na	Na	Na
281			Armori	Mulur	Na	Na	Na	Na
282			Sironcha	Water Body	Na	Na	Na	Na
283		Chandrapur	Brahmapuri	Saigaon Tukum	206	811	267	969
284			Brahmapuri	Nilaj	326	1459	352	1557
285			Brahmapuri	Belpatali	146	636	168	651
286			Brahmapuri	Panchagaon	101	452	106	454
287			Brahmapuri	Gangalwadi	489	1997	566	2047
288			Brahmapuri	Gogaon	362	1543	417	1605
289			Brahmapuri	Chichgaon	322	1395	372	1489
290			Brahmapuri	Kosambi Khadasmara	234	967	251	1034
291			Brahmapuri	Baradkinhi	651	2771	710	2930
292			Brahmapuri	Aksapur	143	598	167	648
293			Brahmapuri	Murpar	130	475	138	527
294			Brahmapuri	Powanpar	55	214	66	237
295			Brahmapuri	Wandra	378	1606	436	1626
296			Brahmapuri	Belgaon Kh	44	168	46	188
297			Brahmapuri	Ekara	238	1044	281	1096
298			Brahmapuri	Rudrapur Rith	Na	Na	Na	Na
299			Brahmapuri	Selada	13	53	17	61
300			Sindewahi	Powanpar	251	1039	66	237



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
301			Chandrapur	Chak Pimpal Khut	53	239	56	211
302			Sawali	Saimara Chak	12	34	12	44
303			Mul	Tekadi	464	2046	495	2091
304			Brahmapuri	Khatgaon	Na	Na	Na	Na
305			Sindewahi	Khairi Chak	78	349	103	407
306			Sindewahi	Gunjewahi M.N.2	29	105	51	166
307			Mul	Gangalwadi	186	816	202	837
308			Mul	Ushrada Chak	340	1644	431	1803
309			Chandrapur	Pimpal Khunt	96	397	89	344
310			Sindewahi	Gunjewahi M.N.1	551	2258	616	2247
311			Sindewahi	Mangli Chak	22	78	24	95
312			Sindewahi	Chikmara	200	750	197	768
313			Chandrapur	Nimbala	174	699	199	716
314			Sindewahi	Tambegadi Mendha	242	979	282	1077
315			Sawali	Saimara Tuk	137	590	141	575
316			Sawali	Mundala	282	1221	310	1276
317			Sawali	Mategaon	13	53	17	62
318			Mul	Shivapur Ryt.	46	190	68	229
319			Mul	Murmadi	124	468	127	534
320			Mul	Padzari	28	105	34	114
321			Mul	Chikhli	447	1986	519	2199
322			Mul	Padzari Chak	24	93	5	25
323			Mul	Chak Chikhli No.1	58	254	55	242
324			Mul	Chak Kanhalgaon	1	4	Na	Na
325			Mul	Belgata	144	599	147	633
326			Mul	Somnath (N.V.)	53	697	262	451
327			Mul	Maroda	951	4329	1039	4190
328			Mul	Morwahi Chak	57	269	67	301
329			Chandrapur	Doni	74	299	83	277
330			Mul	Chitegaon	288	1161	334	1241

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
331			Sawali	Sadagad	77	338	77	334
332			Chandrapur	Chak Nimbala	233	979	234	979
333			Sindewahi	Khari Golkar	Na	Na	Na	Na
334			Chandrapur	Waigaon Mokasa	126	552	160	611
335			Chandrapur	Nandgur	66	317	73	308
336			Chandrapur	Chak Borda	27	106	30	127
337			Pombhurna	Ghanoti Tukum	134	563	147	586
338			Chandrapur	Chak Waigaon No.2.	106	535	132	560
339			Chandrapur	Gondsawari Rayyatwari	203	985	243	1040
340			Chandrapur	Ajayapur Raiyyatwari	306	1268	304	1325
341			Chandrapur	Borda Indarpawar	317	1652	323	1602
342			Chandrapur	Chichpalli	361	1521	432	1572
343			Chandrapur	Ghanta Chauki	75	352	85	324
344			Chandrapur	Jamrala	87	383	108	435
345			Pombhurna	Satara Tukum	103	413	112	404
346			Mul	Chikhli No.2	Na	Na	Na	Na
347			Mul	Belgata Chak No.1	Na	Na	Na	Na
348			Mul	Belgata Chak No.2	Na	Na	Na	Na
349			Pombhurna	Umari Potdar	179	792	195	755
350			Pombhurna	Umari Tukum	178	1117	183	715
351			Chandrapur	Chak Waigaon No.1	Na	Na	Na	Na
352			Chandrapur	Walni Chack	Na	Na	Na	Na
353			Pombhurna	Chak Ghanoti No.1	160	721	205	776
354			Pombhurna	Satara Bhosale	71	314	80	320
355			Pombhurna	Satara Komti	109	427	121	443
356			Pombhurna	Chak Ambe Dhanora	177	695	210	735
357			Pombhurna	Chak Borgaon Rith	33	157	49	263
358			Pombhurna	Chak Ghanoti No.2	91	400	99	382
359			Gondpipri	Ganpur	135	522	133	495
360			Gondpipri	Kanhalgaon	197	777	181	668



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
361			Gondpipri	Pachgaon	50	195	63	224
362			Gondpipri	Tomta	78	315	20	82
363			Gondpipri	Sonapur Deshpande	288	1172	392	1366
364			Gondpipri	Wamanpalli	80	332	93	345
365			Brahmapuri	Kharkada	406	1813	476	1966
366	Chhattisgarh	Rajnandgaon	Chhuikhadan	Nachaniya	164	818	237	1063
367			Chhuikhadan	Kharra	20	71	32	159
368			Chhuikhadan	Murum	35	131	31	119
369			Chhuikhadan	Gerukhadan	128	506	151	605
370			Chhuikhadan	Daria Konha	8	39	9	46
371			Chhuikhadan	Makhurahi	Na	Na	Na	Na
372			Chhuikhadan	Chuhri	Na	Na	13	48
373			Chhuikhadan	Majgaon	44	207	53	249
374			Chhuikhadan	Nawagaon	63	306	82	390
375			Chhuikhadan	Tendnbhatha	68	359	82	392
376			Chhuikhadan	Sarodhi	82	386	127	500
377			Chhuikhadan	Kumhi	63	267	73	328
378			Chhuikhadan	Marka Tola	12	39	11	47
379			Chhuikhadan	Bhave	52	249	68	309
380			Chhuikhadan	Kohkadih	Na	Na	Na	Na
381			Chhuikhadan	Bardih	Na	Na	Na	Na
382			Chhuikhadan	Sohariya	Na	Na	Na	Na
383			Chhuikhadan	Kolambo	Na	Na	Na	Na
384			Chhuikhadan	Khamhardih	Na	Na	Na	Na
385			Chhuikhadan	Churii	Na	Na	Na	Na
386	Dongargarh			Khursipar Kalan	87	392	118	479
387	Dongargarh			Kurejhar	26	117	30	121
388	Dongargarh			Khampura	84	454	112	557
389	Dongargarh			Piparkhar Kalan	114	550	155	691
390	Dongargarh			Bhagwantola	76	394	90	466

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
391			Dongargarh	Bhursatola	68	289	81	336
392			Dongargarh	Banspahad	84	419	103	506
393			Dongargarh	Pithar	22	93	24	111
394			Dongargarh	Murarpani	Na	Na	Na	Na
395			Dongargarh	Damaudahra	62	270	67	314
396			Dongargarh	Pitepani	199	907	261	1149
397			Dongargarh	Bhalukonha	42	214	49	242
398			Rajnandgaon	Pendrideeh	109	532	146	717
399			Dongargarh	Tot Kasa	95	456	110	584
400			Dongargarh	Alidand	75	351	89	474
401			Dongargarh	Ghodtalab	84	363	95	422
402			Dongargarh	Gundri	Na	Na	3	12
403			Rajnandgaon	Ghodatalab	188	819	274	1102
404			Rajnandgaon	Telinbandha	181	907	241	1187
405			Rajnandgaon	Khobha	323	1487	421	1878
406			Rajnandgaon	Anko	107	488	130	553
407			Rajnandgaon	Job	199	898	249	1088
408			Rajnandgaon	Hetackasa	10	63	14	41
409			Rajnandgaon	Bijepar	94	460	127	655
410			Rajnandgaon	Jhadi Khairi	131	646	147	777
411			Rajnandgaon	Bendandi	103	445	116	578
412			Rajnandgaon	Khedepar	25	127	32	155
413			Manpur	Mardagota	10	47	18	105
414			Manpur	Tukam	18	110	24	123
415			Rajnandgaon	Ghorda	Na	Na	Na	Na
416		Kawardha	Kawardha	Barendipani	31	133	37	214
417			Kawardha	Bandukunda Alias Siliyari	20	112	34	175
418			Kawardha	Dariya	47	245	76	338
419			Kawardha	Sonwahi	65	341	131	569
420			Kawardha	Bodalpani	117	585	142	650



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
421			Kawardha	Plot Rol	15	58	16	65
422			Kawardha	Barela	7	37	14	56
423			Kawardha	Khamraha	15	59	30	123
424			Kawardha	Padari Pani	59	225	77	294
425			Kawardha	Minminiya	67	319	105	420
426			Kawardha	Kanhari	69	320	108	440
427			Kawardha	Ghathola	9	40	Na	Na
428			Kawardha	Kurma	37	148	43	182
429			Kawardha	Bigarbharri	19	128	37	138
430			Kawardha	Saral Patera	86	408	125	504
431			Kawardha	Songhari	91	449	101	553
432			Kawardha	Bakharipani	Na	Na	Na	Na
433	Madhya Pradesh	Balaghat	Lanji	Danditola	Na	Na	Na	Na
434			Lanji	Mukatola	Na	Na	Na	Na
435			Lanji	Tatikalani	30	146	52	233
436			Lanji	Katiparkalan	25	131	32	124
437			Lanji	Bapi(bareli)	Na	Na	Na	Na
438			Lanji	Bapi(bordi)	Na	Na	Na	Na
439			Lanji	Baigatola	Na	Na	Na	Na
440			Lanji	Sitapala	Na	Na	Na	Na
441			Lanji	Nawagarh	Na	Na	Na	Na
442			Lanji	Janwahi	Na	Na	Na	Na
443			Lanji	Baghnadi	Na	Na	Na	Na
444			Lanji	Lendehhari	Na	Na	Na	Na
445			Lanji	Ghoghra	Na	Na	Na	Na
446			Lanji	Dudamjhiriya	Na	Na	Na	Na
447			Lanji	Lanjitola	Na	Na	Na	Na
448			Lanji	Lodhiwada	Na	Na	Na	Na
449			Lanji		Na	Na	Na	Na
450			Baihar		29	157	42	193

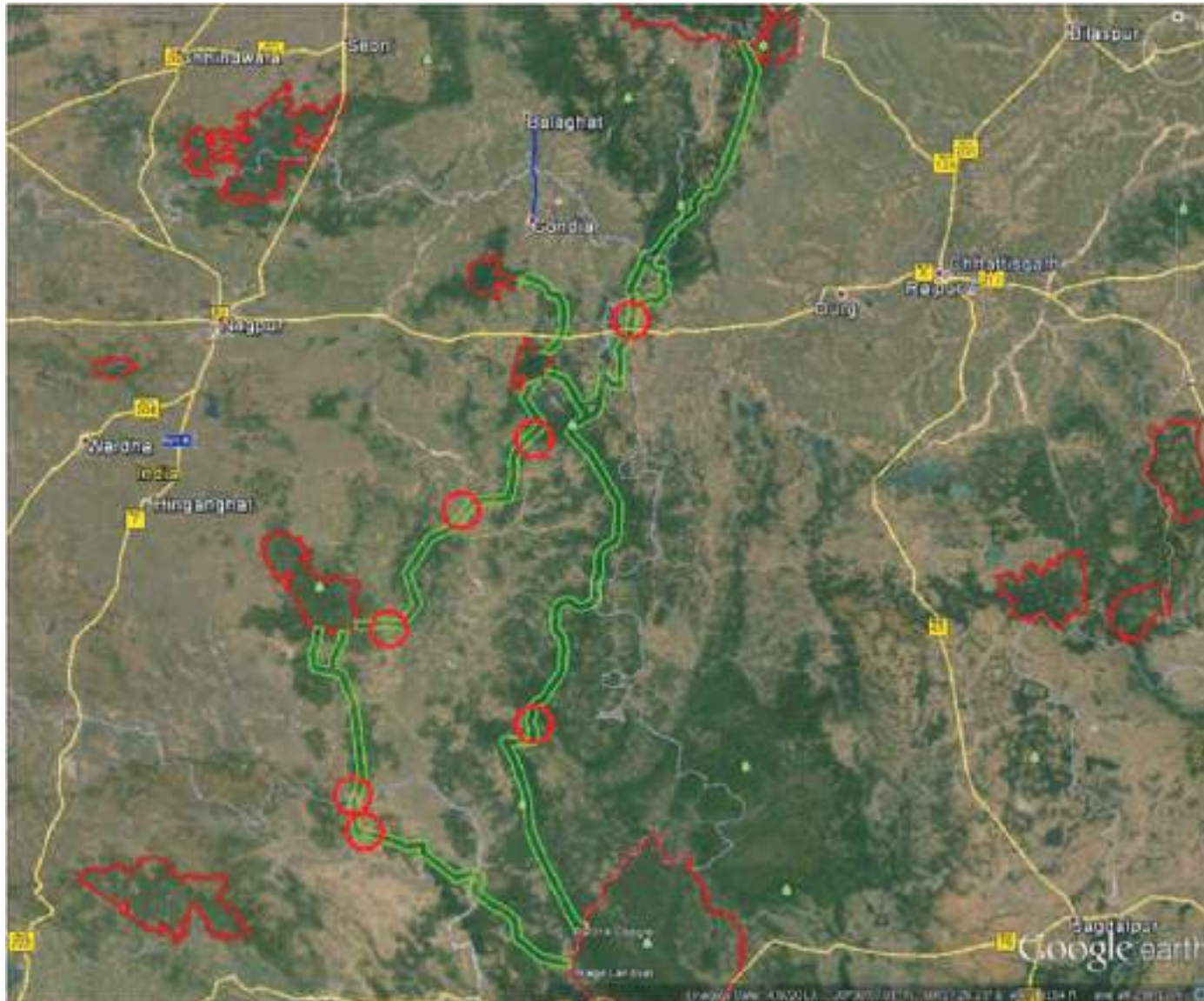


Figure 2.38:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kanha-Navegaon-Nagzira-Tadoba-Indravati

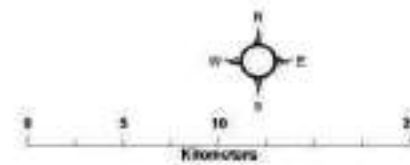
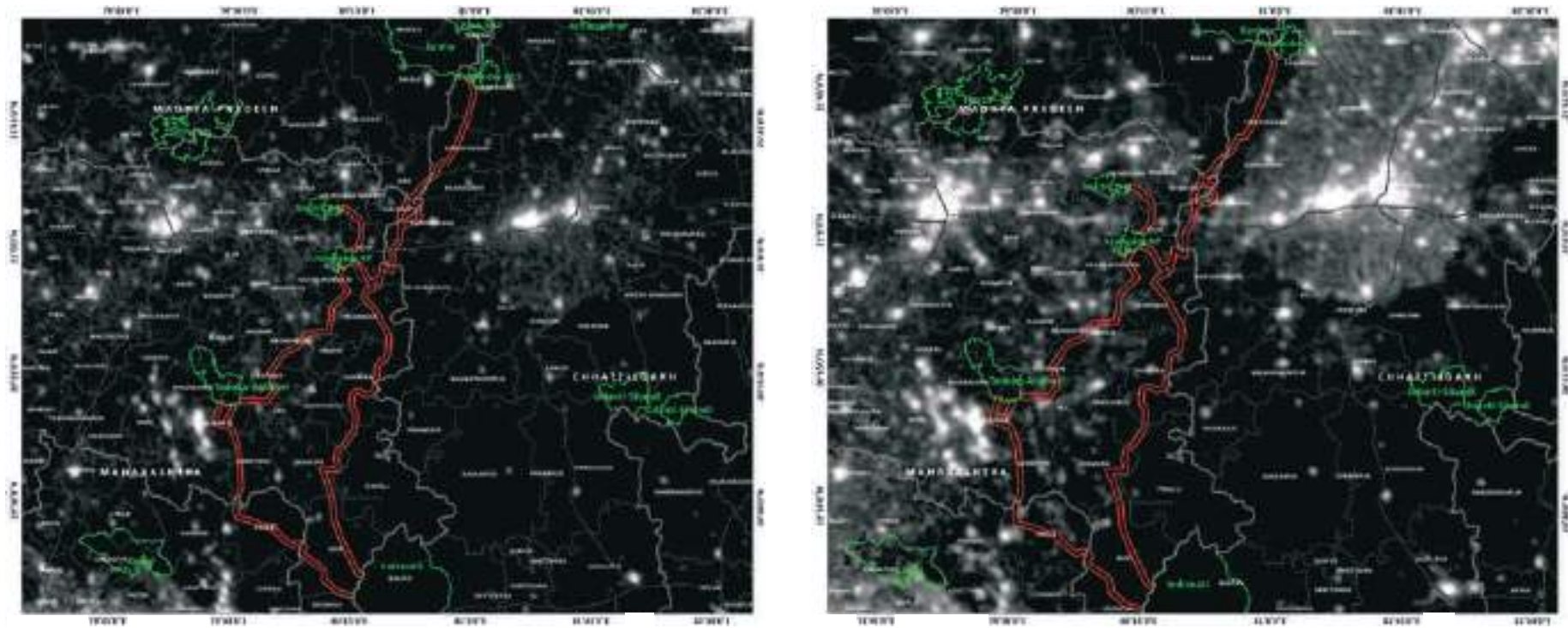


Figure 2.39:

Human habitation as depicted by nightlights within the Kanha-Navegaon-Nagzira-Tadoba-Indravati landscape in the year 1992 and 2012

INDRAVATI-UDANTI-SITANADI-SUNEBEDA

Currently the tiger population in this landscape is low with Indravati not being assessed due to insurgency. However due to the sheer size of the landscape the area has high potential for tiger conservation in the future. The landscape also holds the last pure gene pool of the Asiatic wild swamp buffalo. The area is ridden with poverty and therefore biotic pressure on the forest and the corridor are high. With government driven economic incentives and social upliftment these pressures are likely to reduce in the future giving a chance to wildlife for recuperation. Currently the national and state highways that pass through the corridor do not pose to be a barrier but care needs to be taken for control of development along these linear features, as is happening along national highway number 43. This area also has potential for mineral extraction and care need to be taken that appropriate mitigation measures are implemented when granting permissions to such projects so as not to compromise on the conservation objectives of this corridor.

Indravati - Pamed WLS

Currently the habitat connectivity between Indravati and Pamed WLS is good and should enable wildlife to move between these protected areas with ease. However, in the future infrastructural development in this region should consider the importance of incorporating wildlife friendly mitigation measures so that the corridor value of the habitat is not compromised.

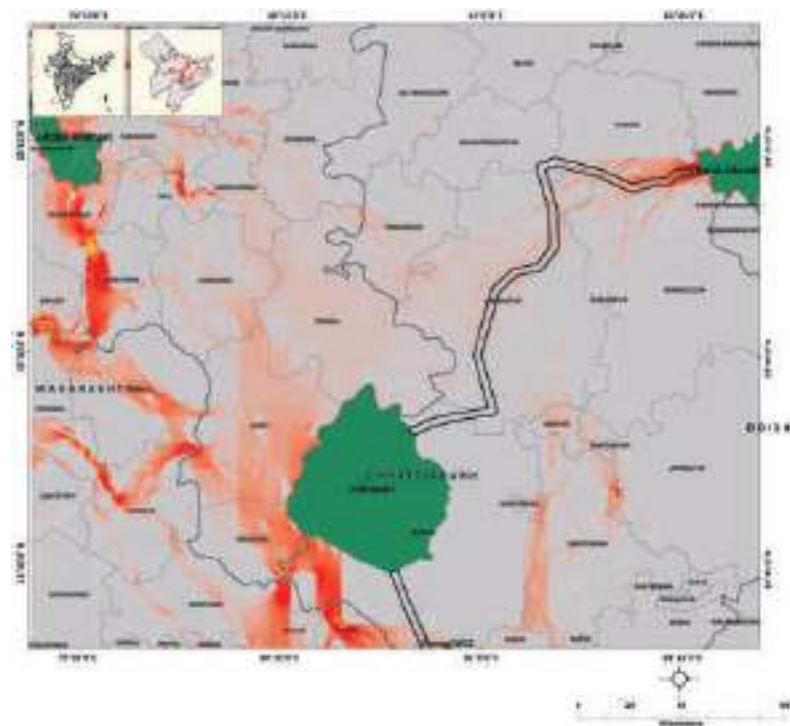
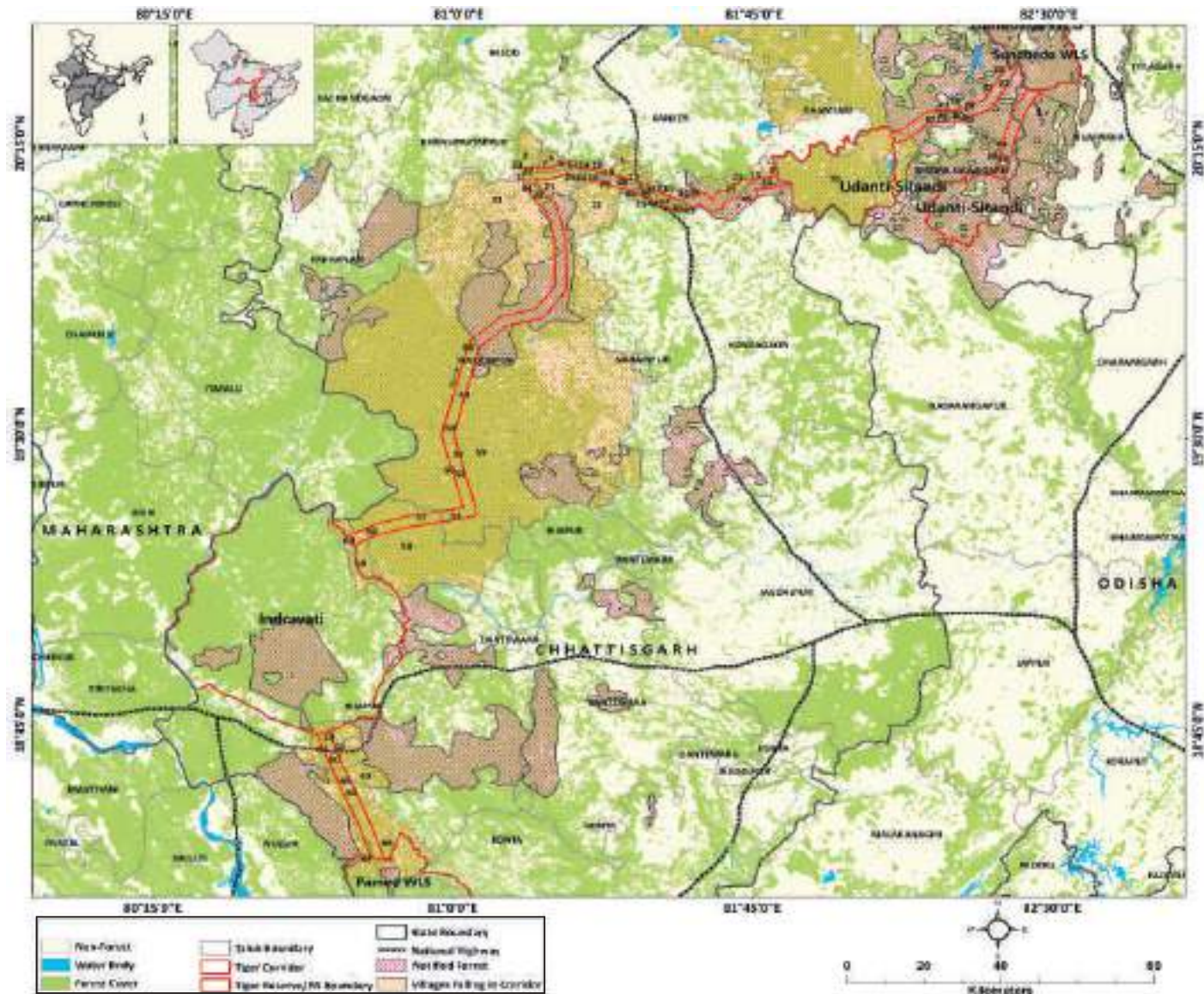


Figure 2.40:
Potential habitat connectivity for tiger movement between Indravati- Udanti-Sitanadi-Sunebeda Corridor as depicted by CIRCUITSCAPE

Indravati-Udanti-Sitanadi-Sunebeda	
Habitat size	41211 Km ²
Source Population	NA
Size of Source	NA
Protected Areas	Indravati Tiger Reserve Udanti-Sitanadi Tiger Reserve Sunebeda WLS Pamed WLS
Corridors	Indravati-Udanti-Sitanadi Udanti-Sitanadi-Sunebeda Indravati-Pamed WLS

Figure 2.41:

Least Cost Pathway corridor for Tiger movement between Indravati- Udanti- Sitanadi-Sunebeda overlaid with village map (the village numbers are referenced in Table 2.9)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Odisha	Nuapada	Boden	Patdarha	355	1605	405	1830
2	Chhattisgarh	Kanker	Bhanupratappur	Jalhur	5	21	5	18
3			Bhanupratappur	Kinari	101	522	128	546
4			Bhanupratappur	Kathali	68	372	84	412
5			Kanker	Chiwranj	86	380	90	402
6			Bhanupratappur	Baskuhud	125	600	149	743
7			Bhanupratappur	Niche Tonka	31	165	37	170
8			Narharpur	Basanwahi	565	2970	672	3260
9			Bhanupratappur	Banoli	69	302	83	348
10			Kanker	Pidhapal	229	1039	247	1202
11			Kanker	Kotgaon(uper)	5	28	13	67
12			Antahgarh		NA	NA	NA	NA
13			Bhanupratappur	Kuwapani	120	608	151	701
14			Kanker	Kumkakudum	6	36	6	46
15			Narharpur	Bangabari	228	1108	302	1240
16			Kanker	Tultuli	149	732	171	754
17			Kanker	Iradah	92	523	108	572
18			Kanker	Kanagaon	58	279	70	339
19			Narharpur	Sainunda	214	1056	238	1140
20			Bhanupratappur	Uper Tonka	37	186	51	268
21			Bhanupratappur	Dhaneli	144	813	168	931
22			Bhanupratappur	Bhurka	33	156	33	143
23			Narharpur	Tiriyarpani	39	160	57	217
24			Kanker	Murragaon	36	190	36	205
25			Kanker	Bhaishaon	63	308	89	449
26			Kanker	Mujalgondi	9	49	10	50
27			Narharpur	Nishanharra	56	313	82	401
28			Kanker	Malajkudum	51	269	57	315
29			Antahgarh	Marmakonadi	7	43	10	46

Table 2.9.

Villages within the Least Cost Pathway Corridor connecting Indravati-Udanti-Sitanadi-Sunebeda as shown in Fig. 2.41

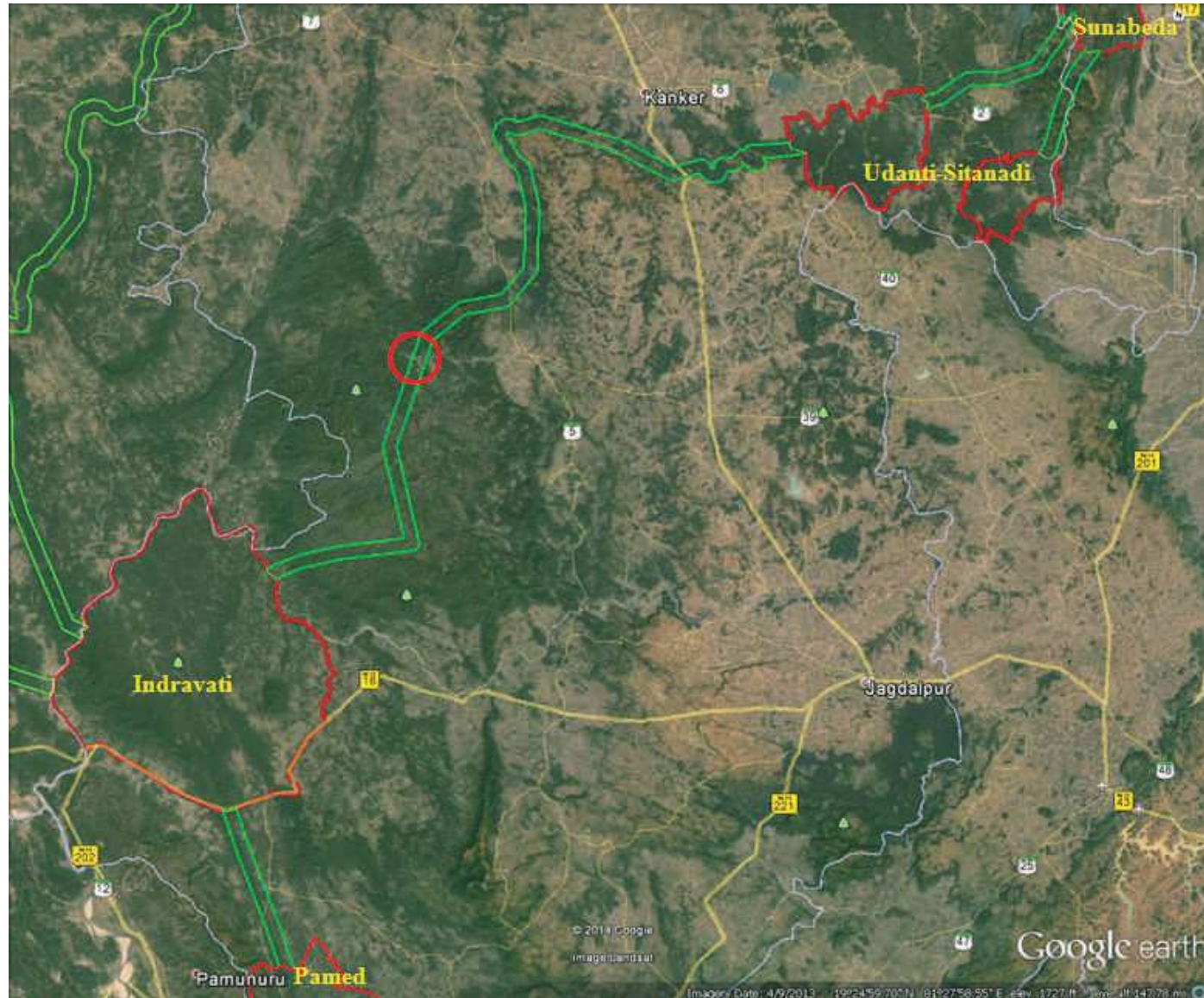
Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
30			Antahgarh	Gumjhir	70	368	81	434
31			Antahgarh	Bulawand	118	581	176	740
32			Antahgarh	Garda	21	129	30	146
33			Antahgarh		NA	NA	NA	NA
34		Bastar	Keshkal	Mahurbeda	21	125	33	156
35			Keshkal	Kupagondi	25	126	26	153
36			Keshkal	Khalemurvend	189	886	219	992
37			Keshkal	Kukdadah	49	246	65	301
38			Keshkal	Umaradah	23	124	23	135
39			Keshkal	Chiprel	184	899	212	1032
40			Keshkal	Matenga	57	342	69	363
41			Keshkal	Farasgaon(murnar)	68	315	74	360
42			Keshkal	Sendurmeta	19	101	25	131
43			Keshkal	Uparmurvend	70	334	83	411
44			Keshkal	Dadargadh	35	146	33	161
45			Keshkal	Baijanpuri	170	787	242	1060
46			Keshkal	GarhSiliyara	35	177	NA	NA
47			Keshkal	Surdongar	602	2813	NA	NA
48			Narayanpur	Kumnar	2	10	2	14
49			Narayanpur	Jubada	93	461	104	503
50			Narayanpur	Gummarka	22	124	49	221
51			Narayanpur	Farasbeda	22	121	27	133
52			Narayanpur	Kodnar	22	107	45	194
53			Narayanpur	Harbel	35	174	41	207
54			Narayanpur		NA	NA	NA	NA
55			Narayanpur		NA	NA	NA	NA
56		Dantewada	Bijapur	Murumwada	48	248	56	281
57			Bijapur	Jatlur	72	335	80	355
58			Bijapur	Padmeta	27	150	28	171

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
59			Bhopalpattanam	Sandrel	43	288	67	300
60			Bhopalpattanam	Bhandarpal	54	236	68	254
61			Bhopalpattanam	Pawrel	84	429	124	472
62			Bhopalpattanam	Dharavaram	45	230	52	263
63			Bhopalpattanam	Penkram	72	311	84	320
64			Bhopalpattanam	Ilmidi	330	1628	360	1797
65			Bhopalpattanam	Chintakonta	105	536	117	623
66			Bhopalpattanam	Bhusapur(bhusaguda)	46	227	64	272
67			Bhopalpattanam	Galgam	69	355	72	314
68			Bijapur		NA	NA	NA	NA
69			Bijapur	Telaunugur	7	30	5	24
70		Dhamtari	Kurud	MulgaonF.v.	54	279	108	409
71		Raipur	Bindranawagarh	Besrajhar	41	184	41	161
72			Bindranawagarh	Nagarar	23	129	40	164
73			Bindranawagarh	Dhawalpurdih	458	2016	673	2456
74			Bindranawagarh	Jarandih	43	214	65	238
75			Bindranawagarh	Mohanda	274	1277	374	1477
76			Bindranawagarh	Toribhui	5	18	5	20
77			Bindranawagarh	Amamora	65	343	105	406
78			Bindranawagarh	Jangaldhawaipur	128	560	160	588
79			Bindranawagarh	Bodapala	10	55	15	62
80			Bindranawagarh	Dabnai	48	264	66	299
81			Bindranawagarh	Farsara	30	112	28	104
82			Bindranawagarh	Tupenga	9	28	12	43
83			Bindranawagarh	Chhindola	52	275	78	297
84			Bindranawagarh	Matarmal	NA	NA	NA	NA
85			Bindranawagarh	Nartora	NA	NA	NA	NA
86			Bindranawagarh	Kodomal	NA	NA	NA	NA
87		Raipur	Bindranawagarh	Satmar	NA	NA	NA	NA



Figure 2.42:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Indravati-Udanti-Sitanadi-Sunabeda



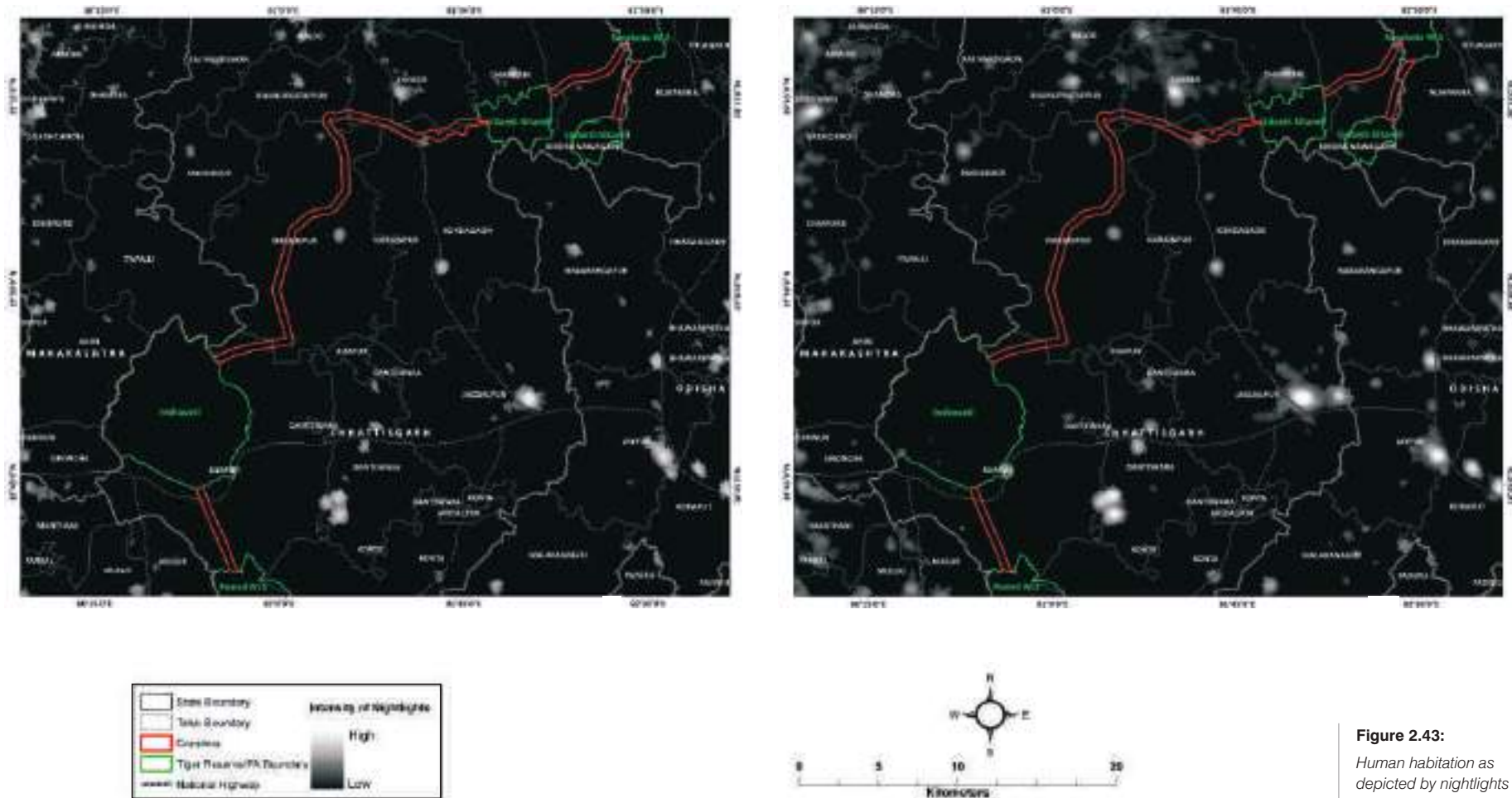


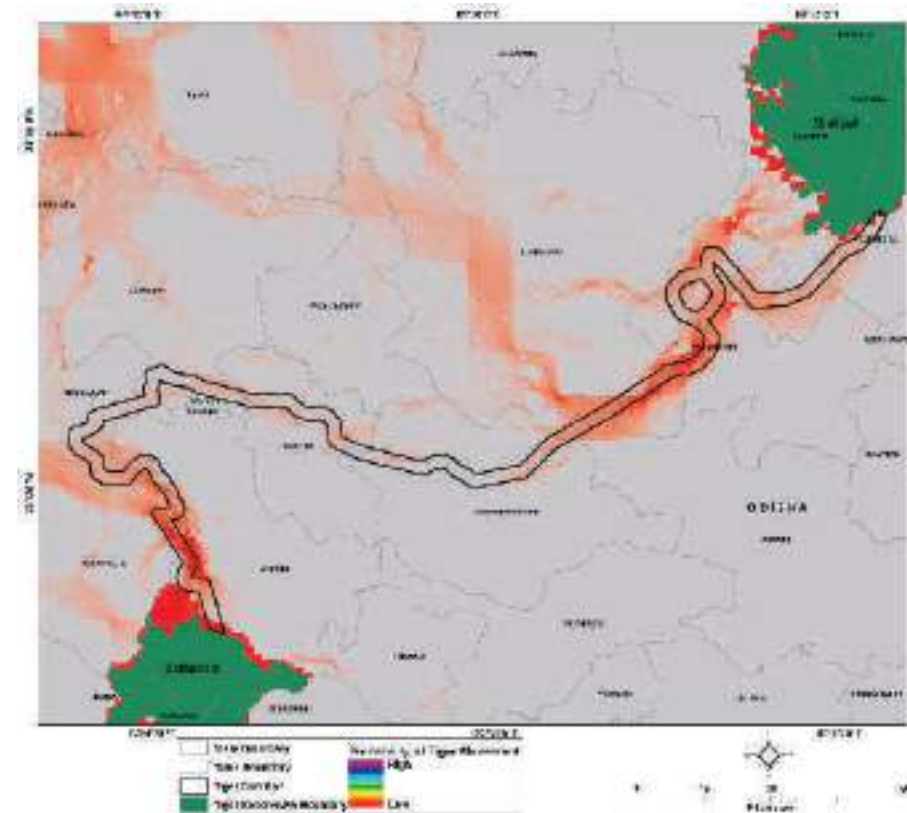
Figure 2.43:
Human habitation as depicted by nightlights within the Indravati-Udanti-Sitanadi-Sunebeda landscape in the year 1992 and 2012

SIMLIPAL-SATKOSIA

Figure 2.44:

Potential habitat connectivity for tiger movement between Simlipal-Satkosia Corridor as depicted by CIRCUITSCAPE model

Currently tiger densities in both Simlipal and Satkosia are depressed and there is lack of a source population to ensure tiger occupancy within the larger landscape. Considering that with appropriate protection and managerial inputs tiger populations in both these reserves will revive, then their long term survival would depend on gene flow between these populations. Besides Satkosia and Simlipal habitat connectivity with Hadagad WLS and Kapilas WLS need to be recognized and protected. The corridor between Satkosia and Simlipal is tenuous, long and consists of fragmented forests patches interspersed with agriculture, mines and varied human uses like thermal power plant. Major restorative inputs are required in this landscape to keep this corridor functional.



Simlipal-Satkosia

Habitat size	34057 Km ²
Source Population	Simlipal
Size of Source	12-34
Protected Areas	Simlipal Satkosia
Corridors	Simlipal-Satkosia

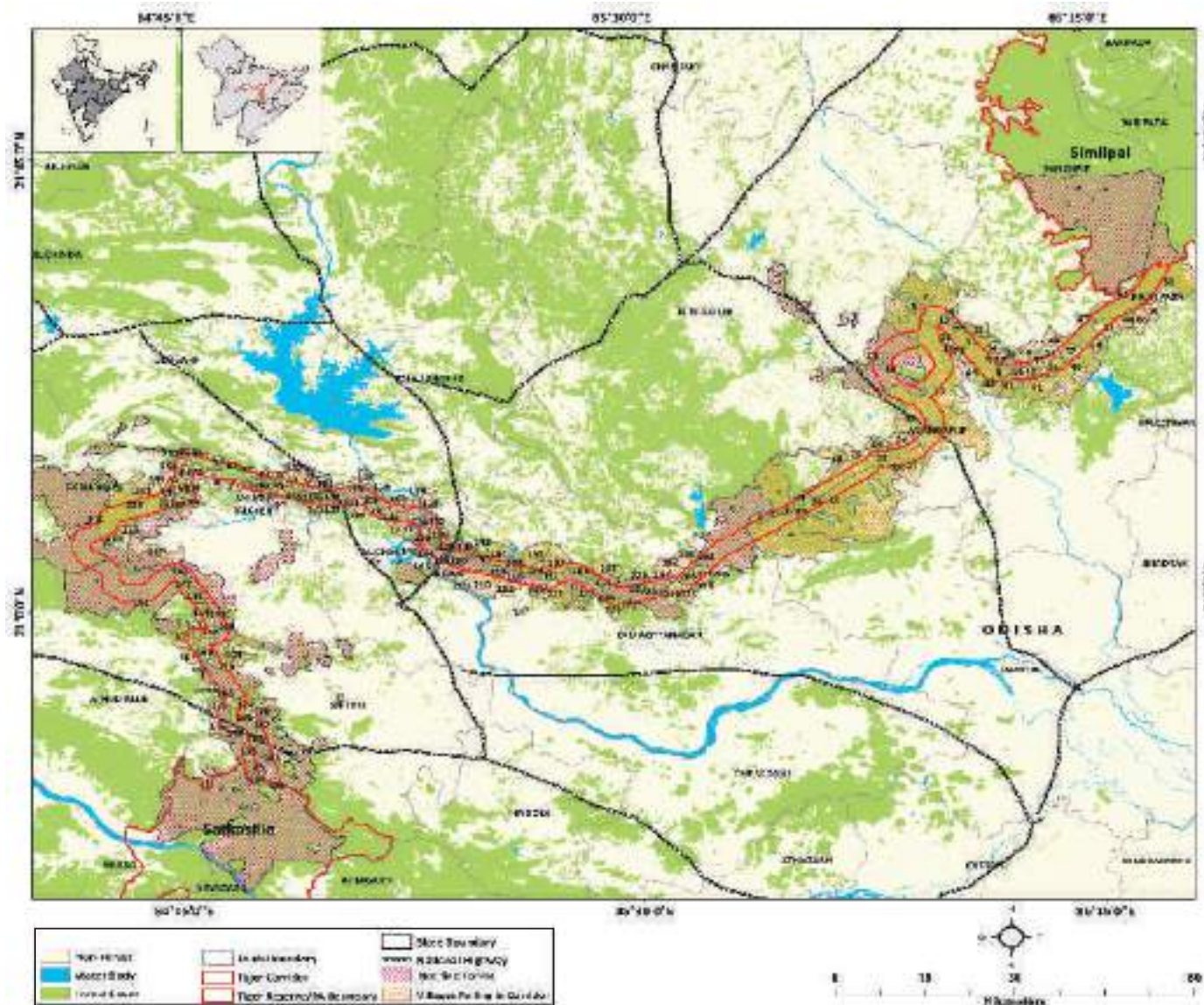


Figure 2.45:
Least Cost Pathway corridor for Tiger movement between Simlipal-Satkosia overlaid with village map (the village numbers are referenced in Table 2.10)

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Odisha	Jajapur	Sukinda	Nagada	56	247	55	307
2			Sukinda	Guhiasal	45	241	32	155
3			Sukinda	Rahangi	NA	NA	NA	NA
4			Sukinda		NA	NA	NA	NA
5		Kendujhar	Anandapur(P)	Kontala	41	230	66	271
6			Anandapur(P)	Gendaliabasa	29	147	29	140
7			Ghatgaon	Baiganpal	264	1204	368	1492
8			Ghatgaon	Banmahuldiha	179	864	217	986
9			Anandapur(P)	Palabani	26	154	42	201
10			Ghatgaon	Balijodi	170	971	224	1133
11			Ghasipura	Salukdahi	64	341	74	310
12			Ghasipura	Dargudisila	78	329	89	373
13			Ghatgaon	Upardiha	473	2443	740	3238
14			Anandapur(P)	Badudighara	70	395	86	455
15			Anandapur(P)	Hatochapal	17	63	39	153
16			Daitari	Badajumei	21	83	26	127
17			Anandapur(P)	Baigundi	62	359	79	404
18			Anandapur(P)	Panasijharan	158	766	209	893
19			Anandapur(P)	Baniajodi	188	973	249	1214
20			Anandapur(P)	Bhalughara	132	642	152	610
21			Anandapur(P)	Singanali	37	177	49	264
22			Anandapur(P)	Kantala	47	255	48	222
23			Anandapur(P)	Haribeda	23	131	31	160
24			Anandapur(P)	Santospur	121	610	136	621
25			Harichandanpur	Billa	313	1767	478	2367
26			Harichandanpur	Sagadapata	499	2403	595	2708
27			Harichandanpur	Barigaon	211	1127	273	1241
28			Harichandanpur	Hayarapur	69	397	110	540
29			Harichandanpur	Gounighasa	217	1104	369	1424
30			Daitari	Suakati	80	454	114	594

Table 2.10:
Villages within the Least Cost Pathway Corridor connecting Simlipal-Satkosia as shown in Fig. 2.45

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Harichandanpur	Palabani	51	236	42	201
32			Harichandanpur	Gaduana	113	539	144	691
33			Anandapur(P)	Mandapada	20	119	31	148
34			Daitari	Revana(kha)	50	257	63	271
35			Daitari	Talapada	112	553	205	969
36			Daitari	Sandhiaposi	NA	NA	NA	NA
37			Anandapur(P)	Gendabasa	NA	NA	NA	NA
38		Mayurbhanj	Udala	Hillblock No.24	261	1388	352	1593
39			Sharata	Gourchandrapur	453	2354	549	2817
40			Sharata	Sarat	626	3349	786	3899
41			Mahuldiha	Sat Kosia Forest Cluster	64	323	87	373
42			Mahuldiha	Duara Suni	84	531	125	602
43			Mahuldiha	Patar Pada	49	413	59	606
44			Sharata	Skadabahali	240	1296	302	1557
45			Mahuldiha	Pana Posi	123	550	134	603
46			Mahuldiha	Asur Khal	91	507	112	616
47			Sharata	Noto	323	1658	373	1705
48			Mahuldiha	Goudia Bahali	180	916	209	975
49			Mahuldiha	Ghulu Ghulia	291	1525	398	2120
50			Mahuldiha	Jhar Jhari	24	136	36	205
51			Mahuldiha	Baula	42	208	58	299
52			Mahuldiha	Bhalia Dal	162	877	209	1154
53			Mahuldiha	Jamu Nanda	242	1107	290	1405
54			Mahuldiha	Bag Dafa	198	1043	252	1152
55			Mahuldiha	Sat Kosia	195	1189	326	1658
56			Mahuldiha	Satkosia Amalnamahill Block	41	225	50	240
57		Debagarh	Kundheigola	Budhapal	251	1333	314	1307
58			Kundheigola	Garia Pali	32	153	42	205
59			Reamal	Poipani	15	70	19	79
60			Kundheigola	Rairatan Pur	45	221	61	266



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
61			Kundheigola	Mamurikhola	14	57	29	114
62			Kundheigola	Khanda Dhua	97	393	94	366
63			Kundheigola	Pancha Mahala	53	276	58	279
64			Kundheigola	Kendupal	30	155	38	189
65			Kundheigola	Baidya Sadhu Bahal	22	106	38	153
66			Kundheigola	Haldia Khol(k)	NA	NA	NA	NA
67			Kundheigola	Talranijharan	NA	NA	NA	NA
68			Kundheigola	Baisanalia	NA	NA	1	1
69			Kundheigola	Katasara	NA	NA	NA	NA
70			Kundheigola	Tamkia Khol	1	2	NA	NA
71			Kundheigola	Srungipal	60	313	66	340
72			Kundheigola	Deo Jharan	30	145	37	156
73			Kundheigola	Duduka Jharan	28	156	36	161
74			Kundheigola	Kadam Jhari	NA	NA	NA	NA
75			Kundheigola	Arkha Pal	24	125	34	144
76			Kundheigola	Tungamal	155	814	183	893
77			Kundheigola	Kapagola	57	242	61	275
78			Kundheigola	Kamar Pal	83	430	89	378
79			Kundheigola	Gurujanga	87	423	113	481
80			Kundheigola	Kundheigola	336	1722	420	1808
81			Kundheigola	Dalak	55	274	80	329
82			Kundheigola	Chhalak	60	321	100	520
83			Kundheigola	Jharadihi(k)	44	195	52	233
84			Kundheigola	Kanjamba	90	432	106	516
85			Kundheigola	Hrudapali	13	72	14	71
86			Kundheigola	Thianal	49	259	61	288
87			Kundheigola	Tutabari	41	225	62	307
88			Kundheigola	Tal Bahal	34	205	50	215
89			Kundheigola	Chadei Mara	79	435	115	533
90			Kundheigola	Tipei Jharan	1	1	NA	NA

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
91			Kundheigola	Jambu Munda	48	225	84	346
92			Kundheigola	Kankada Jharan	21	138	39	183
93			Kundheigola	Amba Chua	12	51	16	73
94			Kundheigola	Para	242	1193	334	1285
95			Kundheigola	Sunanali	NA	NA	3	11
96			Kundheigola	Bhalupal	NA	NA	NA	NA
97			Kundheigola	Uparrani Jharan	NA	NA	NA	NA
98			Kundheigola	Kudbila	NA	NA	NA	NA
99			Kundheigola	Mamuritap	NA	NA	5	20
100			Kundheigola	Kanjimba Matha	NA	NA	NA	NA
101			Kundheigola	Dhaura Khaman	NA	NA	11	44
102		Anugul	Kaniha	Gualiar	26	111	37	195
103			Rengali Damsite	Bajrakot	624	3134	788	3341
104			Kaniha	Palasapasi	19	85	NA	NA
105			Kaniha	Nialu	99	469	137	520
106			Chhendipada	Hariharpur	47	244	59	253
107			Kaniha	Birabhuin	16	90	27	98
108			Kaniha	Baudabeda	62	327	92	357
109			Samal Barrage	Gaunighasa	206	1067	305	1125
110			Kaniha	Lodhajhari	110	514	146	636
111			Kaniha	Titirima	249	1084	325	1226
112			Kaniha	Kendukhaman	45	234	67	281
113			Kaniha	Andhari	21	89	27	95
114			Kaniha	Jhadabandha	1	4	NA	NA
115			Kaniha	Brahmandei	107	520	134	613
116			Kaniha	Sunduri	95	532	128	520
117			Kaniha	Sapakata	101	451	134	555
118			Samal Barrage	Seepur	852	3797	661	2627
119			Samal Barrage	Karnapal	317	1473	300	1082
120			Kaniha	Nalam	374	1821	511	1902



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
121			Kaniha	Atabira	15	65	16	82
122			Chhendipada	Mandua	86	423	118	456
123			Kaniha	Bhajipur	15	78	23	127
124			Samal Barrage	Kusumpal	117	596	155	609
125			Chhendipada	Puriabeda	31	127	38	132
126			Kaniha	Dalaka	54	264	77	330
127			Chhendipada	Haribereni	53	249	67	314
128			Kaniha	Kanumanpur	130	743	179	804
129			Kaniha	Poipal	155	716	185	777
130			Samal Barrage	Siling	137	692	190	756
131			Kaniha	Durgapur	312	1576	387	1468
132			Samal Barrage	Parabil	410	1928	441	1858
133			Kaniha	Kiajhar	69	301	84	359
134			Kaniha	Talapada	235	1193	332	1402
135			Samal Barrage	Gaham	636	2777	576	2504
136			Samal Barrage	Biru	335	1597	452	1858
137			Chhendipada	Kanalo	410	1953	517	2219
138			Samal Barrage	Bulajhar	91	431	131	477
139			Samal Barrage	Dadari	1	2	3	11
140			Samal Barrage	Kashia	3	17	15	56
141			Samal Barrage	Dholagandia	27	114	34	123
142			Samal Barrage	Kulei	301	1369	362	1486
143			Samal Barrage	Balijharan	32	203	55	227
144			Samal Barrage	Danarabeda	104	517	116	507
145			Samal Barrage	Tumugola	357	1733	253	1131
146			Handapa	Laxminpriyapur	40	162	58	228
147			Handapa	Rajanpal	34	157	48	177
148			Handapa	Golasar	57	299	107	433
149			Handapa	Baliamba	26	126	44	172
150			Samal Barrage	Jharan	NA	NA	NA	NA

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
151			Kaniha	Arakhadihi(arakhadahi)	NA	NA	20	111
152			Handapa	Kholaregada	34	169	43	213
153			Handapa	Nuaashrubahal	26	103	26	115
154			Handapa	Madhupur	84	404	118	475
155			Kaniha	Fulajhari	NA	NA	26	111
156			Kaniha	Talabahal	NA	NA	NA	NA
157			Samal Barrage	Patramunda	NA	NA	NA	NA
158			Kaniha	Tolakapal	NA	NA	NA	NA
159			Handapa	Parbatipur	37	194	54	264
160			Chhendipada	Sudagola Sara	5	13	7	13
161			Handapa	Ichhapur	290	1243	354	1316
162			Handapa	Ashrubahal	106	480	139	596
163			Handapa	Nagajharan	100	479	115	487
164			Handapa	Khandabara	88	394	104	482
165			Handapa	Badibahal	60	291	73	342
166			Handapa	Jamunali	127	620	174	737
167			Handapa	Kadalimunda	321	1333	362	1593
168			Thakurgarh	Batrakhol	32	195	48	227
169			Jarapada (P)	Badamula	72	346	89	371
170			Jarapada (P)	Katada	361	1715	492	1967
171			Jarapada (P)	Kandhakorada	41	176	59	251
172			Purunakot	Rodasinga	153	752	188	885
173			Thakurgarh	Ghanamundia	NA	NA	NA	NA
174			Jarapada (P)	Para Forest Beat	NA	NA	NA	NA
175			Purunakot	Sitakoili(siti Koli)	35	209	40	206
176			Purunakot	Antulia	234	1223	295	1295
177			Purunakot	Betar	20	129	34	133
178			Jarapada (P)	Ogi(ugi)	482	2469	596	2445
179			Purunakot	Tabada	72	361	108	447
180			Purunakot	Kandhakuile	79	378	93	435



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
181			Purunakot	Manikajori	173	815	207	957
182			Purunakot	Khalamba	14	70	18	91
183			Purunakot	Bruti	73	366	103	491
184			Purunakot	Jaganathpur	245	1171	277	1196
185			Purunakot	Hinsrida	55	269	64	260
186			Jarapada (P)	Parajungle	23	139	55	218
187		Dhenkanal	Kamakshyanagar (P)	Dangapal	236	1255	302	1574
188			Parajang (P)	Tampej	97	476	108	493
189			Parajang (P)	Tipejharan	84	354	114	424
190			Parajang (P)	Rangathali	408	1855	484	2157
191			Parajang (P)	Madarnga Munda	44	192	62	272
192			Kamakshyanagar (P)	Dansanali	38	204	50	259
193			Parajang (P)	Padapatia	65	327	86	361
194			Parajang (P)	Bhejia	129	601	170	731
195			Parajang (P)	Chandapur	477	2272	566	2256
196			Parajang (P)	Sundarmundi	38	182	53	297
197			Parajang (P)	Mahabirod	714	3320	854	3612
198			Kamakshyanagar (P)	Sasapasi	302	1386	341	1578
199			Parajang (P)	Jaka	216	1117	330	1242
200			Parajang (P)	Patuapali	38	185	51	216
201			Parajang (P)	Sarakishor Pal	265	1240	280	1195
202			Kamakshyanagar (P)	Tarinipasi	84	440	95	564
203			Parajang (P)	Patharagarh	131	703	198	874
204			Kamakshyanagar (P)	Kandhara	472	2382	599	2476
205			Parajang (P)	Manikamara	281	1598	416	1858
206			Kamakshyanagar (P)	Koi(ka)	68	392	87	416
207			Kamakshyanagar (P)	Urbengi	132	660	166	806
208			Kamakshyanagar (P)	Palasadangi	144	738	193	936
209			Parajang (P)	Kadapada	197	975	275	1234
210			Parajang (P)	Basulei	923	4330	1121	4682

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
211			Kamakshyanagar (P)	Balikuma	105	596	151	792
212			Parajang (P)	Gola Gadia	124	529	169	620
213			Parajang (P)	Akhupal	40	129	20	95
214			Parajang (P)	Pakatomunda	83	432	123	496
215			Parajang (P)	Kuturia	246	1172	312	1444
216			Parajang (P)	Mahanapasi	108	470	136	626
217			Parajang (P)	Bagha Munda	117	514	150	799
218			Kamakshyanagar (P)	Sahala	96	664	118	635
219			Kamakshyanagar (P)	Jhanjiri Berena No-2	55	278	73	326
220			Kamakshyanagar (P)	Phulajhari	20	105	26	102
221			Kamakshyanagar (P)	Batagan	338	1852	434	2261
222			Kamakshyanagar (P)	Suaginali	42	287	63	329
223			Kamakshyanagar (P)	Sunia	20	122	28	129
224			Kamakshyanagar (P)	Rangamatia	21	110	23	110
225			Kamakshyanagar (P)	Kadabasanta	25	138	26	156
226			Kamakshyanagar (P)	Belabasanta	59	273	80	418
227			Parajang (P)	Bautinali	NA	NA	NA	NA
228			Parajang (P)	Jamunali	NA	NA	174	737
229			Parajang (P)	Rajjhara	NA	NA	1	1
230		Sambalpur	Naktideul	Bagbar	68	364	88	356
231			Naktideul	Sadhubahal	56	311	82	341
232			Naktideul	Kundeijori	4	21	8	25
233			Naktideul	Chadchadi	19	110	30	123
234			Naktideul	Bindpur	131	633	156	672
235			Naktideul	Angabira	100	561	137	665
236			Naktideul	Kaing	20	94	25	127
237			Naktideul	Sankhpur	31	158	58	198
238			Naktideul	Luburi	63	340	75	356
239			Naktideul	Hill	NA	NA	NA	NA



Figure 2.46:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Simlipal-Satkosia



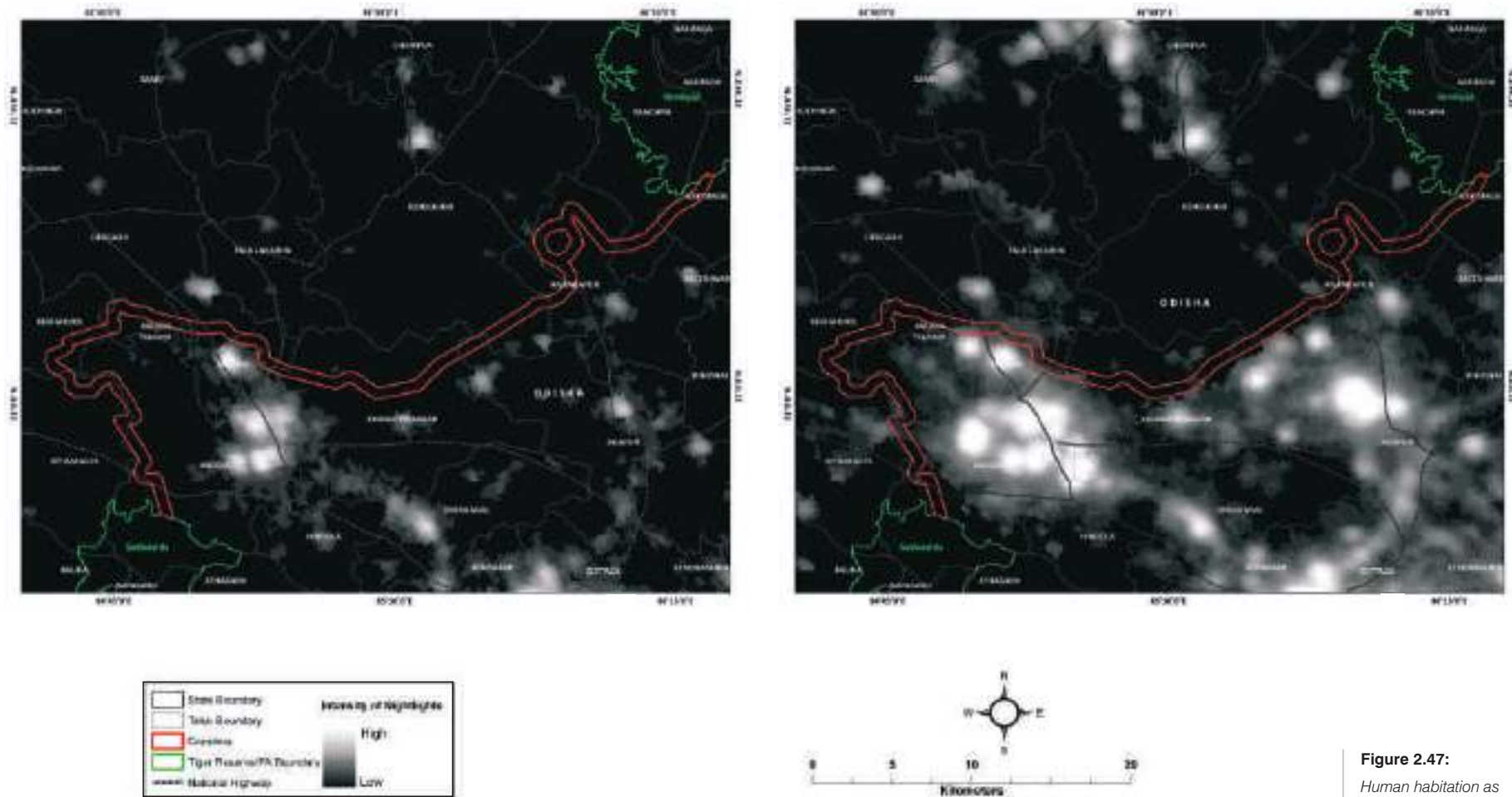


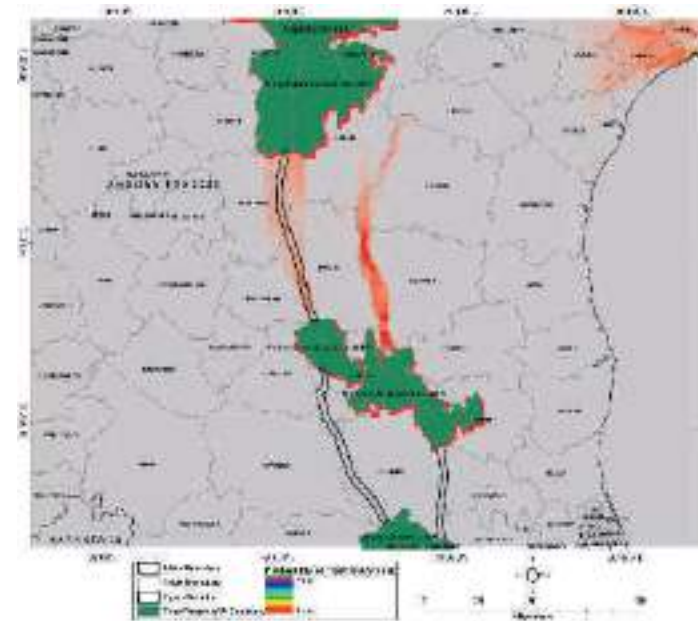
Figure 2.47:
Human habitation as depicted by nightlights within the Simlipal-Satkosa Corridor landscape in the year 1992 and 2012

NAGARJUNSAGAR -SRI VENKATESWARA NP

Figure 2.48:

Potential habitat connectivity for tiger movement between Nagarjunsagar -Sri Venkestwara NP Corridor as depicted by CIRCUITSCAPE model

The habitat corridor between Nagarjun Sagar Sri Sailam Tiger Reserve and Sri Venkestwara NP is mostly through forested habitat and passes through three protected areas Gundla Brahmeswaram WLS, Sri Lankamalleshwaram WLS and Sri Penusila Narasimha WLS. However, there are several national and state highways cutting across the corridor. These need to be appropriately mitigated by under and over Wildlife Passes so that they do not become barriers to wildlife movement. The major bottleneck is a patch of revenue land and township of Sidhavatam which constitutes about 2 km of the corridor stretch which would benefit from restorative inputs and ensuring that development in the stretch does not become a barrier to wildlife movement. The tiger density in NSTR especially in Gundla Brahmeswaram WLS is recovering, once this population increases dispersing tigers are likely to recolonize Sri Venkateswara NP from where they have become locally extinct. To enhance this process reintroduction / supplementation of tigers to Sri Venkestwara NP may also be considered.



Nagarjunsagar -Sri Venkateswara NP

Habitat size	13628 Km ²
Source Population	NSTR
Size of Source	53-66
Protected Areas	NSTR Gundla Brahmeswaram WLS Sri Lankamalleshwaram Sri Penusila Narasimha WLS Sri Venkateswara NP
Corridors	NSTR-Sri Lankamalleshwaram Sri Lankamalleshwaram- Sri Venkateswara NP Sri Penusila Narasimha - Sri Venkateswara

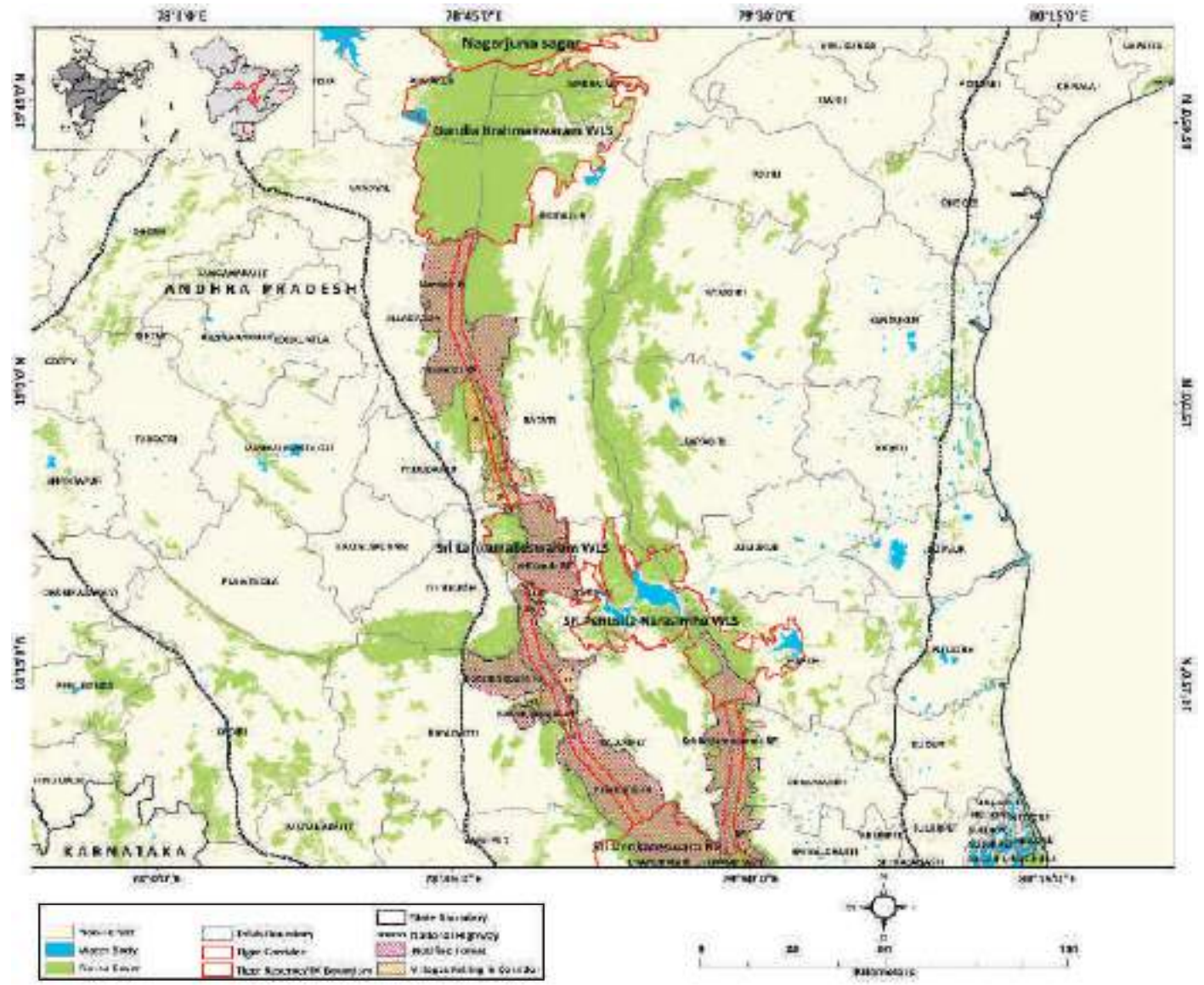


Figure 2.49: Least Cost Pathway corridor for Tiger movement between Nagarjunsagar -Sri Venkateswara NP overlaid by village map (the village numbers are referenced in Table 2.11)

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
2	Andhra Pradesh	Nellore	Venkatgiri	Vembuluru	807	3525	1043	3893
9		Chittoor	Rajampet	Balupalle	71	1041	77	279
10			Chandragiri	Karakambadi (Rural)	1698	7173	2684	10504
14		Cuddapah	Badvel	Jangamrajupalle	644	2909	317	1262
19			Proddatur	Machupalle	NA	NA	NA	NA
22			Rajampet	Pulapathuru	608	2575	544	2018
24			Sidhout	Vontithatipalle	261	1146	354	1356
25			Sidhout	Mulapalle	92	396	119	463
27			Rajampet	Rollamadugu	219	1092	174	680
28			Rajampet	Rollamadugu	219	1092	174	680
31			Proddatur/Badvel	Thippireddipalle	282	1195	330	1296
32			Proddatur/Badvel	Mudireddipalle	288	1277	328	1260
33			Proddatur/Badvel	Mittamanipalle	788	3681	1079	4253
34			Proddatur/Badvel	Nandyalampeta	2136	9673	2856	11457
35			Proddatur/Badvel	No Data	NA	NA	NA	NA
36			Sidhout	Jyothi	312	1418	388	1449
37			Sidhout	Machupalle	554	2438	610	2426
38			Sidhout	Gundlamoola	87	397	106	430
39			Sidhout	Kanumalapalle	36	181	62	499
42			Rayachoti	Gadikota	700	2759	811	3093

Table 2.11.
Villages within the Least cost Pathway Corridor between Nagarjunsagar -Sri Venkateswara NP as shown in Fig. 2.49

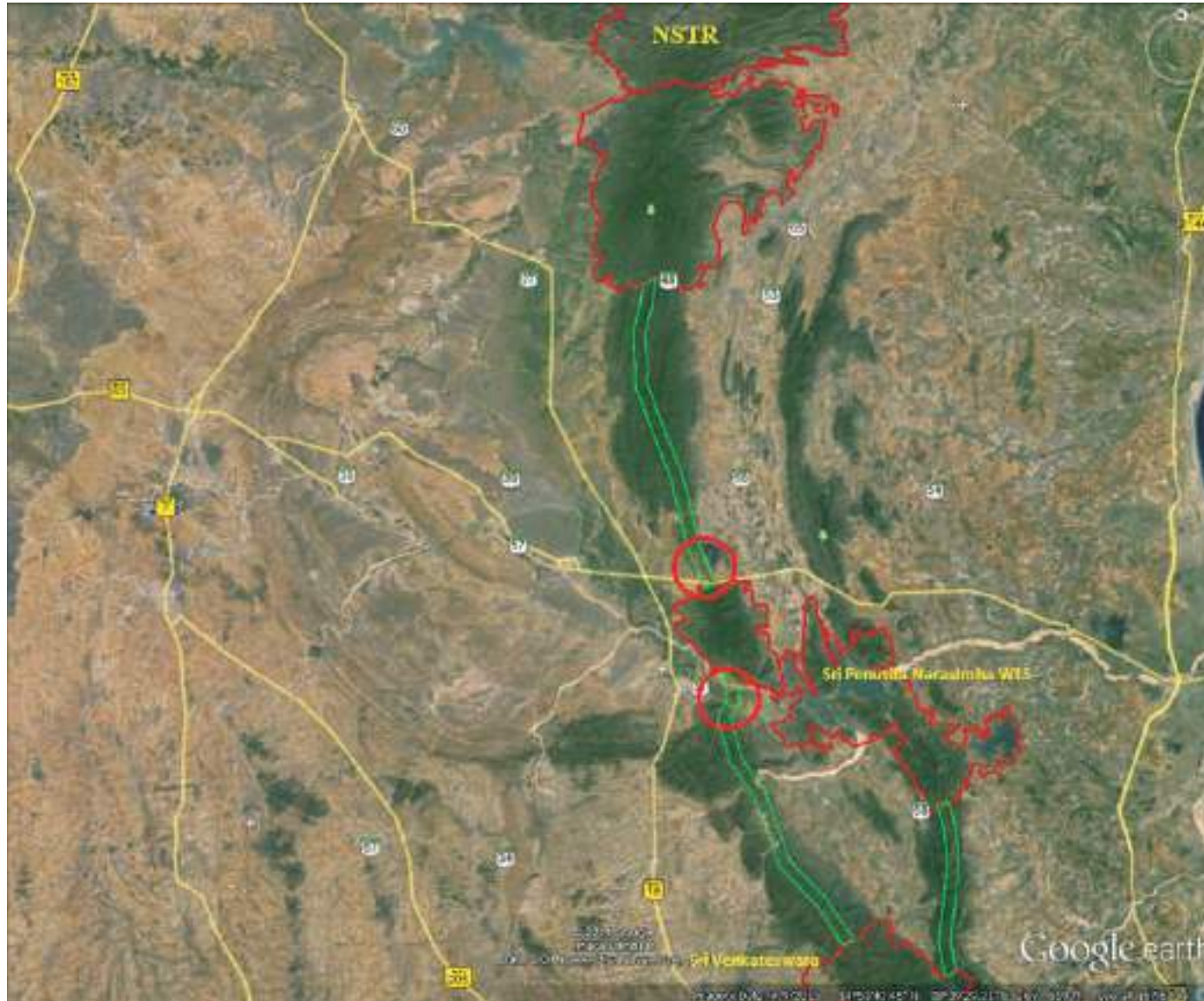


Figure 2.50:
*Potential bottlenecks ,
obstacles and weak
links within the Least
Cost Pathway corridor
connecting
Nagarjunsagar Sri
Sailam TR -Sri
Venkateswara NP*

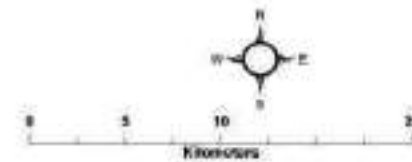
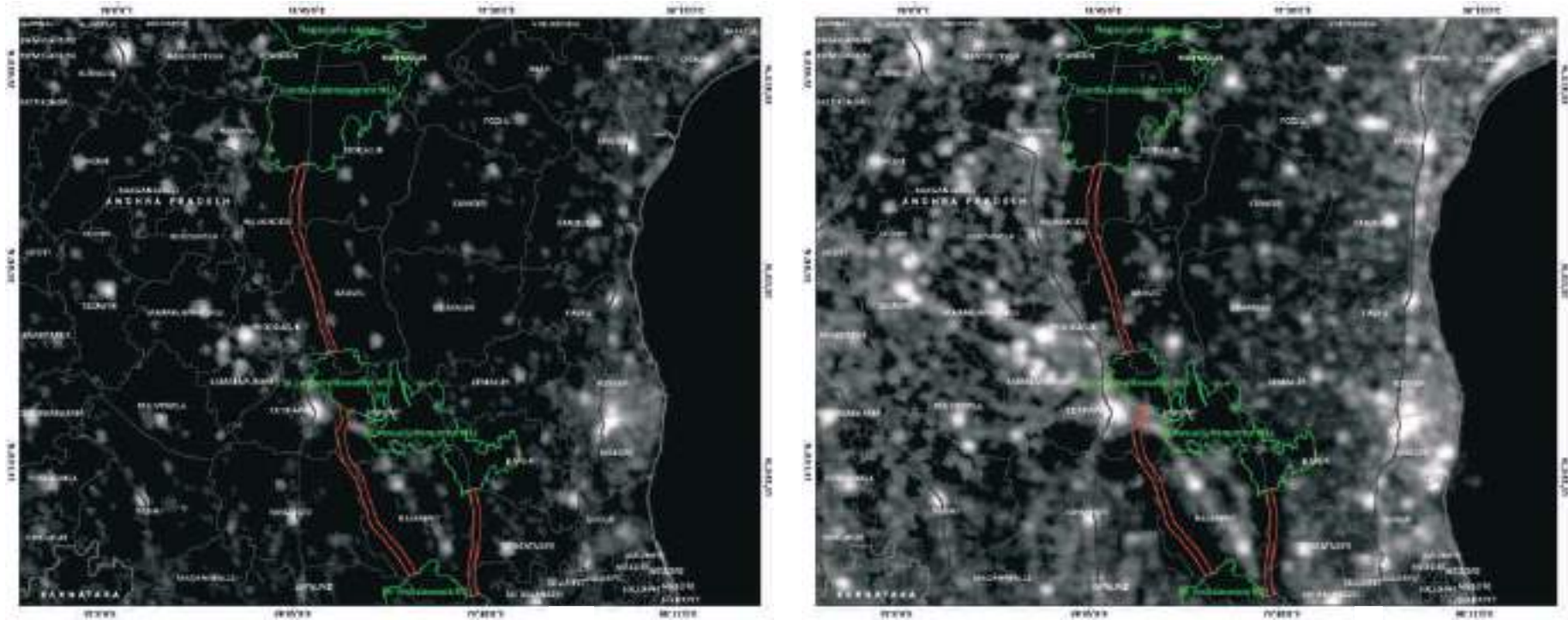


Figure 2.51:

Human habitation as depicted by nightlights within the Nagarjunsagar -Sri Sailam TR-Venkestwara NP landscape in the year 1992 and 2012

SAHYADRI-RADHANAGARI -GOA

The tiger population of the Sahyadris was connected with that of Goa through the Radhanagari Wildlife Sanctuary and further southwards with that of Anshi-Dandeli in Karnataka through the ridge-top forests of the Western Ghats. Tiger numbers estimated for the Sahyadris (20-22 tigers within 560 km²) seem to be over estimates.

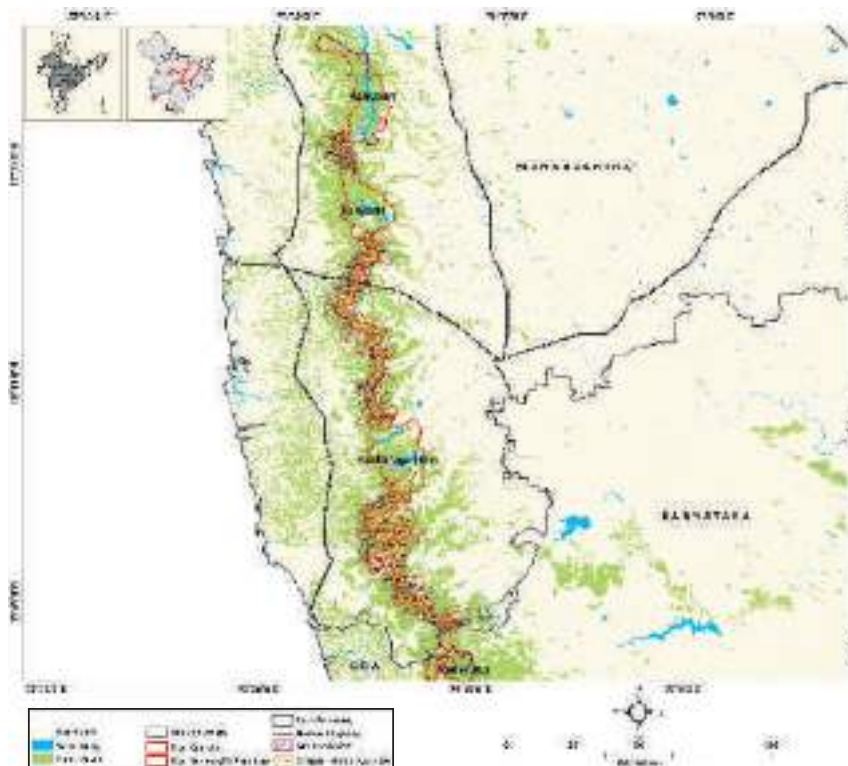


Figure 2.52:
Least Cost Pathway corridor for Tiger movement within Sahyadri-Radhanagri-Goa overlaid with village map (the village numbers are referenced in Table 2.12)

Sahyadri-Radhanagri- Goa

Habitat size	44453 Km ²
Source Population	NA
Size of Source	NA
Protected Areas	Koyana WLS Chandoli NP Radhanagri WLS Madei WLS (Goa)
Corridors	Koyana-Chandoli Chandoli-Radhanagari Radhanagri-Madei

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
4	Maharashtra	Kolhapur	Shahuwadi	Gavadi	124	603	133	575
5			Radhanagari	Savarde	282	1447	344	1696
6			Shahuwadi	Kumbhavde	111	631	170	753
7			Panhala	Padasali	38	195	42	199
8			Shahuwadi	Barki	125	615	125	668
9			Shahuwadi	Chalanwadi	42	178	45	164
10			Shahuwadi	Udgiri	315	1265	255	1123
11			Shahuwadi	Paraleninai	366	1762	348	1628
12			Shahuwadi	Amba	235	1136	256	1195
13			Shahuwadi	Talavade	74	392	145	554
14			Shahuwadi	Masnoli	223	1126	234	1190
15			Panhala	Washi	60	336	76	427
16			Shahuwadi	Gajapur	334	1736	447	1950
17			Shahuwadi	Vishalgad	84	540	107	588
18			Shahuwadi	Anuskura	256	1278	246	1089
19			Shahuwadi	Injoli	82	479	101	527
20			Bavda	Katali	170	769	116	544
21			Panhala	Kolik	148	756	184	1053
22		Satara	Patan	Gothane	48	227	63	289
22		Kolhapur	Panhala	Gothane	24	146	26	138
23			Bavda	Kode Bk	152	838	185	983
24			Bavda	Asalaj	260	1296	320	1619
25			Bhudragad	Anturli	173	762	175	807
26			Bavda	Vesaraf	97	472	104	525
27			Bavda	Sangashi	72	343	77	364
28			Bavda	Gagan Bavda	396	1909	353	1588
29			Bavda	Lakhamapur	88	486	88	445
30			Bavda	Borbet	125	629	122	645
31			Bavda	Narveli	42	194	53	263
32			Bavda	Taliye Kh.	56	282	91	393

Table 2.12:
Villages within the Least Cost Pathway Corridor between Sahyadri-Radhanagari-Goa as shown in Fig. 2.52

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
33			Radhanagari	Manbet	181	968	175	879
34			Chandgad	Isapur	110	412	102	376
35			Bhudragad	Shivdav	286	1313	222	958
36			Bhudragad	Chikkewadi	7	28	7	28
37			Bhudragad	Mathagaon	328	1490	323	1514
38			Bhudragad	Mani	24	114	35	148
39			Ajra	Kitvade	191	1019	222	974
40			Chandgad	Mirwel	85	268	88	258
41			Chandgad	Kodali	462	2058	350	1490
42			Sawantwadi	Kumbhavade	58	236	72	284
43			Patan	Bopoli	112	508	126	604
44			Patan	Thankal	82	418	90	387
45			Patan	Nechal	71	301	83	392
46			Patan	Mendheghar	61	272	62	296
47			Pajapur	Walwad	131	626	129	509
48			Pajapur	Kolamb	99	517	150	623
49			Dodamarg	Khadpade Tarf Banda	11	37	17	66
50			Dodamarg	Bhekurli	44	182	38	136
51			Dodamarg	Terwan	118	415	111	322
52			Lanja	Machal	96	415	95	427
53			Chiplun	Pophali Bk.(n.v.)	145	648	154	644
54		Ratnagiri	Chiplun	Pophali	967	4425	895	3609
55			Sangameshwar	Bamnoli	247	848	187	609
56			Pajapur	Zarye	131	486	116	390
57			Sangameshwar	Ninave	51	208	45	152
58			Lanja	Palu	252	1219	180	763
59			Chiplun	Mundhe Tarf Savarda	194	858	187	740
60			Chiplun	Durgwadi Kh.	262	1086	262	916
61			Chiplun	Durgwadi	118	538	77	303
62			Sangameshwar	Ozare Bk.	266	1044	237	754



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
63			Lanja	Kurang	163	711	154	561
64			Lanja	Kondage	200	862	193	733
65			Chiplun	Manjutri	36	157	19	66
66			Sangameshwar	Karandewadi (N.V.)	84	345	83	245
67			Sangameshwar	Khadi Kolvan	147	529	118	344
68			Lanja	Khorninko	218	791	191	586
69			Sangameshwar	Dakhin	121	627	165	580
70			Sangameshwar	Murshi	239	1010	230	811
71			Sangameshwar	Bhadkambe	315	1358	313	1273
72			Sangameshwar	Bhovade	205	974	208	795
73			Sangameshwar	Devade	393	1651	353	1253
74			Sangameshwar	Wadi Adhishti	62	246	49	159
75			Lanja	Prabhanvalli	580	2502	618	2377
76			Lanja	Bhambed	680	3042	663	2679
77			Lanja	Hardkhale	346	1608	344	1443
78			Pajapur	Yeradav	131	543	135	487
79			Pajapur	Pangari Kh.	106	434	63	221
80			Pajapur	Kajirda	240	1007	212	751
81			Pajapur	Karak	348	1420	390	1501
82			Kudal	Nileli	118	559	161	576
83		Satara	Patan	Torane	59	280	74	371
84			Patan	Waghane	42	185	32	125
85		Sindhudurg	Vaibhavvadi	Jambhavade	93	469	88	406
86			Vaibhavvadi	Mounde	114	474	114	384
87			Patan	Ghatmatha	32	195	43	197
88			Patan	Kemase	21	108	15	78
89			Patan	Kondhavale	126	588	160	818
90			Patan	Govare	84	366	121	624
91			Vaibhavvadi	Sadure	206	879	243	821
92			Patan	Patharpunj	45	198	56	260

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
93			Patan	Kolane	48	216	68	302
95			Vaibhavad	Ainari	153	648	148	566
96			Vaibhavad	Bhui Bawada	298	1205	310	1102
97			Kudal	Wasoli	151	569	152	509
98			Vaibhavad	Ringewadi	89	334	87	281
99			Vaibhavad	Kurli	423	1941	297	1181
100			Dodamarg	Zolambe	262	1263	266	1104
101			Dodamarg	Hewale	96	430	106	449
102			Dodamarg	Fukeri	70	300	79	309
103			Sawantwadi	Fansavade	57	395	48	251
104			Vaibhavad	Bhattiwadi	80	332	90	285
105			Vaibhavad	Karul	277	1204	280	1058
106			Vaibhavad	Navale	201	1005	222	939
107			Vaibhavad	Shirale Arule	60	272	72	229
108			Sawantwadi	Konas	114	503	132	487
109			Kudal	More	161	764	184	931
110			Sawantwadi	Kesari	148	653	152	700
111			Kankavli	Yevteshwargaon	101	441	108	408
112			Kudal	Narur	217	1090	283	1112
113			Sawantwadi	Shirshinge	468	2132	484	1810
114			Kudal	Sakirde	46	204	56	192
115			Kudal	Durganagar	108	456	120	430
116			Kudal	Bharani	236	1091	250	1043
117			Kudal	Ghotage	411	1622	406	1550
118			Kudal	Pangrad	292	1284	287	1055
119			Kudal	Nerur K.narur	399	1757	440	1633
120			Kudal	Pulas	144	730	165	701
121			Sawantwadi	Gharap	74	328	64	283
122			Kudal	Anjivade	60	226	61	189
123			Kudal	Shivapur	251	988	294	1055



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
124			Kudal	Keravade K.narur	253	1182	313	1373
125			Kudal	Chafeli	81	416	122	473
126			Kudal	Upavade	119	522	153	497
127			Sawantwadi	Sawarwad	210	1166	232	1231
128			Sawantwadi	Sangeli	623	2837	698	2855
129			Sawantwadi	Verle	469	1965	473	1754
130			Sawantwadi	Kalambist	552	2210	553	2005
131			Sawantwadi	Ambegaon	221	1083	267	1163
132			Sawantwadi	Ovaliye	152	624	157	621
133			Sawantwadi	Madkhol	742	3448	829	3539
134			Sawantwadi	Parpoli	181	751	178	593
135			Sawantwadi	Devsu	177	722	171	741
136			Sawantwadi	Kegad	115	562	129	497
137			Sawantwadi	Danoli	75	305	79	263
138			Sawantwadi	Chaukul	400	1555	397	1254
139			Sawantwadi	Udeli	2	4	3	8
140			Dodamarg	Terwanmedhe	125	478	120	504
141			Dodamarg	Ghatiwade	7	35	12	60
142			Dodamarg	Palye	111	517	113	474
143			Dodamarg	Sonawal	91	415	112	515
144			Patan	Valvane	NA	NA	NA	NA
145			Bhudragad	Hanamante	NA	NA	NA	NA
146			Shahuwadi	Golivane	NA	NA	NA	NA
147			Shahuwadi	Wadi Kalkavane	NA	NA	NA	NA
148			Dodamarg	Sargave	28	93	NA	NA
149			Dodamarg	Aynode	130	631	NA	NA
150			Dodamarg	Kendre Kh.	7	37	NA	NA
151			Dodamarg	Pal	41	184	NA	NA
152			Dodamarg	Kendre Bk.	13	55	NA	NA

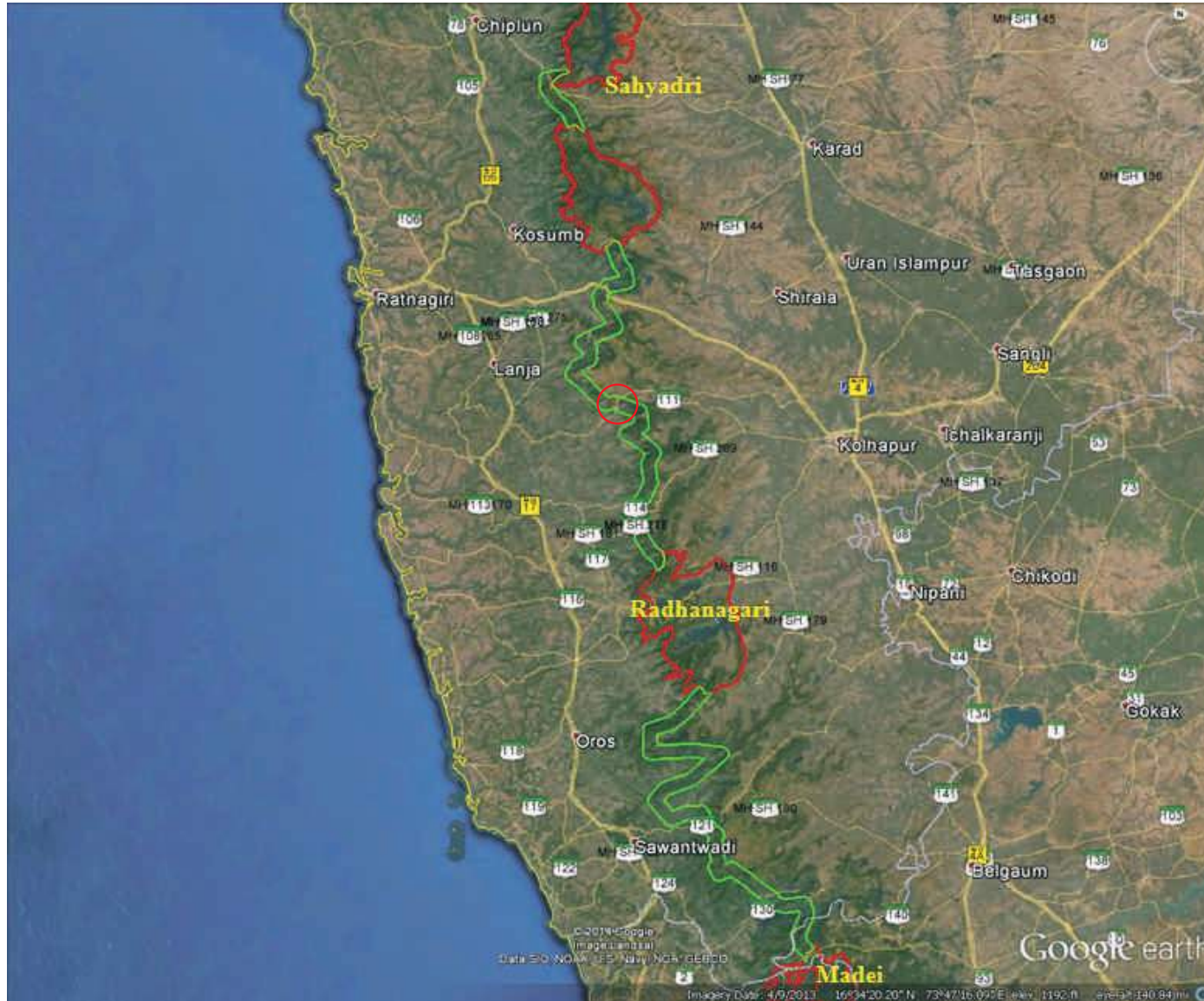


Figure 2.53:
 Potential bottlenecks ,
 obstacles and weak
 links within the Least
 Cost Pathway corridor
 connecting Sahyadri-
 Radhanagri-Goa

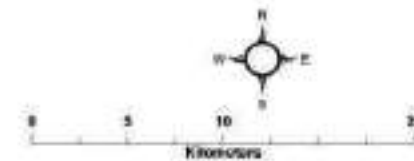
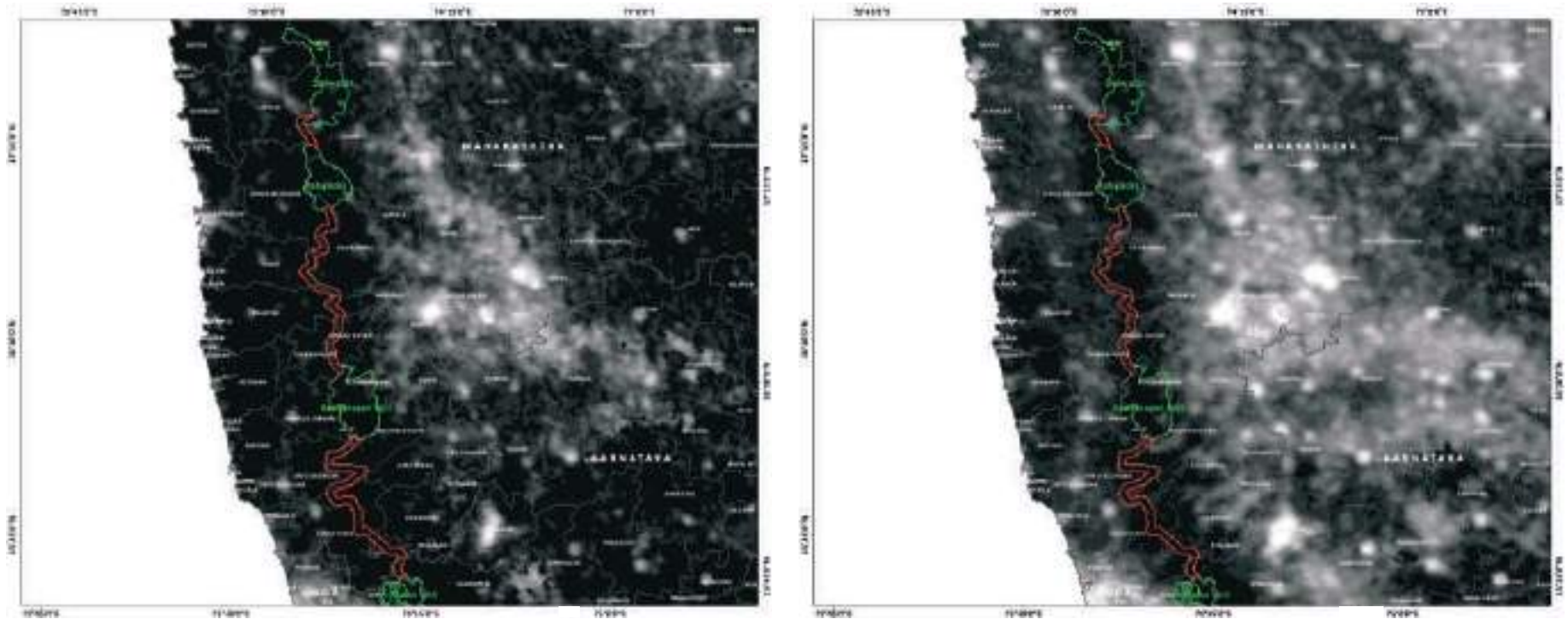


Figure 2.54:

Human habitation as depicted by nightlights within the Sahyadri-Radhanagari-Goa landscape in the year 1992 and 2012



WESTERN GHATS



3

WESTERN GHATS LANDSCAPE

From an ecological perspective, this region with a total forested area of 1,01,467 km² (Qureshi et al. 2006) comprising of nine notified Tiger Reserves, three proposed Tiger Reserve, viz., Sathyamangalam Tiger Reserve in Tamil Nadu and Kudremukh and Biligiri Rangaswamy Temple Hills (BRT) Wildlife Sanctuary in Karnataka; 20 National Parks and about 68 Wildlife Sanctuaries forms one of the largest Protected Area networks in India. The Nilgiri and Agasthiya-Malai Biosphere Reserves are also located within this zone in addition to several Reserved Forests and sacred groves, totalling to about 5.8% of the total forested area in the Western Ghats alone. This landscape has the potential to have contiguous tiger occupancy from the Dang forests in Gujarat up to the Palakkad Gap in Kerala and then again from Parambikulam-Indira Gandhi complex upto Kalakad-Mundanthurai Tiger Reserve. Within this landscape the most important source population is the Nagarahole-Mudumalai-Wayanad population which spans the three States of Karnataka, Tamil Nadu and Kerala with a high density (average density of over 4 tigers per 100 km²) tiger population occupying a large area (over 9000 km²). The other sources though occupying sufficiently large patches of habitat are of low tiger density (1-2 tigers per 100 km²) and their nuclei are centred within Protected Area complexes. These source populations are Kalakad-Mundanthurai, Periyar and the Parambikulam-Indira Gandhi complex south of the Palakkad Gap, while Kudremukh, Bhadra, Anshi and Dandeli are north of the Palakkad Gap. A few tigers are also recorded from the forests in Goa and from the Sayahadri Tiger Reserve in

Maharashtra. The populations in Goa and Maharashtra depend significantly on the narrow forest connectivity of the Western Ghat ridge.

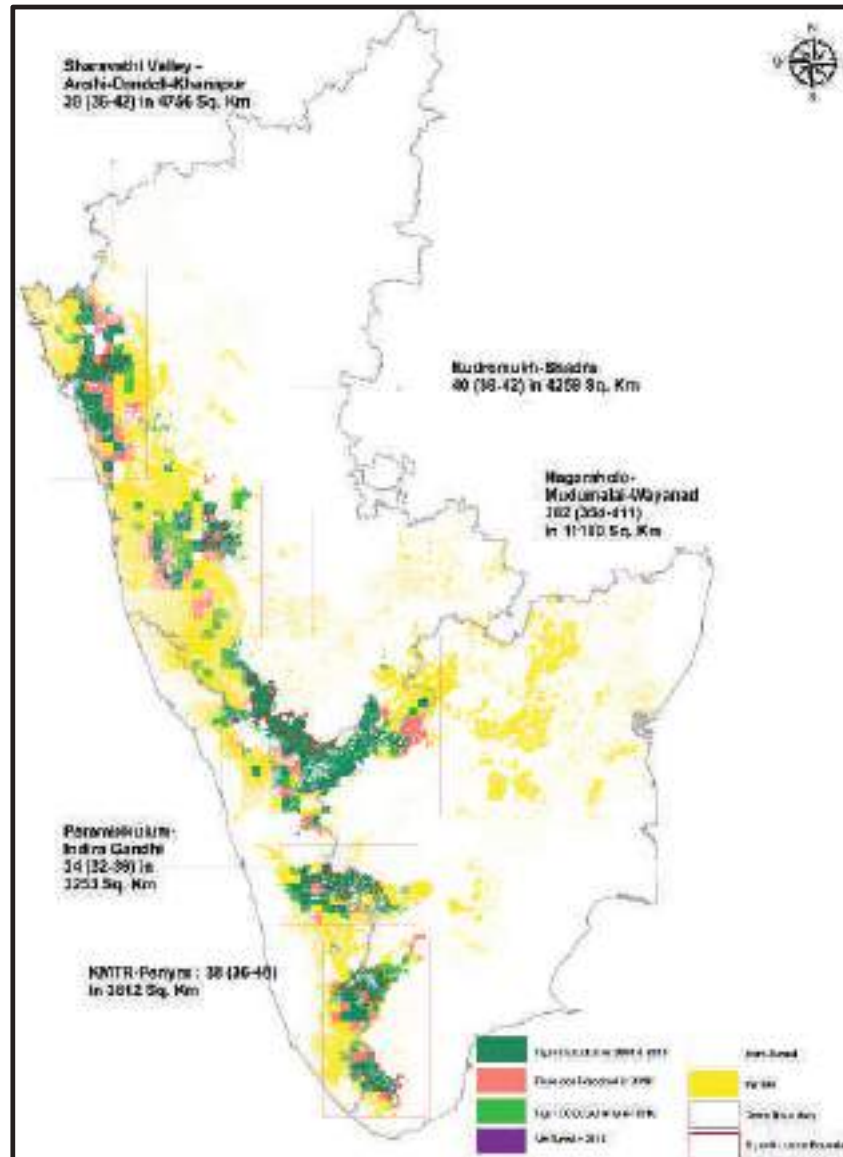
The Western Ghat tiger populations are more connected with each other when compared to tiger populations in Central India and the Shivalik-Gangetic Plains landscapes. The habitat matrix in the Western Ghats is more conducive for tiger occupancy. However, the habitat connectivity is threatened by plantations, agriculture, industrial and infrastructural development. It would be prudent to timely identify and legitimize the minimal corridors needed for the conservation objective of ensuring gene flow between the Western Ghats tiger populations in times to come. The major impediments to tiger conservation in this zone are the existence of hydro-electric projects, hunting (Madhusudan and Karanth 2002) and deforestation of large areas for commercial plantations.

The Least Cost Path analysis provides the optimal corridor between Protected Areas. The minimal corridors defined here need to be safeguarded through policy and formal legislation. A designation of "ecosensitive areas" to these minimal habitat corridors would ensure that land uses within these corridors are not altered to such drastic levels that the corridors become non-functional and lose their conservation significance. These corridors have been designed based on the habitat potential for supporting tigers (occupancy probability), however, they would also fulfill the needs of many other wildlife species.



Figure 3.1:

Habitat Connectivity in Western Ghats Landscape



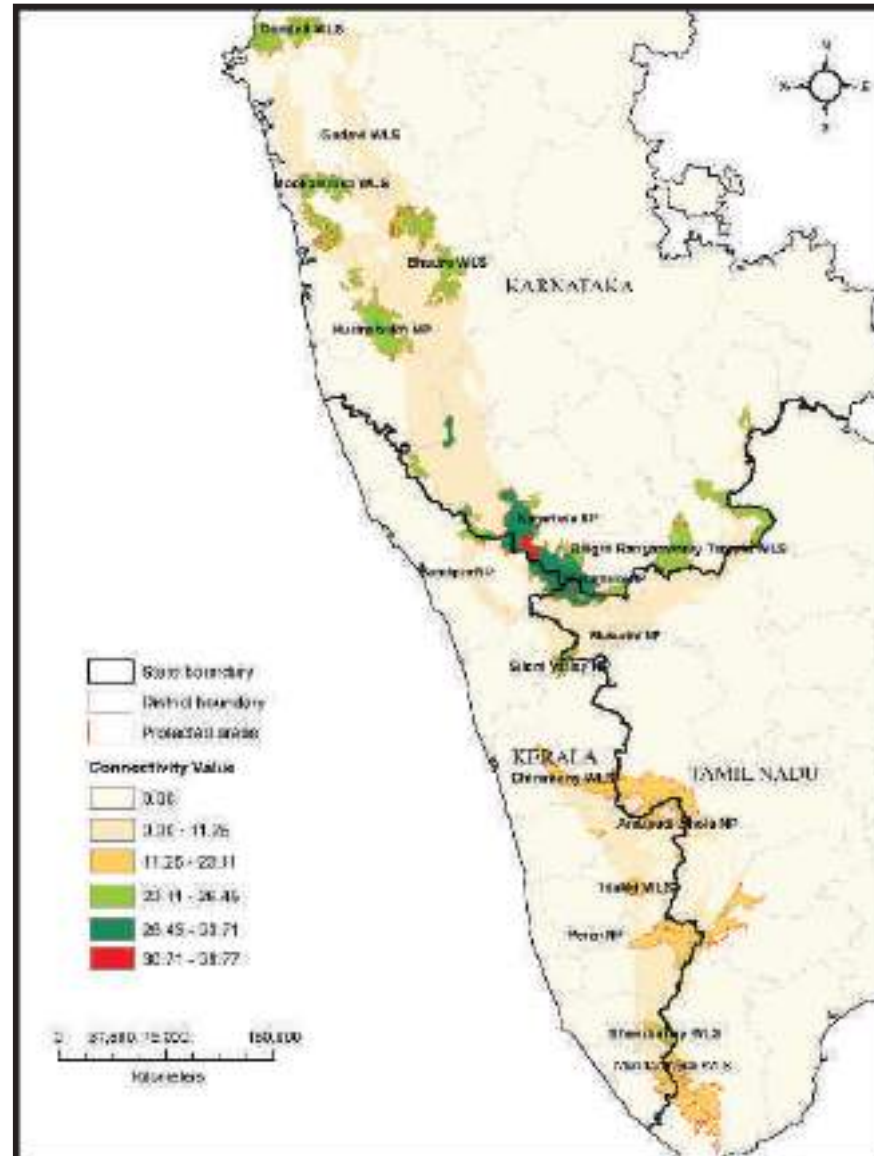


Figure 3.2:
Potential habitat connectivity for tiger movement between Western Ghats as depicted by CIRCUITSCAPE model

ANSHI-DANDELI-SHARAVATHI VALLEY

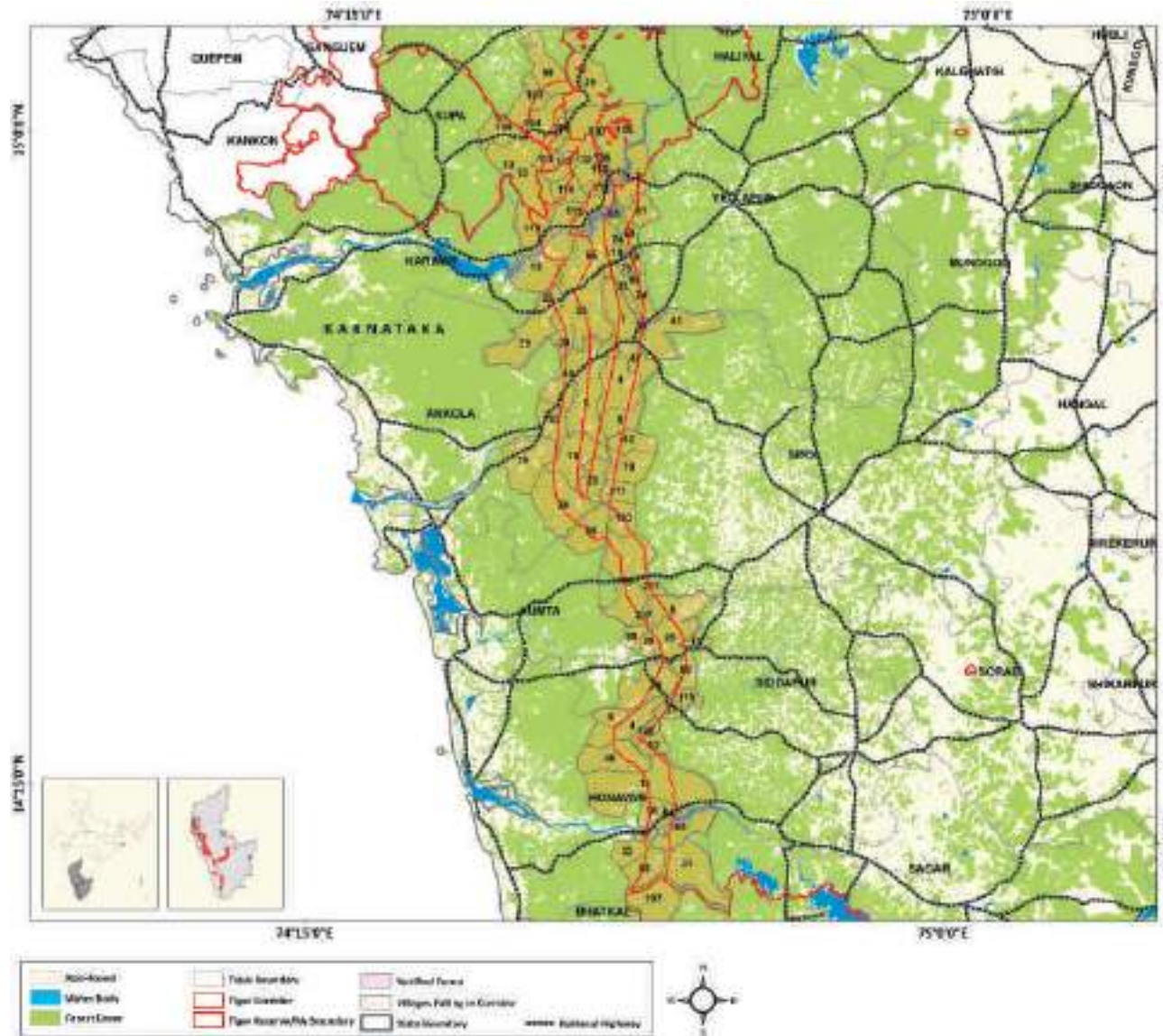
This complex consists of the protected areas of Mollam-Netravali, Anshi-Dandeli, Sharavathi Valley-Mookambika along with Reserved Forests of Haliyal and Yellapur. To the north, this complex is connected to the forests of Goa which continue to the Sahayadri Tiger Reserve in Maharashtra with sporadic records of tiger occupancy. While the forest connectivity between this complex and the southern Kudremukh-Bhadra complex is weak, interspersed by plantation and agricultural mosaics, evidence exists through camera trapped pictures to confirm movement of tigers between the two areas (Ullas Karanth, Pers. Com.). Tiger population in 2010 within this region was estimated to be between 36 and 42 tigers with occupancy in an area of 4,756 km², indicating a decline in tiger occupied area since 2006. This decline was observed in the forests connecting Anshi-Dandeli to forests of Goa in the north and to forests of Sharavathi Valley in the south.

Anshi and Dandeli are connected through contiguous forests, the least cost pathways (north of Ulavi settlement), formalizing this connectivity would secure these forests for the future. The corridor connectivity between Anshi-Dandeli and Sharavathi Valley is long and traverses through plantation and agriculture mosaics. However, the least cost pathway and Circuitscape flows minimizes passage through private lands and suggests the ideal corridor to connect the two major tiger landscapes of Karnataka. Two corridors, one from Anshi and another from Dandeli emerge from either side of the Kodalalli Reservoir and meet north of the Benne Hole falls. The bottlenecks for this corridor were at Jog Falls where a narrow strip of forest (1.5 km) remains as a connectivity. This connectivity, if formally recognized and restored would promote gene flow across major populations of the Western Ghats from Pune to Palakkad.

Anshi-Dandeli-Sharavathi Valley Corridor	
Habitat size	40589 Sq. Km ²
Source Population	Anshi NP Dandeli WLS
Size of Source	39 (36-42) tigers in 4756 Km ²
Protected Areas	Anshi NP Dandeli WLS Sharavathi WLS
Corridors	Dandeli-Sharavathi WLS Anshi-Sharavathi WLS Dandeli-Anshi WLS

Figure 3.4:

Least Cost Pathway corridor for Tiger movement between Anshi-Dandeli-Sharavathi Valley overlaid with village map (the village numbers are referenced in Table 3.1)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Karnataka	Karwar	Yellapur	Joglepal	10	49	9	42
2			Yellapur	Bare	166	852	204	877
3			Yellapur	Kattige	82	415	419	1898
4			Yellapur	Targar	30	165	37	171
5			Yellapur	Vajralli	134	630	133	552
6			Yellapur	Kodlagadde	57	322	245	943
7			Yellapur	Mavinamane	342	1746	397	1748
8			Yellapur	Gullapur	175	773	226	893
9			Yellapur	Bare	166	852	204	877
10			Yellapur	Kodlagadde	57	322	245	943
11			Yellapur	Bigar	42	231	43	192
12			Yellapur	Geral	91	422	81	398
13			Yellapur	Balagara	134	759	143	627
14			Yellapur	Barballi	36	127	Na	Na
15			Yellapur	Kalche	268	1208	298	1075
16			Yellapur	Baginakatte	37	156	32	124
17			Yellapur	Hongadde	57	245	56	222
18			Ankola	Shevkar	63	420	73	448
19			Ankola	Sunkasal	208	966	229	930
20			Ankola	Kodlagadde	211	937	245	943
21			Ankola	Halvalli	307	1361	345	1461
22			Ankola	Dongri	127	635	145	660
23			Ankola	Kammani	38	168	54	217
24			Ankola	Hebbul	97	503	119	533
25			Ankola	Kuntgani	186	933	247	1030
26			Ankola	Hillur	512	2366	620	2499
27			Ankola	Manigadde	23	140	30	137
28			Ankola	Achave	406	1853	490	1969
29			Ankola	Kalleshvar	NA	NA	NA	NA
30			Honavar	Hulegar	284	1126	190	629

Table 3.1

Villages within the Least Cost Pathway Corridor between Anshi-Dandeli-Sharavathi Valley as shown in Fig. 3.4

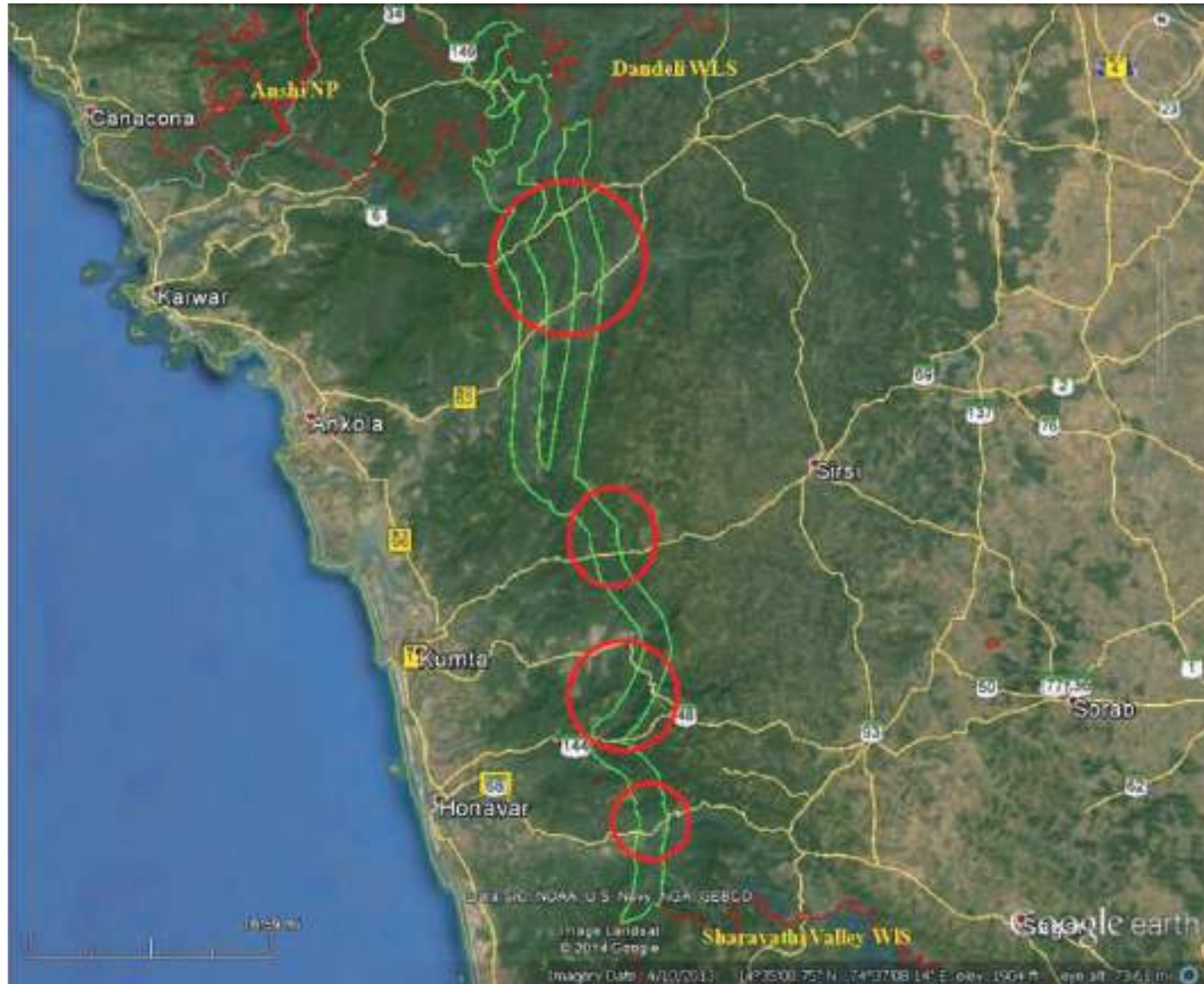
Village_id	State	District	Tehsil	Village	No Of Household (2001)	Total Population (2001)	No Of Household (2011)	Total Population (2011)
31			Honavar	Jan	NA	NA	NA	NA
32			Honavar	Kabbinahakkal	NA	NA	NA	NA
33			Honavar	Heggargadde	NA	NA	NA	NA
34			Honavar	Hirebail	200	937	268	1062
35			Honavar	Hosgod	40	229	52	264
36			Honavar	Mahime	505	2308	594	2685
37			Honavar	Hadgeri	79	348	93	389
38			Honavar	Shirkur	74	336	84	378
39			Honavar	Nagarbastikere	712	3476	787	3617
40			Honavar	Kandoddi	54	282	69	359
41			Joida	Hebbal	19	106	755	3833
42			Joida	Bidoli	57	264	71	296
43			Joida	Amboli	171	916	190	956
44			Joida	Yarmukh	98	432	99	413
45			Joida	Chaper	16	67	20	86
46			Joida	Bhedasgadde	NA	NA	NA	NA
47			Joida	Kodagihittal	NA	NA	NA	NA
48			Joida	Shivapura	46	200	9	33
49			Joida	Tulasageri	4	14	3	9
50			Joida	Ulvi	135	735	178	767
51			Joida	Netragi	Na	Na	Na	Na
52			Joida	Kodatalli	Na	Na	Na	Na
53			Joida	Birkoi	121	381	63	244
54			Joida	Sulageri	NA	NA	NA	NA
55			Karwar	Devkar	120	409	91	397
56			Kumta	Medini	47	254	64	268
57			Kumta	Morse	35	140	41	165
58			Kumta	Bangane	75	409	109	474
59			Kumta	Yan	94	427	125	495
60			Kumta	Negalagone	NA	NA	NA	NA

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
61		Shimoga	Sagar	Uralagallu	36	150	41	133
62		Karwar	Siddapur	Hallibail	71	389	79	354
63			Siddapur	Nilkund	43	201	63	247
64			Siddapur	Bilegod	75	440	89	423
65			Siddapur	Kodigadde	60	301	83	372
66			Siddapur	Hukkali	31	173	49	201
67			Siddapur	Gijagini	51	303	67	324
68			Siddapur	Niragod	7	26	10	37
69			Sirsi	Kelaginkeri	68	377	84	385
70			Sirsi	Mundaganamane	122	555	128	588
71			Sirsi	Hosur	26	112	29255	116821
72			Sirsi	Harsimane	50	227	54	223
73			Sirsi	Bengaon	137	641	170	695
74			Sirsi	Hebre	207	957	229	947
75			Sirsi	Bugadi	5	14	5	27
76			Joida	Gund	67	321	64	300
77			Joida	Bidoli	57	264	71	296
78			Joida	Shidoli	Na	Na	Na	Na
79			Joida	Amboli	171	916	190	956
80			Joida	Ambarade	NA	NA	NA	NA



Figure 3.5:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Anshi-Dandeli-Sharavathi Valley



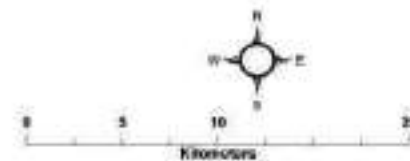


Figure 3.6:
Human habitation as depicted by nightlights within the Anshi-Dandeli-Sharavathi Valley landscape in the year 1992 and 2012

KUDREMUKH-BHADRA

This complex comprises of the central part of the Western Ghats in Karnataka and includes Kudremukh National Park and Bhadra Tiger Reserve. Kudremukh National Park is a proposed Tiger Reserve site and occupies parts of Karkala taluka in Udupi, Belthangadi taluka in Dakshin Kannada and Mudigere, Sringeri and Koppa taluka in Chikmagalur district. Immediately north of Kudremukh is Someshwara Wildlife Sanctuary while Shettihalli Wildlife Sanctuary is located north of Bhadra Tiger Reserve. While this region has relatively low abundance of tigers, the area holds good potential for tiger persistence. The tiger population in 2010 within this complex was estimated to be between 38 and 42 tigers with occupancy in an area of 4,258 km². The area occupied by tigers and the estimated tiger population within this landscape showed a decline in 2010 compared to 2006. The loss in tiger occupancy was observed in the forests south of Bhadra (Chikmagalur taluka), and south-west of Kudremukh (Belthangadi taluka). To the south of this tiger complex is the Nagarahole-Mudumalai-Wayanad complex, with small Protected Areas in-between such as Pushpagiri Wildlife Sanctuary and Talakaveri Wildlife Sanctuary connected with Brahmagiri Wildlife Sanctuary by Padinalknad and Kerti Reserved Forests. The intervening habitat matrix between the Protected Area complexes consist of plantations, agriculture and some scattered habitation along with other Reserved Forests such as Kabbinala, Kagneri and Kiribag. The corridor linkages identified within this landscape and between this landscape and tiger landscapes to the north and south by least cost pathways and Circuitscape flows are essential elements to ensure long term tiger persistence. Connectivity between the Protected Areas within the Kudremukh-Bhadra complex was patchy.

Kudremukh-Pushpagiri Corridor

Habitat size	40589 Km ²
Source Population	Kudremukh-Bhadra
Size of Source	40 (38-42) tigers in 4258 Km ²
Protected Areas	Kudremukh WLS Pushpagiri WLS
Corridors	Kudremukh NP-Pushpagiri WLS

Someshwara WLS-Kudremukh NP-Bhadra WLS Corridor

Habitat size	40589 Km ²
Source Population	Kudremukh-Bhadra
Size of Source	40 (38-42) in 4258 Km ²
Protected Areas	Kudremukh NP Someshwara WLS Bhadra WLS
Corridors	Kudremukh NP-Someshwara WLS Kudremukh NP-Bhadra WLS

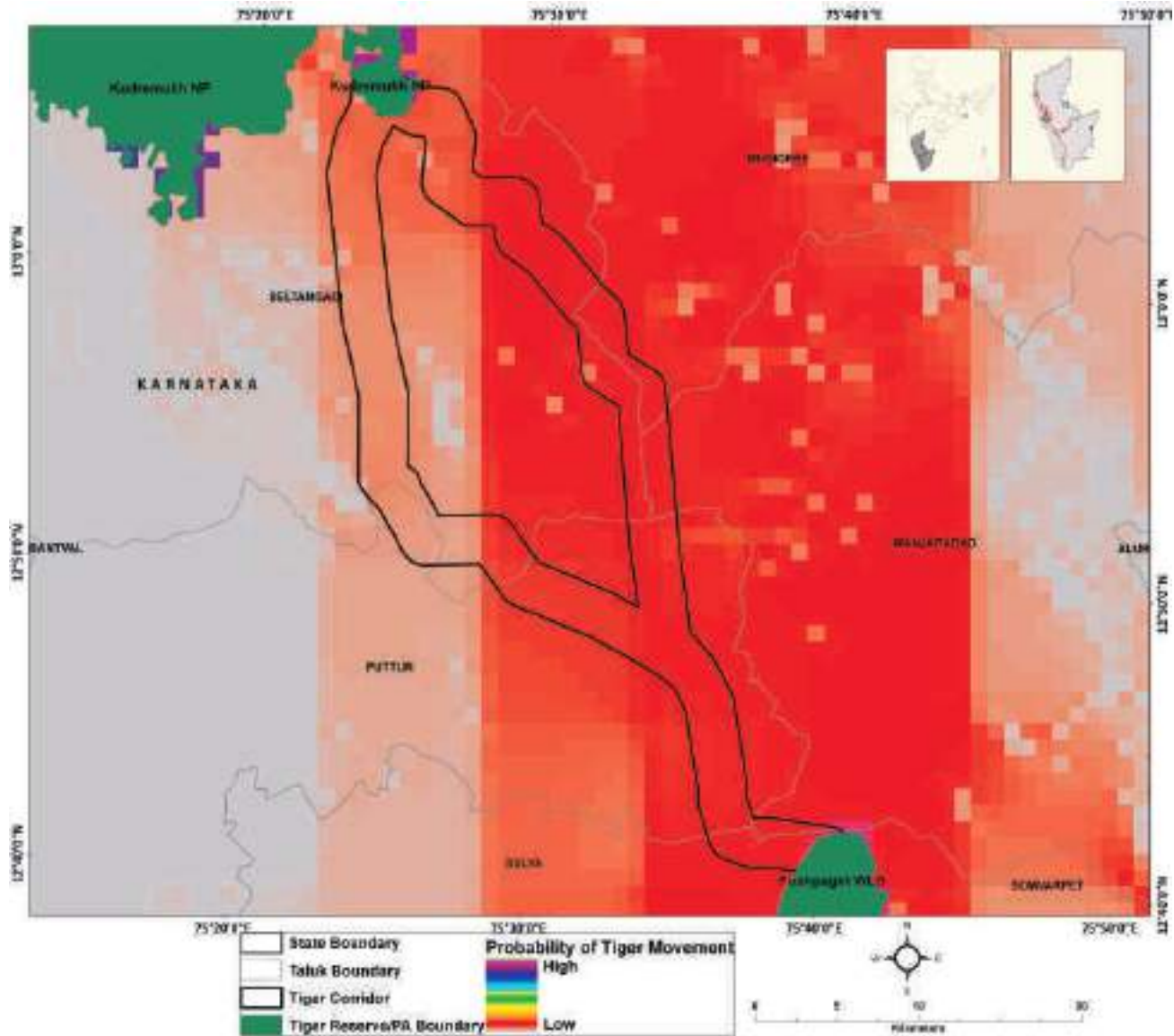
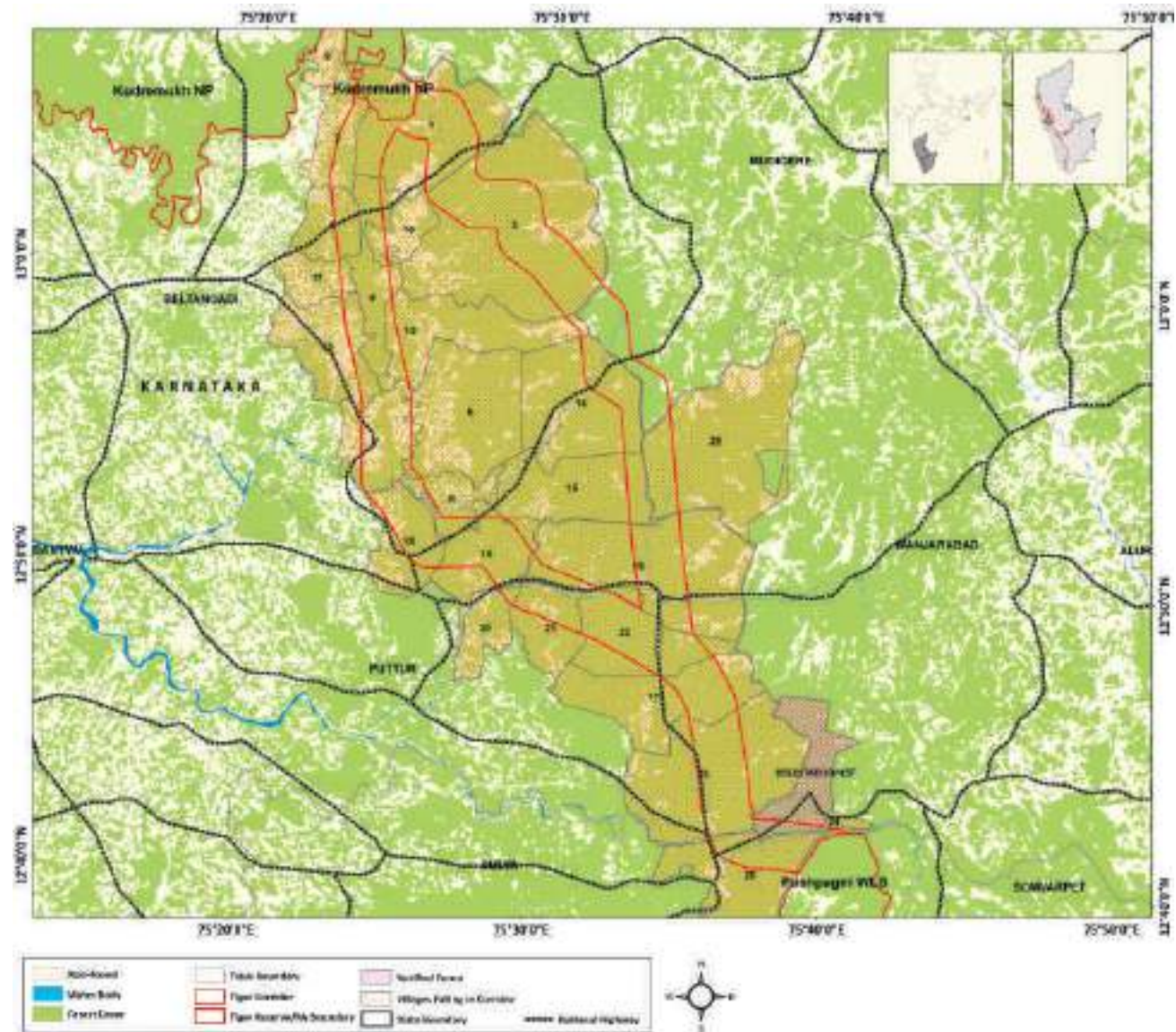


Figure 3.7:
Potential habitat connectivity for tiger movement between Kudremukh-Pushpagiri Corridor as depicted by CIRCUITSCAPE model

Figure 3.8:

Least Cost Pathway corridor for tiger movement between Kudremukh-Pushpagiri overlaid with village map (the village numbers are referenced in Table 3.2)



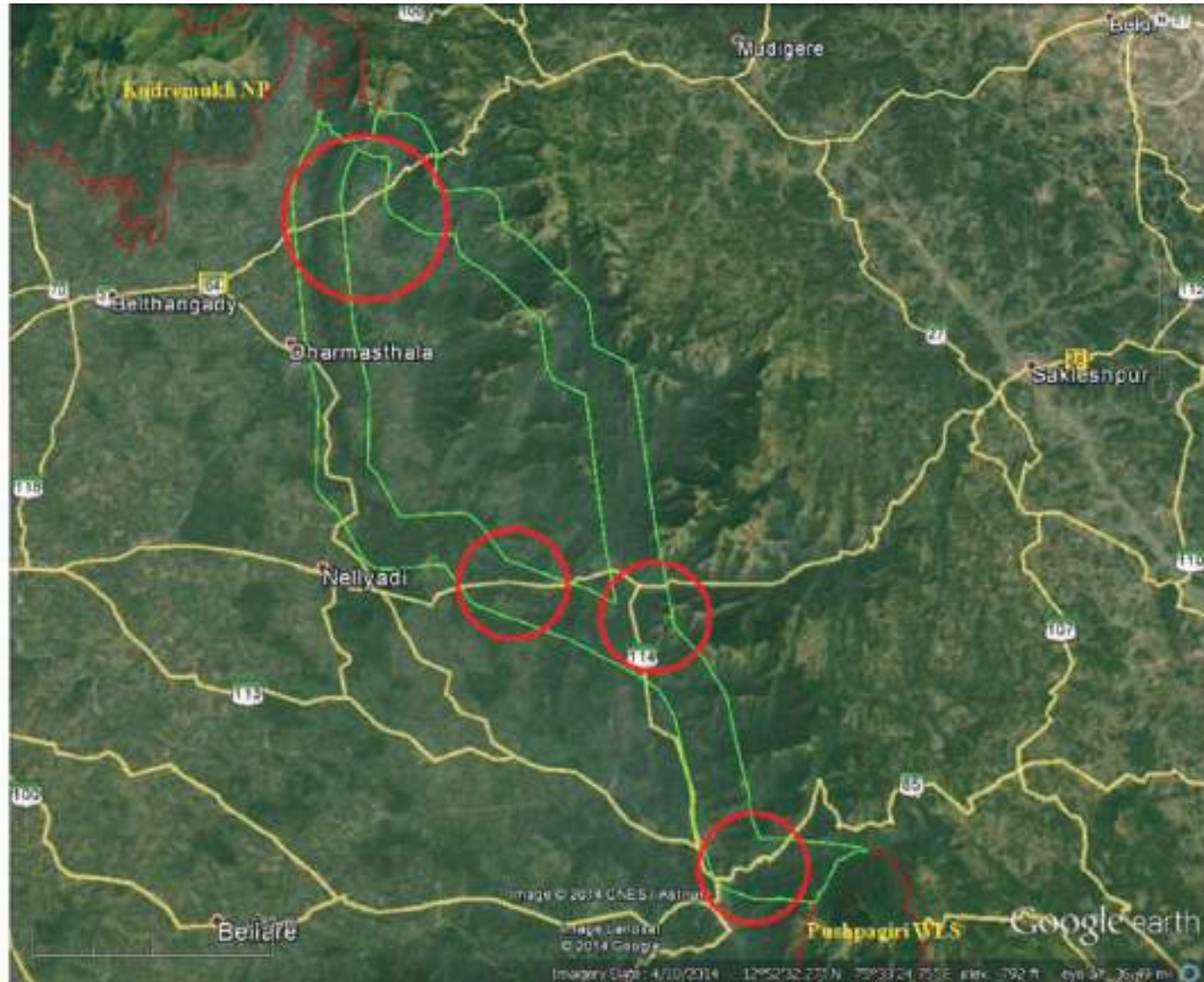
Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Karnataka	Mangalore	Belthangadi	Charmadi	818	4668	977	5169
2			Belthangadi	Kadirudyavara	626	3360	737	3421
3			Belthangadi	Neriya	1213	6191	1394	6802
4			Belthangadi	Chibidre	360	2212	462	2372
5			Belthangadi	Mundaje	770	3804	903	4259
6			Belthangadi	Kalanja	907	4515	1057	4988
7			Belthangadi	Nidle	579	2905	667	3025
8			Belthangadi	Hathyadka	590	2835	629	2789
9			Belthangadi	Mittabagilu	613	3341	773	4002
10			Belthangadi	Totatadi	634	3222	750	3591
11			Belthangadi	Kalmanja	589	3192	771	3709
12			Belthangadi	Puduvetta	612	3060	731	3343
13			Belthangadi	Dharmastala	1868	9258	2181	9818
14			Belthangadi	Shisla	434	2070	471	2090
15			Belthangadi	Shibaje Male	Na	Na	Na	Na
16			Belthangadi	Rekya	450	2092	500	2079
17			Puttur	Kombar	525	2586	592	2684
18			Puttur	Koukradi	815	4281	1039	4916
19			Puttur	Shiradi	672	3164	746	2933
20			Puttur	Nujibaltilla	682	3320	759	3278
21			Puttur	Kenje	Na	Na	Na	Na
22			Puttur	Shirivagilu	143	714	153	667
23			Puttur	Bilenele	740	3501	819	3580
24		Hassan	Sakaleshpur	Na	Na	Na	82	335
25			Sakaleshpur	Kumarhalli	Na	Na	Na	Na
26			Sakaleshpur	Bislestateforest	Na	Na	Na	Na
27		Mangalore	Sulya	Subrahmanya	810	3447	1012	4443

Table 3.2:

Villages within the Least Cost Pathway Corridor between Kudremukh-Pushpagiri Valley as shown in Fig. 3.8

Figure 3.9:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kudremukh-Pushpagiri



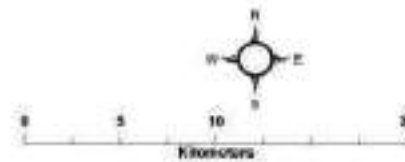
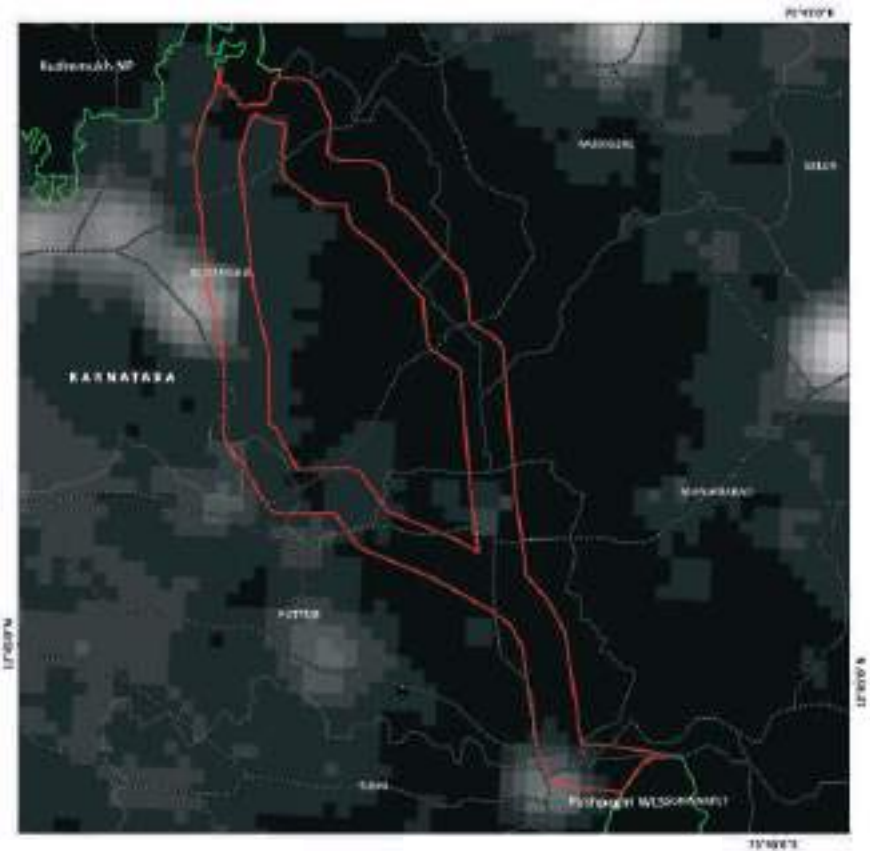
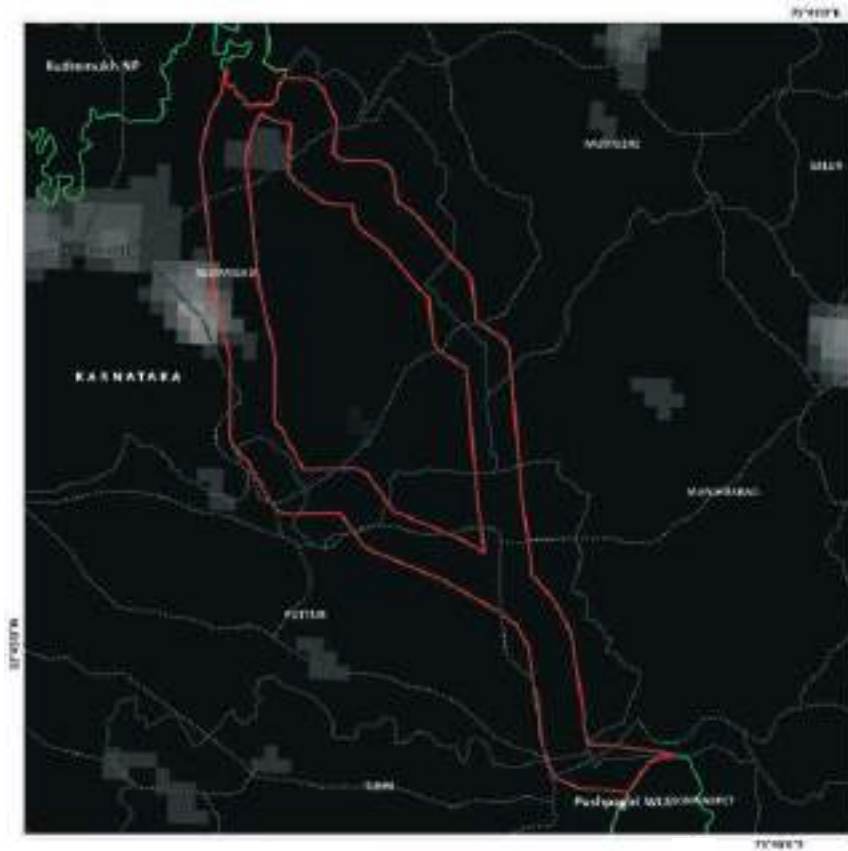
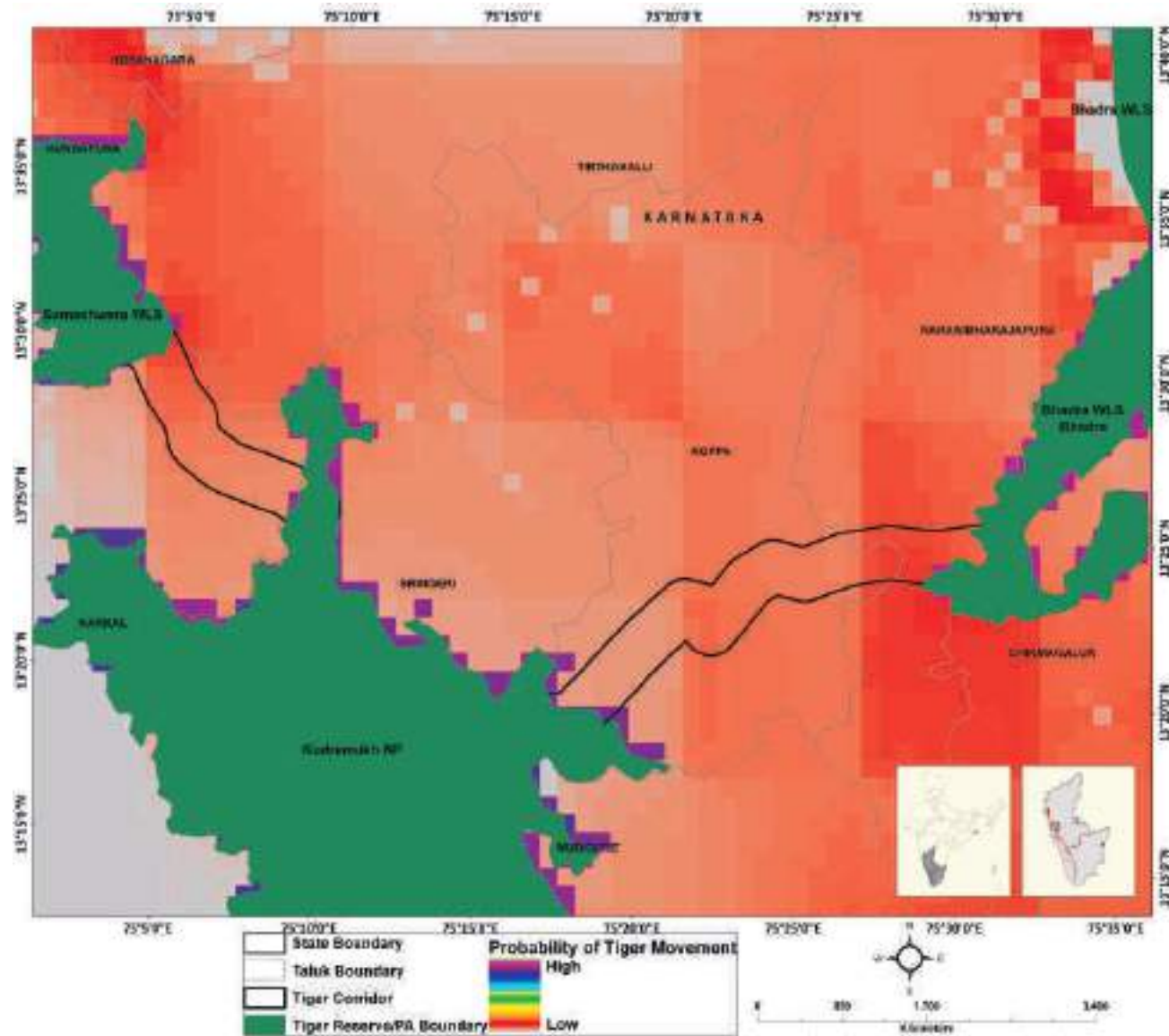


Figure 3.10:
Human habitation as depicted by nightlights within the Kudremukh-Pushpagiri Corridor landscape in the year 1992 and 2012

Figure 3.11:

Potential habitat connectivity for tiger movement between Someshwara WLS-Kudremukh NP-Bhadra WLS Corridor as depicted by CIRCUITSCAPE model



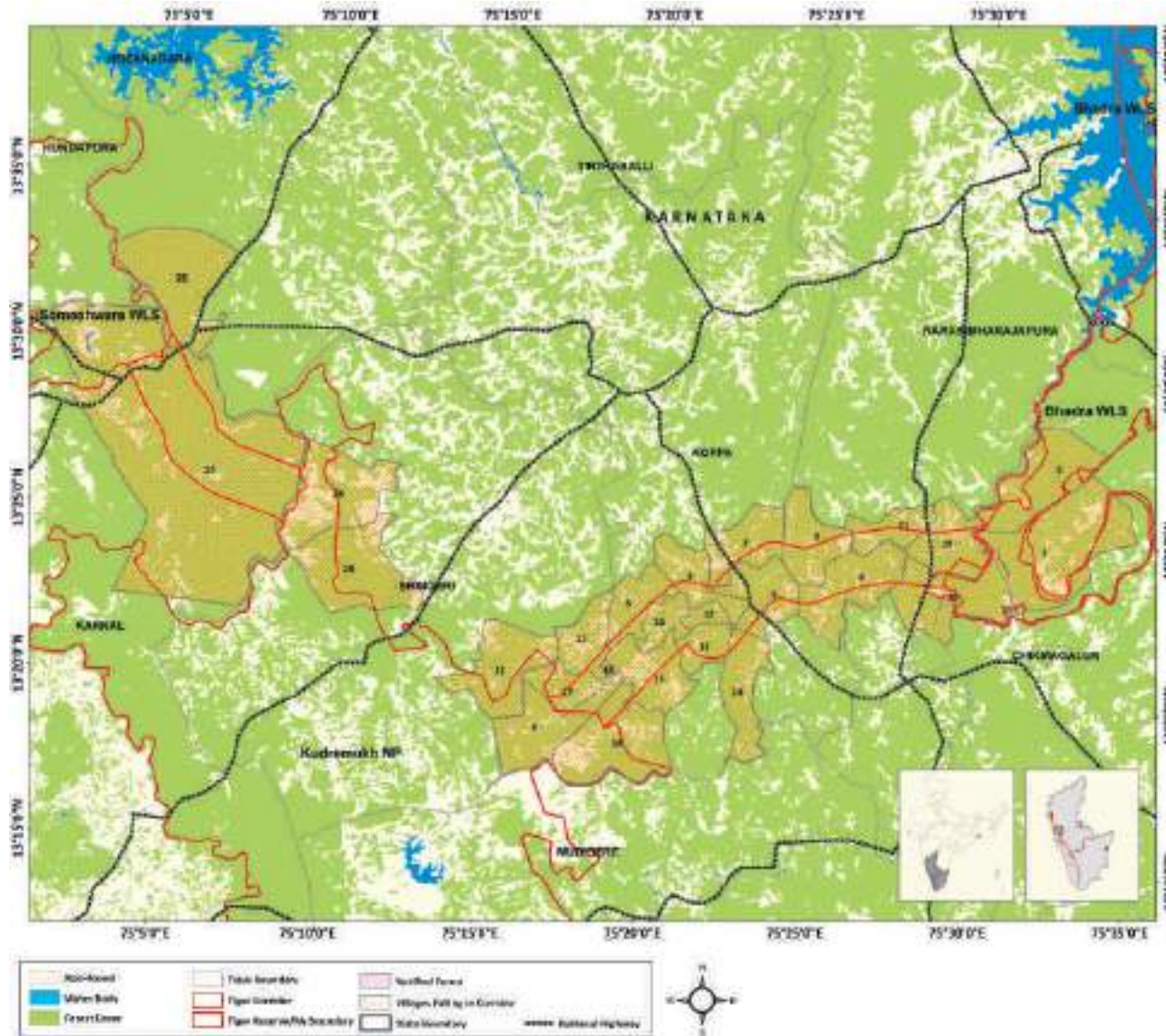


Figure 3.12: Least Cost Pathway corridor for tiger movement between Someshwara WLS- Kudremukh NP-Bhadra WLS overlaid with village map (the village numbers are referenced in Table 3.3)

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Karnataka	Chikmagalur	Chikmagalur	Bidare	606	2727	557	2250
2			Chikmagalur	Shirgota	166	705	140	504
3			Koppa	Hiregadde	352	1551	24	101
4			Koppa	Kulur	402	1884	455	1874
5			Koppa	Yelemadalu	473	2094	527	2117
6			Koppa	Megur	106	568	104	527
7			Koppa	Jayapur	874	3696	917	3454
8			Koppa	Adigebail	560	2362	509	1943
9			Koppa	Agalagundi	247	1137	234	918
10			Koppa	Hulagaradi	121	562	111	486
11			Koppa	Heggar	172	784	150	641
12			Koppa	Bachal Kan	Na	Na	Na	Na
13			Koppa	Guddetota	264	1137	262	1053
14			Koppa	Honnugundi	289	1333	288	1350
15			Koppa	Bhairadevar	421	1809	439	1617
16			Koppa	Na	Na	Na	82	335
17			Koppa	Harlane	142	706	139	573
18			Koppa	Kallugudda	224	1088	249	1001
19			N.r.pura	Kolhalli	Na	Na	151	681
20			N.r.pura	Maduguni	Na	Na	Na	Na
21			N.r.pura	Megaramakki	155	690	187	710
22			Sringeri	Malnadu	130	731	157	742
23		Udupi	Karkal	Nadpal	509	2578	563	2478
24		Chikmagalur	Sringeri	Rushyashringapura	365	1588	394	1501
25			Sringeri	Yedahalli	240	1162	80	407
26		Shimoga	Thirthahalli	Agumbe	NA	NA	NA	NA

Table 3.3:

Villages within the Least Cost Pathway Corridor between Someshwara WLS-Kudremukh NP-Bhadra WLS as shown in Fig. 3.12

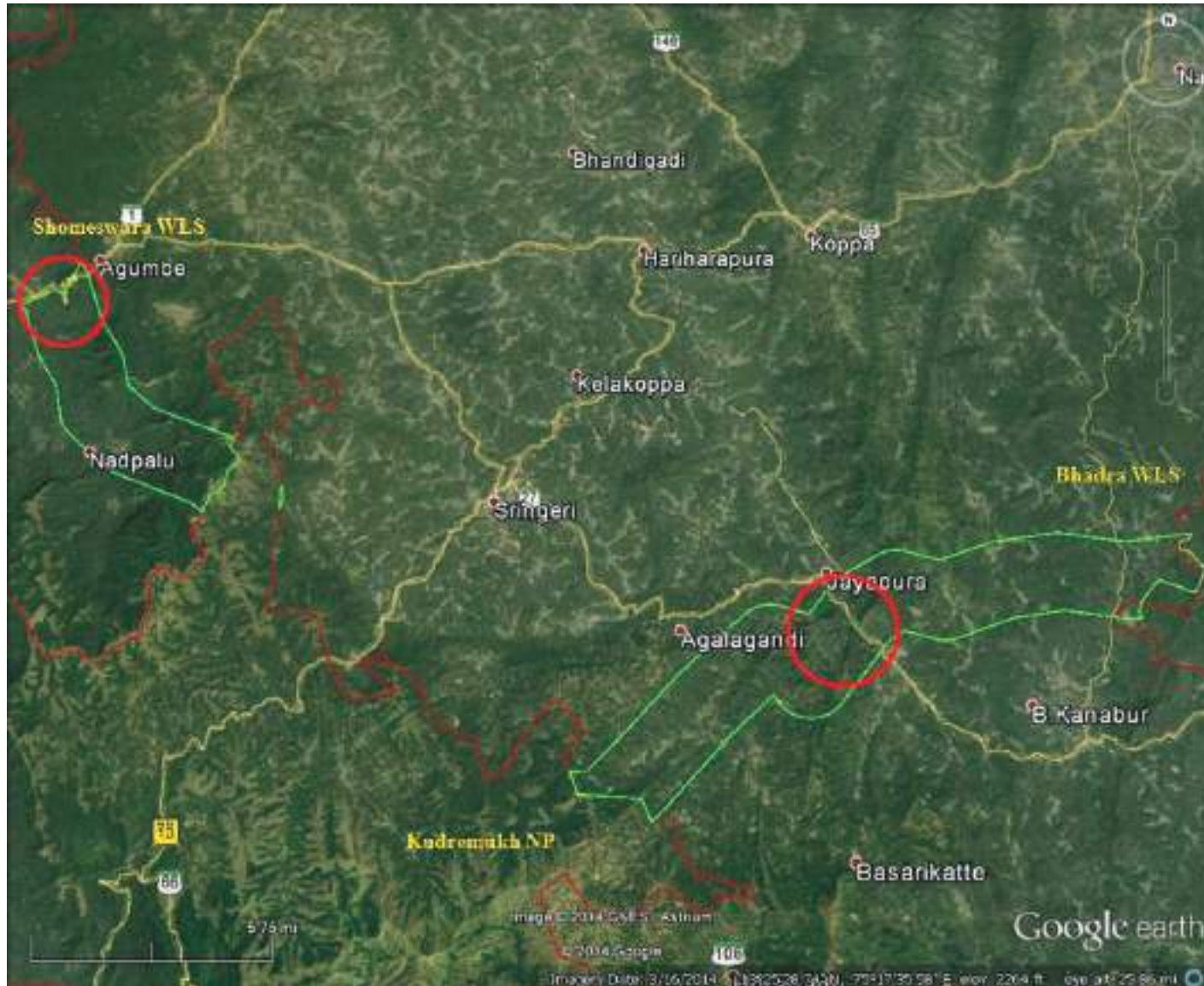
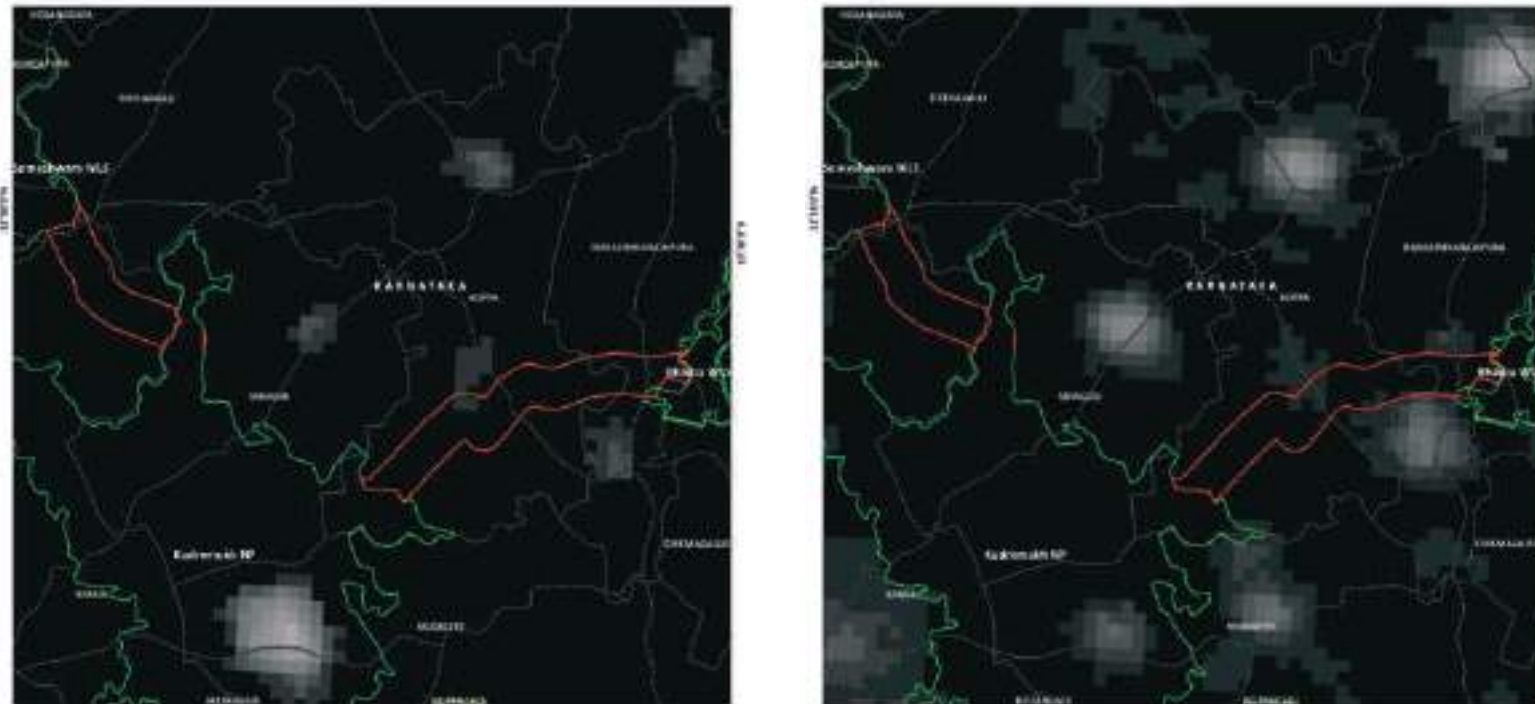


Figure 3.13:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Someshwara WLS- Kudremukh NP-Bhadra WLS

Figure 3.14:

Human habitation as depicted by nightlights within the Someshwara WLS-Kudremukh NP-Bhadra WLS Corridor landscape in the year 1992



Someshwara-Mookambika-Shettihalli WLS corridor

Habitat size	40589 Sq. Km
Source Population	Anshi NP Dandeli WLS
Size of Source	39 (36-42) tigers in 4756 Sq. Km
Protected Areas	Someshwara WLS Mookambika WLS Shettihali WLS
Corridors	Someshwara WLS-Mookambika WLS Mookambika WLS-Shettihali WLS

Mookambika Wildlife Sanctuary is connected to Someshwara Wildlife Sanctuary in the south through Reserved Forests of Hulikal, Varahi and Tombattu; which is further connected to Kudremukh National Park through contiguous forest. On the east, Mookambika Wildlife Sanctuary is poorly connected to Shettihali Wildlife Sanctuary through narrow ridge-top forests, the last part (8-10 km) of which traverses habitation and agriculture, with small patches of forests providing "stepping stone" connectivity.

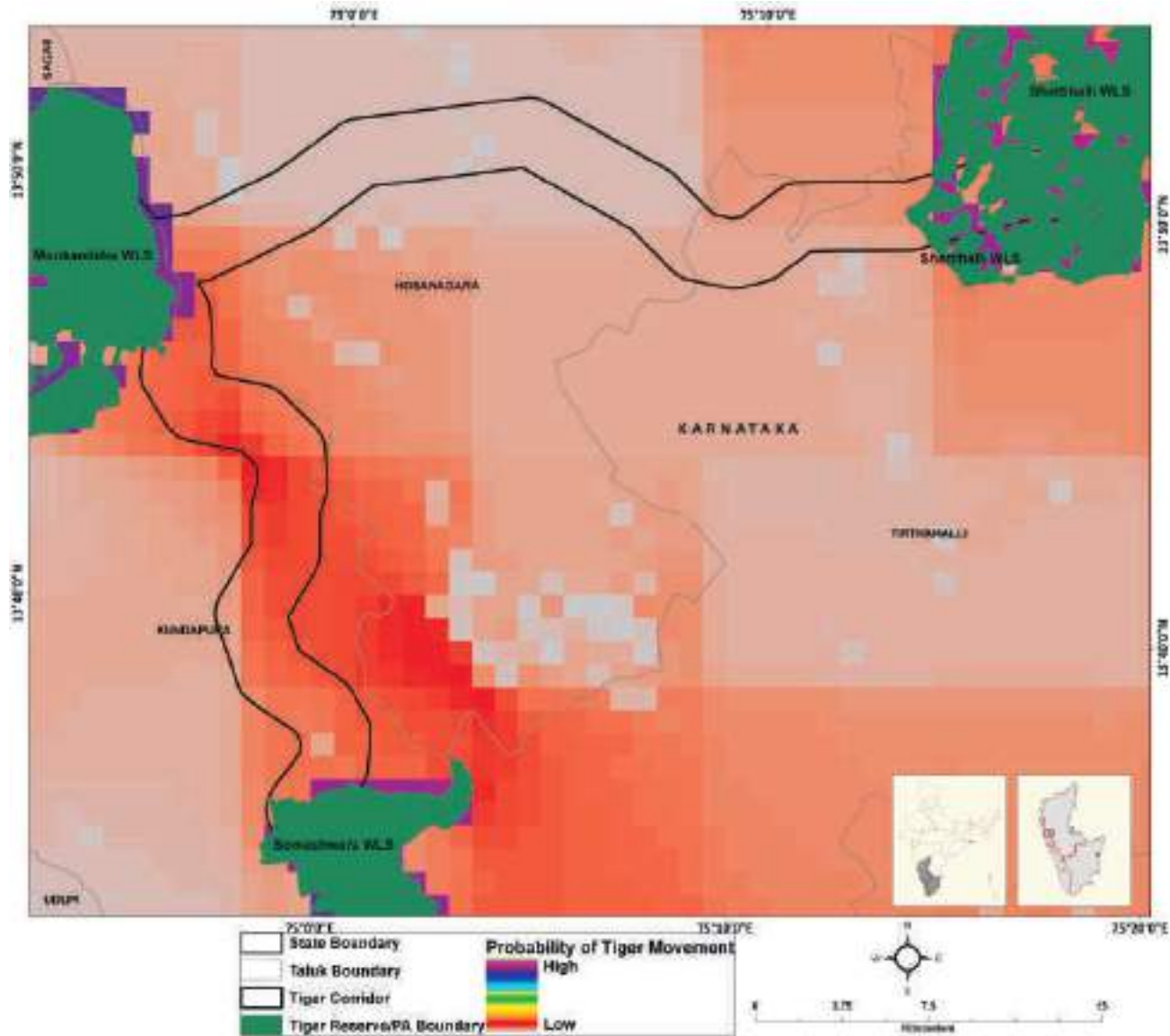
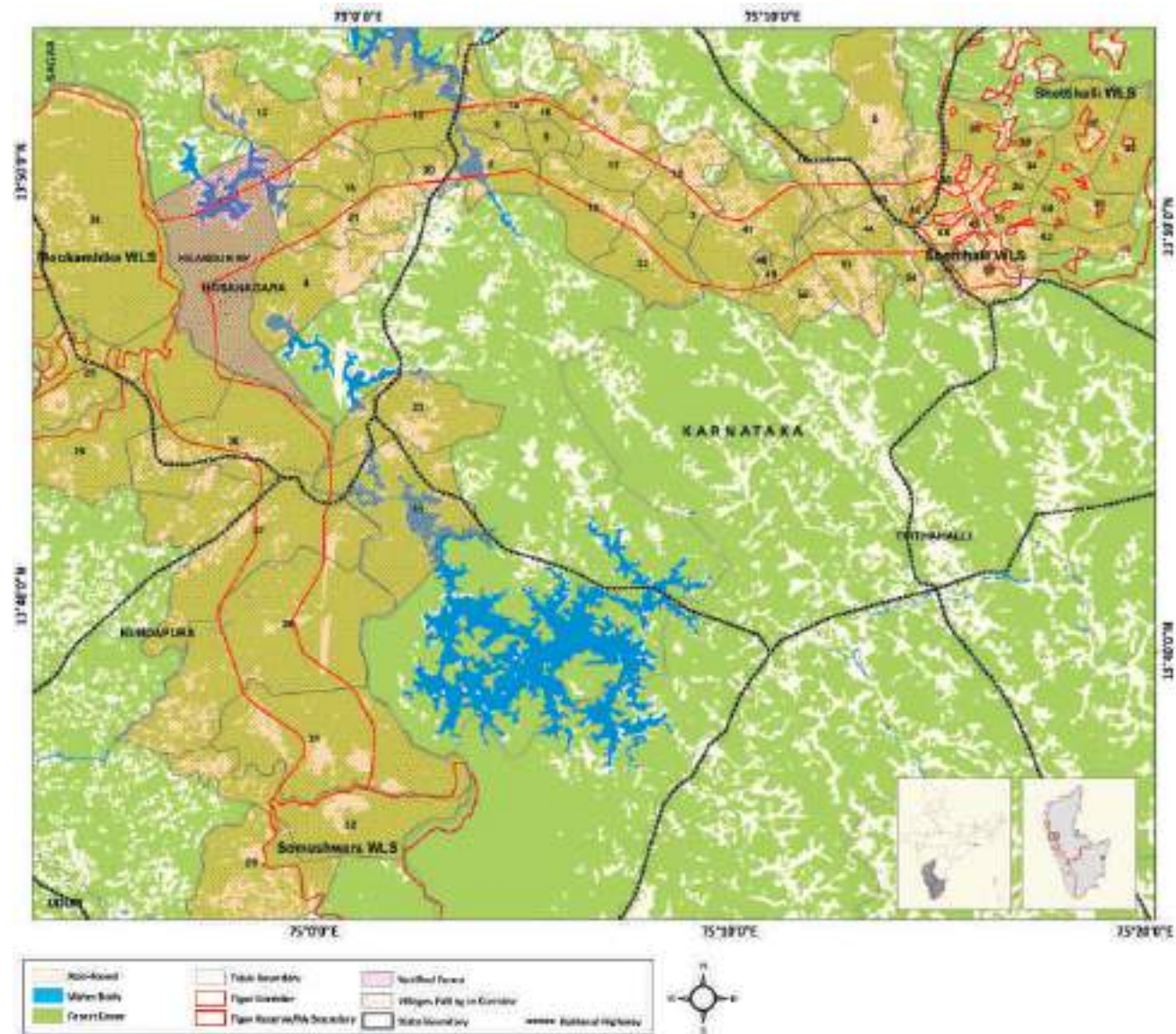


Figure 3.15:
Potential habitat connectivity for tiger movement between Someshwara-Mookambika-Shettihalli WLS corridor as depicted by CIRCUITSCAPE model

Figure 3.16:

Least Cost Pathway corridor for tiger movement between Someshwara-Mookambika-Shettihalli WLS overlaid with village map (the village numbers are referenced in Table 3.4)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Karnataka	Shimoga	Hosanagara	Balekoppa	26	200	43	207
2			Hosanagara	Kodase	52	260	66	255
3			Hosanagara	Billodi	89	384	96	438
4			Hosanagara	Malali	55	288	59	353
5			Hosanagara	Malalikoppa	83	436	96	446
6			Hosanagara	Gorgodu	161	858	204	954
7			Hosanagara	Aramanekoppa	218	1023	234	958
8			Hosanagara	Haniya	76	370	80	320
9			Hosanagara	Nellunde	40	199	50	197
10			Hosanagara	Sonale	229	1154	248	1134
11			Hosanagara	Nidagodu	154	692	266	1043
12			Hosanagara	Mattikai	166	753	193	766
13			Hosanagara	Brahmanataruve	85	384	102	369
14			Hosanagara	Kukkodagasaramane	112	488	140	501
15			Hosanagara	Ramachandrapur	117	617	38	121
16			Hosanagara	Honnebailu	211	1034	228	883
17			Hosanagara	Trineve	188	924	202	916
18			Hosanagara	Brahmanvad	95	443	114	494
19			Hosanagara	Togare	142	705	152	637
20			Hosanagara	Basavanbyana	49	245	55	262
21			Hosanagara	Baise	183	886	208	961
22			Hosanagara	Kalluvidiabbigalla	97	462	114	417
23			Hosanagara	Kairakunda	732	3001	475	1704
24		Udupi	Kundapura	Muduru	660	3033	694	2973
25			Kundapura	Halihole	443	2460	495	2328
26			Kundapura	Bellal	499	2728	552	2780
27			Kundapura	Hosangadi	1040	4972	1131	4872
28			Kundapura	Machattu	456	2722	532	2616
29			Kundapura	Shedimane	413	2023	492	2370
30			Kundapura	Yedamoge	NA	NA	NA	NA

Table 3.4:

Villages within the Least Cost Pathway Corridor between Someshwara-Mookambika-Shettihalli WLS as shown in Fig. 3.16

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			Kundapura	Amasebail	524	2654	614	3034
32			Kundapura	Samshe	NA	NA	NA	NA
33		Shimoga	Thirthahalli	Vatigar	55	263	60	255
34			Thirthahalli	Hire Kallahalli	29	163	33	142
35			Thirthahalli	Torebail	87	411	108	459
36			Thirthahalli	Chik Kallahalli	54	348	73	315
37			Thirthahalli	Alur	99	499	3	13
38			Thirthahalli	Kesare	123	497	109	417
39			Thirthahalli	Umblebailu	8	37	9	38
40			Thirthahalli	Muniyur	277	1273	308	1414
41			Thirthahalli	Shankarapura	245	1168	19	72
42			Thirthahalli	Mandaka	18	62	18	62
43			Thirthahalli	Shankarahalli	36	207	41	209
44			Thirthahalli	Hosakoppa	39	210	14	66
45			Thirthahalli	Karekoppa	6	25	221	947
46			Thirthahalli	Hadigallu	179	839	271	1078
47			Thirthahalli	Halavanahalli	60	274	63	237
48			Thirthahalli	Balagodu	26	100	32	108
49			Thirthahalli	Aralasurali	109	508	130	460
50			Thirthahalli	Bidi	15	78	1025	4445
51			Thirthahalli	Melina Kadkod	36	181	41	178
52			Thirthahalli	Demalapura	158	688	188	767
53			Thirthahalli	Malleswara	188	935	351	1498
54			Thirthahalli	Kardiga	135	670	178	727
55			Thirthahalli	Konanduru	883	4009	996	3973
56			Thirthahalli	Siragaru	274	1217	296	1210

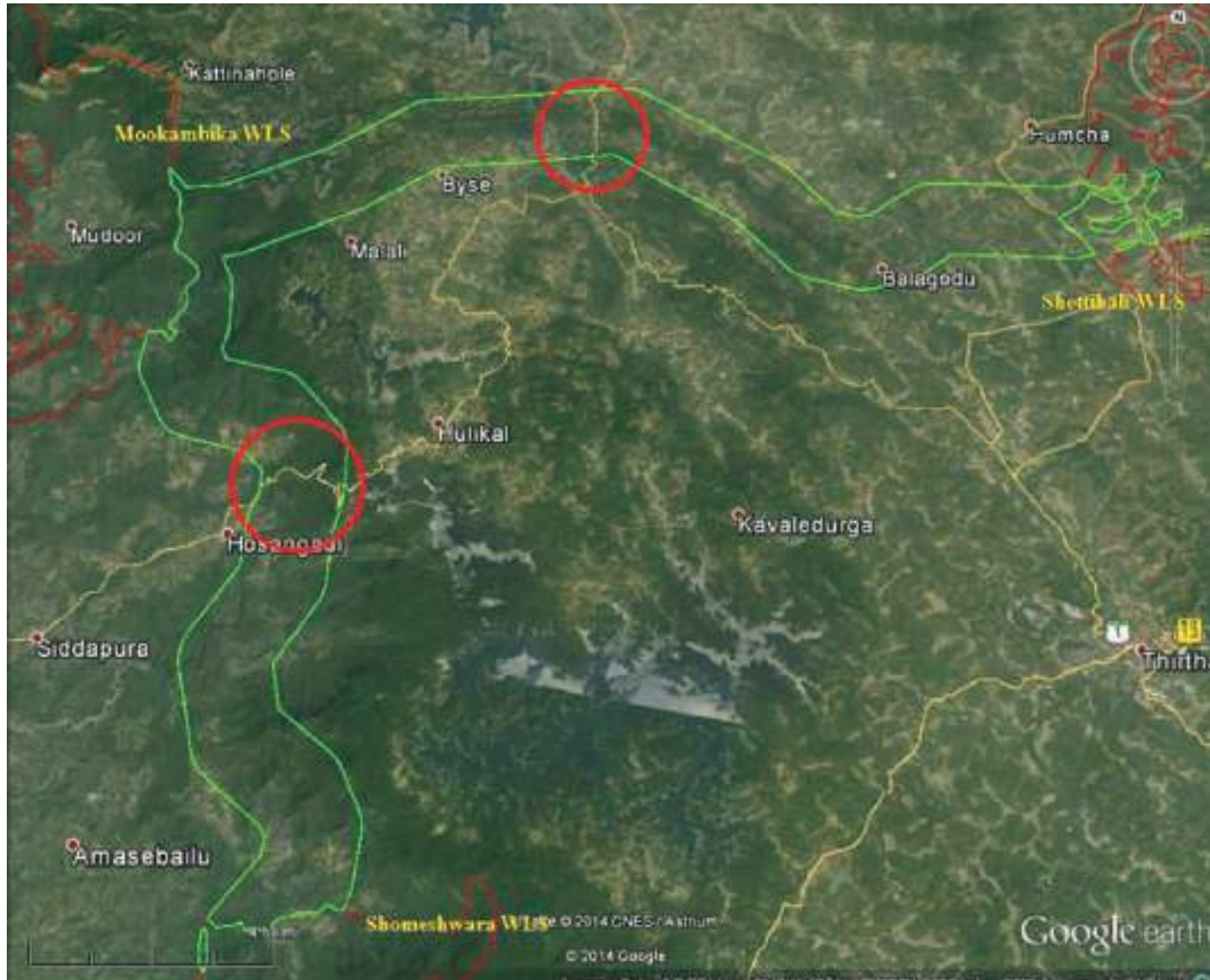
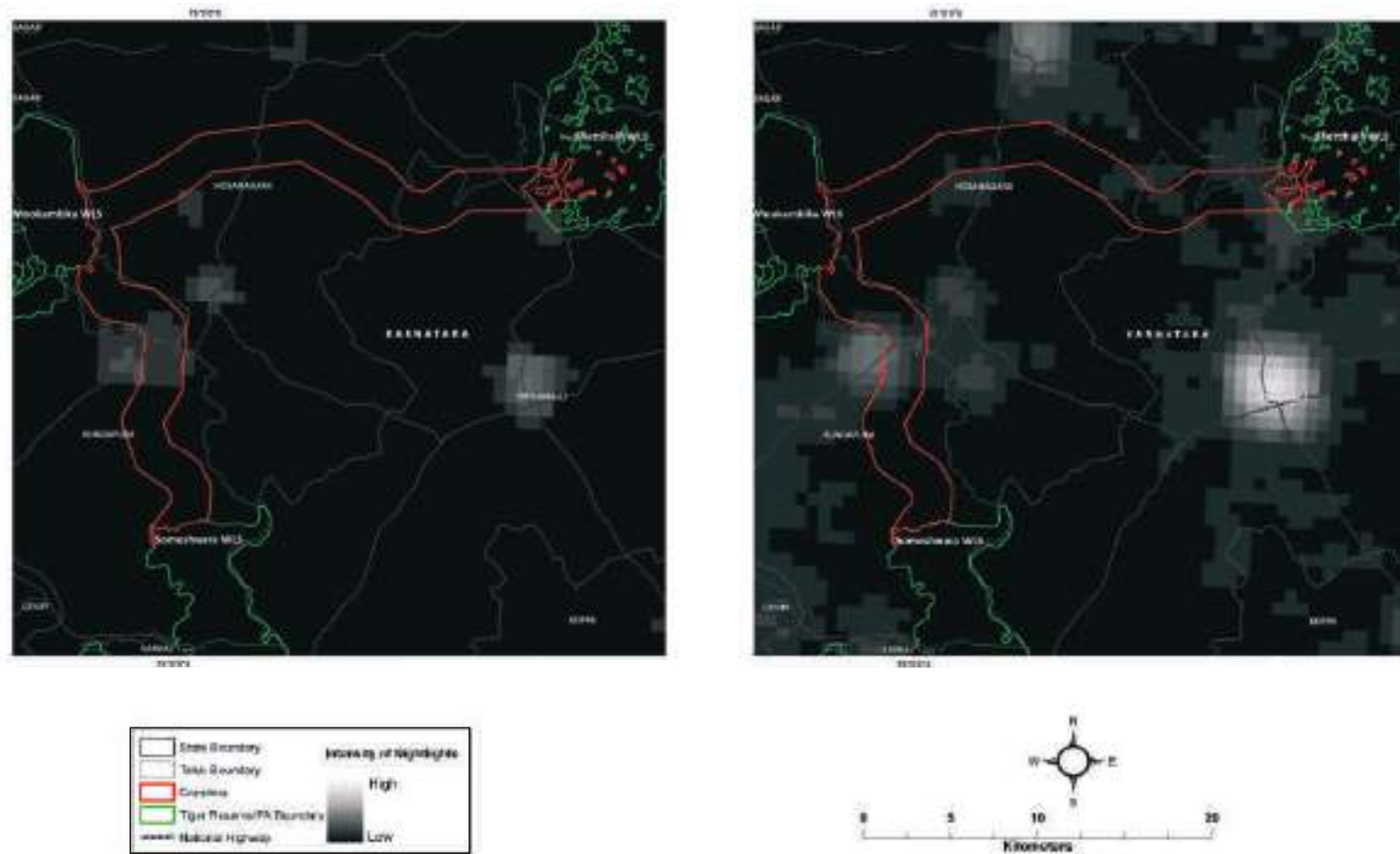


Figure 3.17:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Someshwara-Mookambika-Shettihalli WLS

Figure 3.18:

Human habitation as depicted by nightlights within the Someshwara-Mookambika-Shettihalli WLS Corridor landscape in the year 1992



The Reserved Forests of Northern Cardamom Hills, Choranyedahalli, Kakanhosudi and Tamadihalli connect Shettihalli Wildlife Sanctuary to the northern parts of Bhadra Tiger Reserve. While this habitat matrix is permeable for wildlife movement, it is dotted with few agricultural developments which could grow into barriers at a later date. Connectivity to the southern portion of Bhadra with Shettihalli was only through ridge top forests and at risk of being broken at some places by agriculture development. Habitat matrix intervening Bhadra Tiger Reserve and Kudremukh National Park was conducive for movement of tigers and their prey, but designating a formal corridor within this matrix would ensure this connectivity for the future.

Bhadra-Shettihalli WLS Corridor

Habitat size	40589 Km ²
Source Population	Kudremukh-Bhadra
Size of Source	40 (38-42) tigers in 4258 Km ²
Protected Areas	Bhadra WLS Shettihalli WLS
Corridors	Shettihalli WLS-Bhadra WLS 1 Shettihalli WLS-Bhadra WLS 2

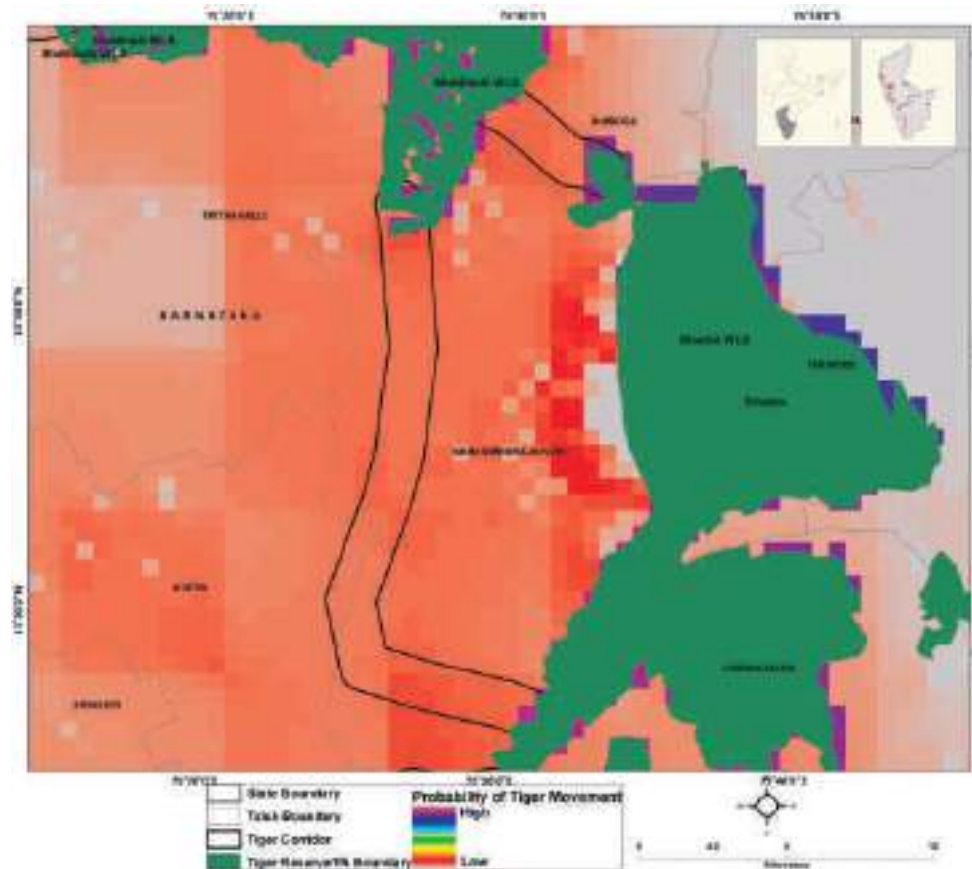
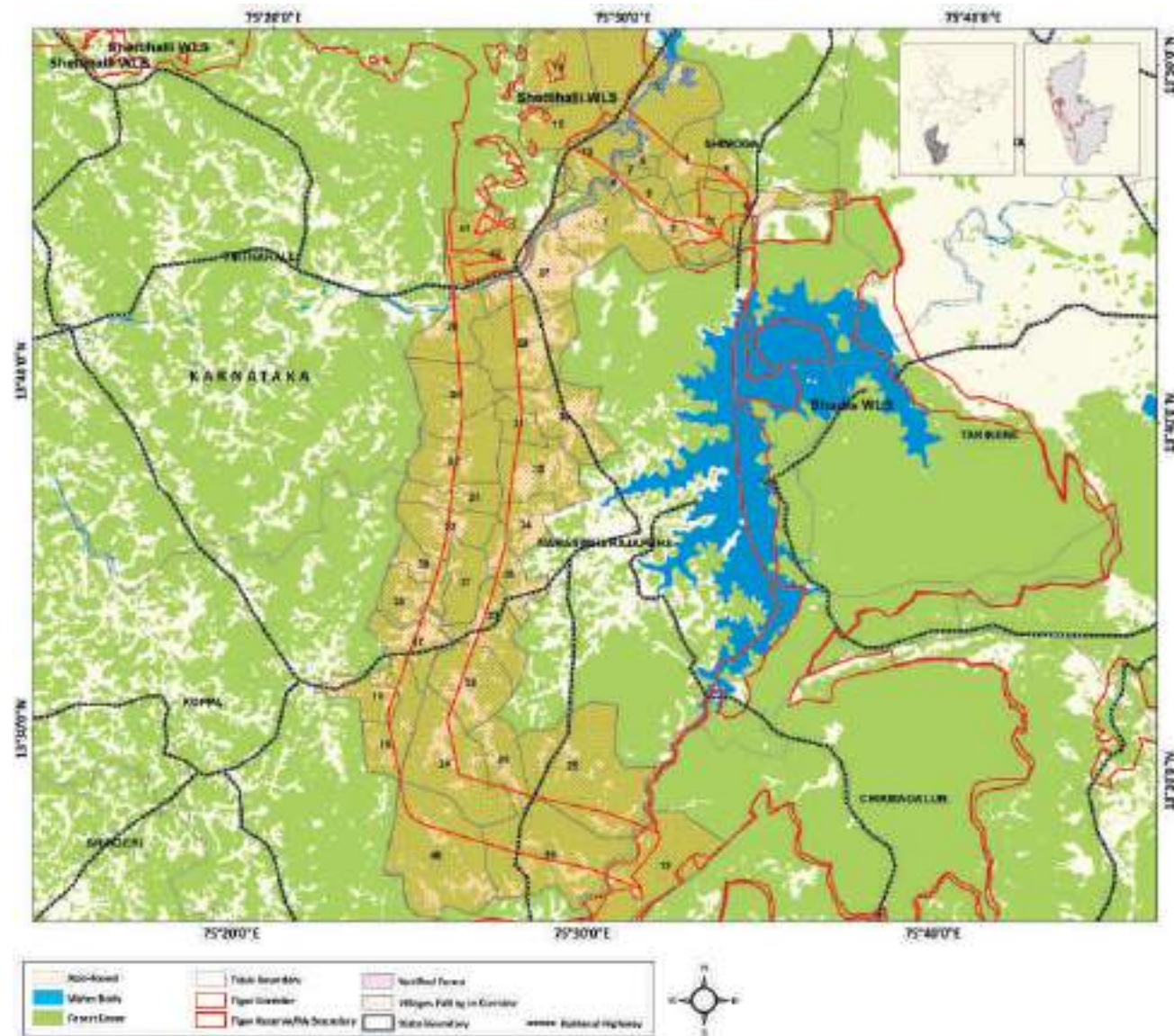


Figure 3.19:
Potential habitat connectivity for tiger movement between Bhadra-Shettihalli WLS Corridor as depicted by CIRCUITSCAPE model

Figure 3.20:

Least Cost Pathway corridor for tiger movement between Bhadra-Shettihalli WLS overlaid with village map (the village numbers are referenced in Table 3.5)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Karnataka	Chikmagalur	N.R.Pura	Kanaburu	NA	NA	NA	NA
2		Shimoga	Shimoga	Lingapura	2	8	174	895
3			Shimoga	Sakrebailu	6	32	11	49
4			Shimoga	Kaitotlu	64	316	55	241
5			Shimoga	Sarigere	29	139	30	123
6			Shimoga	Chitemane	NA	NA	NA	NA
7			Shimoga	Naldlle	NA	NA	NA	NA
8			Shimoga	Biligalu	340	1681	190	852
9			Shimoga	Siddammaji Hosuru	40	160	40	162
10			Shimoga	Bairapura	Na	Na	47	196
11			Shimoga	Kakanhosudi	95	440	105	392
12			Thirthahalli	Talale	57	262	201	929
13			Thirthahalli	Bommanahalli	5	21	253	1372
14			Thirthahalli	Kigadi	86	357	84	312
15		Chikmagalur	Chikmagalur	Shirgota	166	705	140	504
16			Koppa	Nuggi	444	1980	449	1693
17			Koppa	Talamakki	332	1609	442	1703
18			Koppa	Bintaravalli	477	2256	721	3029
19			N.R.Pura	Adavalli	Na	Na	75	314
20			Narasimharajapura	Konakere	103	558	127	502
21			Narasimharajapura	Bellur	87	372	151	615
22			Narasimharajapura	Konodi	161	742	176	679
23			Narasimharajapura	Sankse	205	892	211	855
24			Narasimharajapura	Haravari	371	1588	413	1590
25			Narasimharajapura	Alehalli	156	618	149	536
26			Narasimharajapura	Davana	119	552	140	512
27			N.R.Pura	Muttinakoppa	NA	NA	NA	NA
28			N.R.Pura	Madaburu	NA	NA	NA	NA
29			N.R.Pura	Malandur	NA	NA	NA	NA
30			N.R.pura	Kadabinabail	NA	NA	NA	NA

Table 3.5:

Villages within the Least Cost Pathway Corridor between Bhadra-Shettihalli WLS as shown in Fig. 3.20

Village ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31			N.R.Pura	Neralakoppa	NA	NA	8	41
32			N.R.Pura	Hatur	NA	NA	NA	NA
33			N.R.Pura	Badagabail	NA	NA	NA	NA
34			N.R.Pura	Simmase	NA	NA	NA	NA
35			N.R.Pura	Gubbage	NA	NA	NA	NA
36			N.R.Pura	Kamalapur	NA	NA	NA	NA
37			N.R.Pura	Sedgaru	NA	NA	65	274
38			N.R.Pura	Situr	NA	NA	NA	NA
39			N.R.Pura	Kanuru	NA	NA	250	1048
40			N.R.Pura	Karkeshvar	NA	NA	NA	NA
41		Shimoga	Thirthahalli	Hemmakki	87	403	407	1707
42		Shimoga	Thirthahalli	Lingapur	437	2028	191	1002



Figure 3 21:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Bhadra-Shettihalli WLS

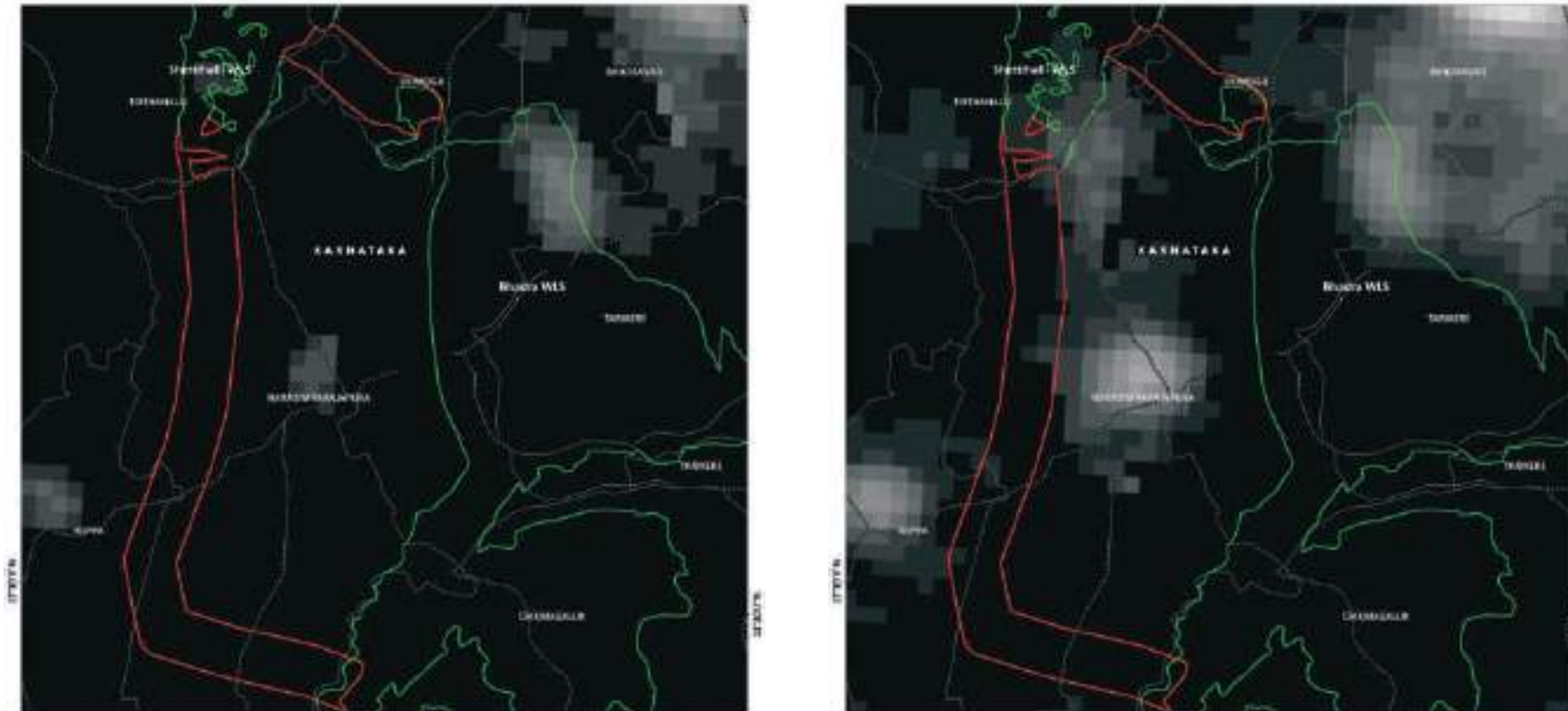
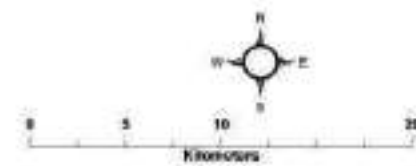


Figure 3.22:
Human habitation as depicted by nightlights within the Bhadra-Shettihalli WLS landscape in the year 1992 and 2012



The connectivity to the south from Kudremukh National Park to Pushpagiri Wildlife Sanctuary, and then directly onto Nagarahole National Park and to Wayanad Tiger Reserve (Kerala) via Talakaveri Wildlife Sanctuary and Brahmagiri Wildlife Sanctuary is one of the most precarious corridor systems within the Western Ghats. The connectivity of Kudremukh-Bhadra complex to the Nagarahole-Bandipur-Mudumalai-Wayanad complex via the western corridor system (Pushpagiri-Talakaveri-Brahmagiri) as well as the direct connectivity to Nagarahole showed tiger presence suggestive of viable corridors systems. The western corridor is along the steep western slopes of the Ghats and therefore not an easy passage for species like elephants, while the eastern corridor is along moderate gradients but traverses more human impacted habitats. There are two bottlenecks on the eastern corridor; one along the banks of the Cauvery where agricultural development disrupts forest contiguity and another is near Nagarahole, where the corridor passes through an agriculture-forest matrix for the last 8-10 kilometres. Movement of tigers from the Nagarahole-Mudumalai-Wayanad landscape to Kudremukh-Bhadra complex is likely to be an important component for tiger population dynamics in this low density landscape. Formal recognition and protection of these least cost pathways as corridors would help ensure long term tiger persistence within this landscape system.

Wayanad Wildlife Sanctuary shares its north-eastern border with Karnataka and is contiguous with parts of Bandipur and Nagarahole in Karnataka and Mudumalai in Tamil Nadu. The Tholpetty Range of Wayanad in Manantoddy taluka is contiguous with Nagarahole while Kurichiat, Sultan's Battery and Muthanga Ranges are contiguous with Bandipur and Mudumalai Tiger Reserve. This landscape (Nagarahole-Wayanad-Mudumalai) hosts the largest contiguous population of tigers and elephants. Wayanad is connected to the Silent Valley National Park in Kerala through Mudumalai and Mukurti in Tamil Nadu.

Nagarahole-Pushpagiri-Talakavery Corridor

Habitat size	40589 Km ²
Source Population	Bandipur-Nagarahole-Mudumalai-Wayanad
Size of Source	382 (354-411) tigers in 11100 Km ²
Protected Areas	Nagarahole WLS Pushpagiri WLS Talacaavery WLS
Corridors	Nagarahole WLS-Pushpagiri WLS Pushpagiri WLS-Talacaavery WLS

Wayanad-Brahmagiri-Talakaveri WLS

Habitat size	40589 Km ²
Source Population	Bandipur-Nagarahole-Mudumalai-Wayanad
Size of Source	382 (354-411) tigers in 11100 Km ²
Protected Areas	Wayanad WLS Brahmagiri WLS Talacaavery WLS
Corridors	Wayanad WLS-Brahmagiri WLS Brahmagiri WLS-Talacaavery WLS



Figure 3.23

Potential habitat connectivity for tiger movement between Nagarahole-Pushpagiri-Talakaveri-Brahmagiri Corridor as depicted by CIRCUITSCAPE model

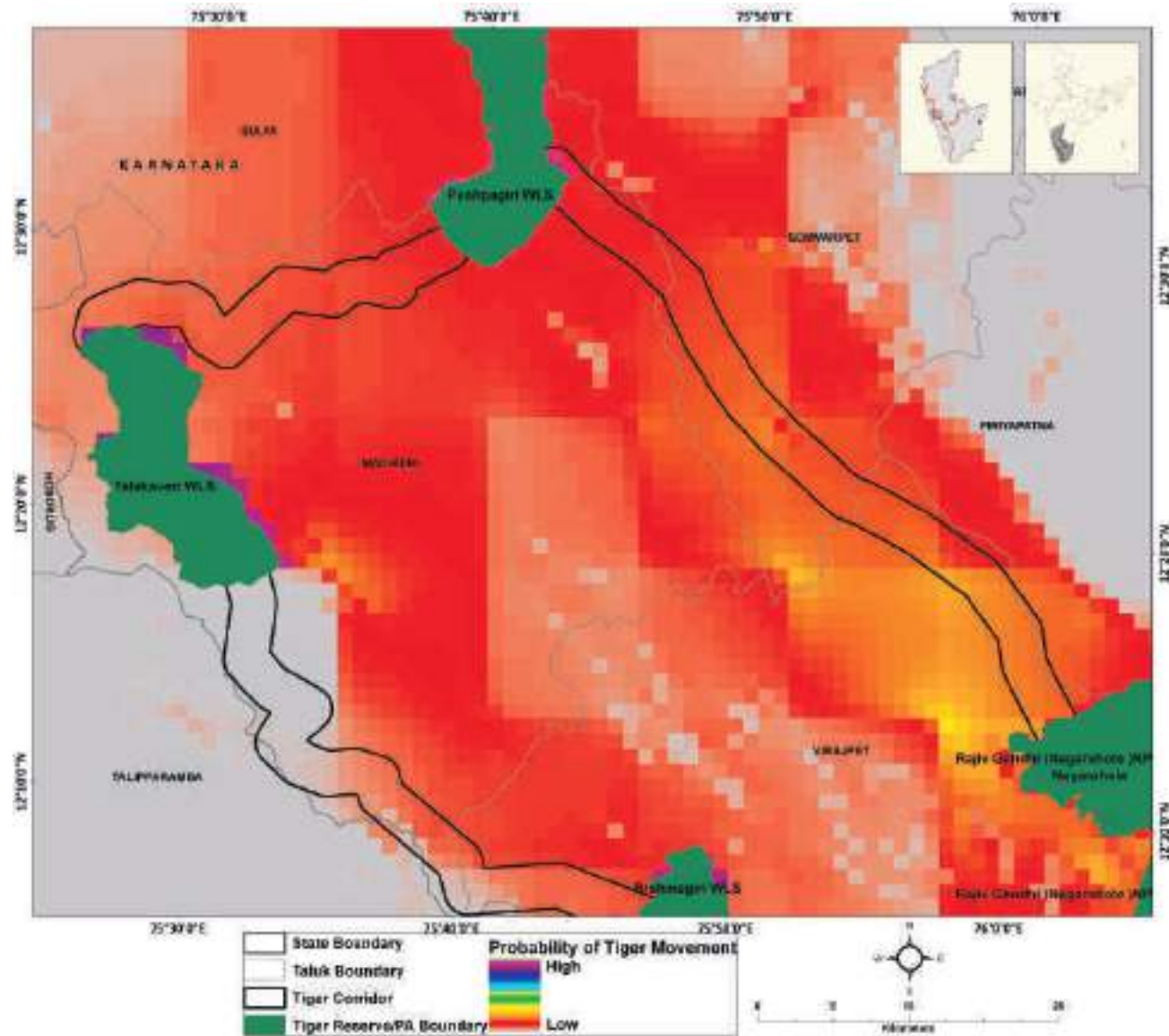




Figure 3.24:
Least Cost Pathway
corridor for tiger
movement between
Nagarahole-Pushpagiri-
Talakaveri

Figure 3.25:

Least Cost Pathway corridor for tiger movement between Wayanad-Brahmagiri-Talakaveri WLS



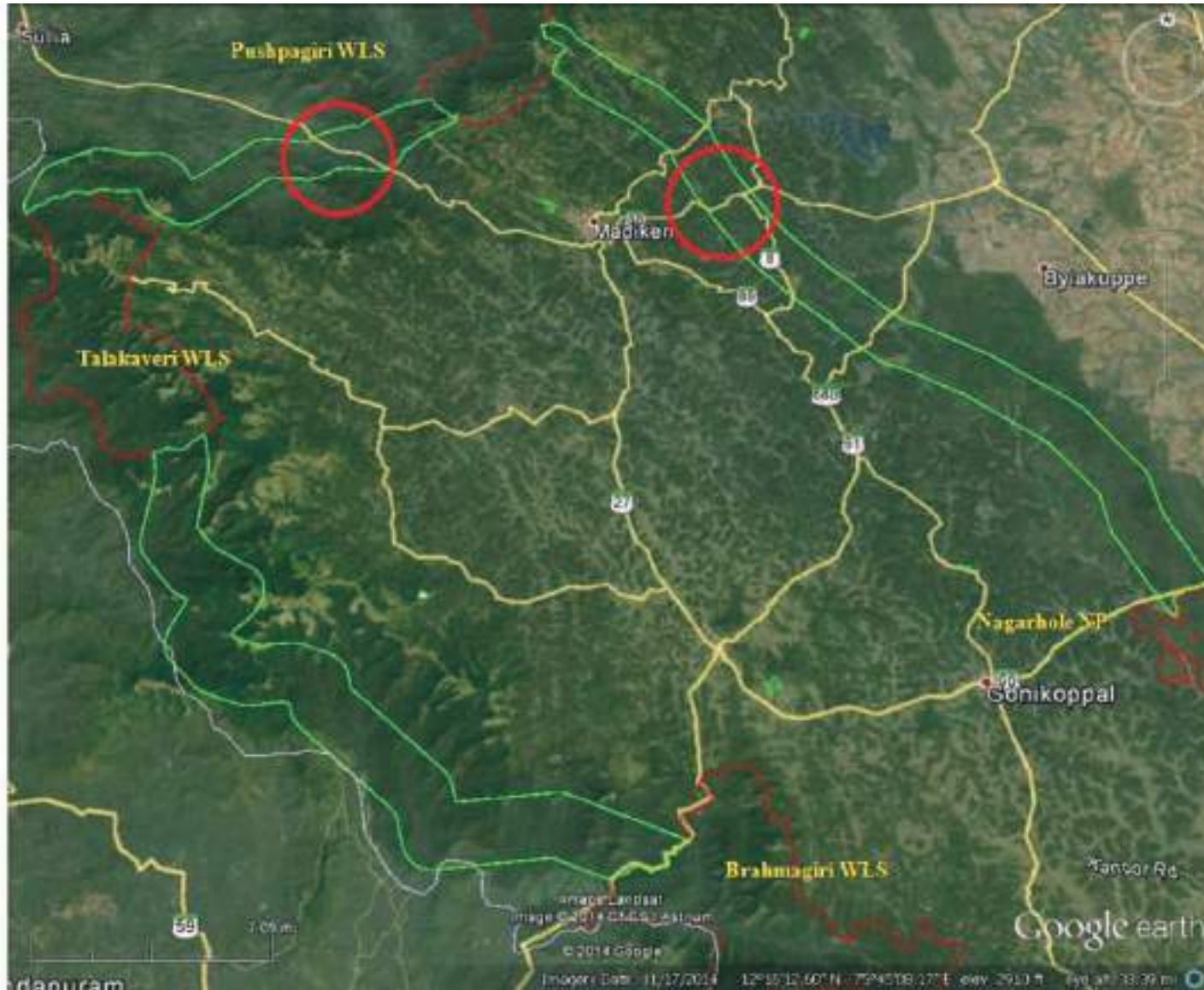


Figure 3.26:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Nagarhole-Pushpagiri-Talakaveri-Brahmagiri

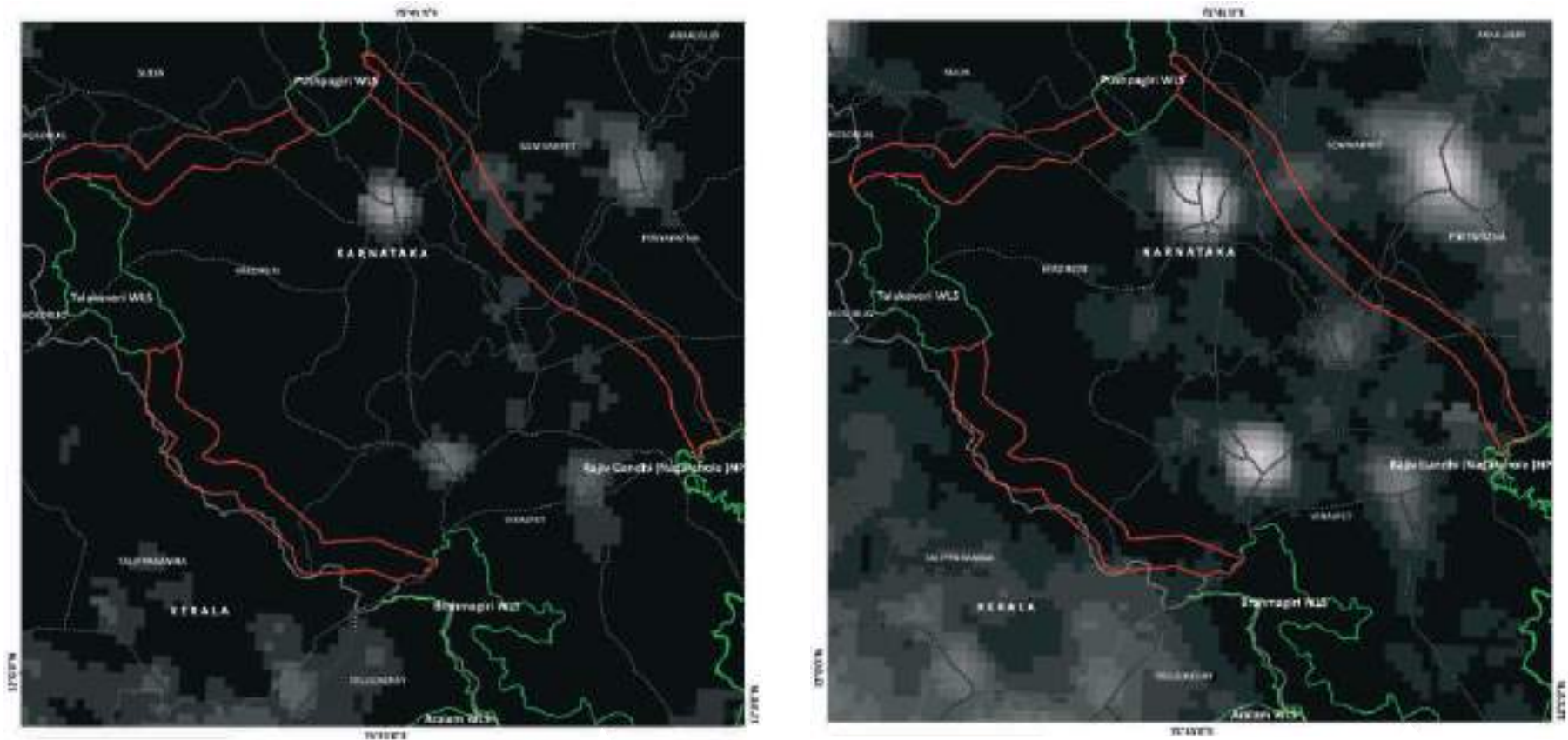


Figure 3.27:

Human habitation as depicted by nightlights within the Nagarhole-Pushpagiri-Talakaveri-Brahmagiri landscape in the year 1992 and 2012

NAGARAHOLE-BANDIPUR-MUDUMALAI-WAYANAD

This landscape has the highest tiger population in India within a network of Protected Areas. This landscape encompasses Wayanad in Kerala, Nagarahole-Bandipur in Karnataka along the northern border with Mudumalai in Tamil Nadu and BRT and Cauvery Wildlife Sanctuary along Karnataka-Tamil Nadu border. This contiguous tiger population stretches across three states, viz., Karnataka (Nagarahole-Bandipur), Tamil Nadu (Mudumalai-Segur plateau-Moyar gorge-Sathyamangalam) and Kerala (Wayanad). In 2010-11, tigers were also camera-trapped in the Segur plateau-Moyar gorge-Sathyamangalam region in Tamil Nadu, providing evidence of resident tiger population as well as possible movement of individuals between this region and BRT Wildlife Sanctuary and onwards to Cauvery Wildlife Sanctuary.

Connectivity between Bandipur, BRT and on to Cauvery Wildlife Sanctuary through the Moyar-Segur-Sathyamangalam forests (Tamil Nadu) shown by the Least Cost Pathways needs to be ensured through inter-state cooperation between Karnataka and Tamil Nadu. Connectivity from BRT to Cauvery Wildlife Sanctuary, though intact, is threatened by growing settlements and agriculture, while connectivity from Cauvery to Bannerghatta Wildlife Sanctuary is through narrow forest strips and "stepping stone" forest patches, in a human-dominated landscape.

Bandipur-Cauveri Corridor

Habitat size	40589 Km ²
Source Population	Bandipur-Nagarahole-Mudumalai-Wayanad
Size of Source	382 (354-411) tigers in 11100 Km ²
Protected Areas	Bandipur NP Billigiri Ranganathaswamy WLS Cauvery WLS
Corridors	Bandipur NP-Biligiri Rangaswamy WLS Corridor Bandipur NP-Cauvery WLS Corridor

Cauveri-Bannerghata Corridor

Habitat size	40774 Km ²
Source Population	Bandipur-Nagarahole-Mudumalai-Wayanad
Size of Source	382 (354-411) tigers in 11100 Km ²
Protected Areas	Cauvery WLS Banerghatta WLS
Corridors	Cauvery WLS-Banerghatta WLS Corridor

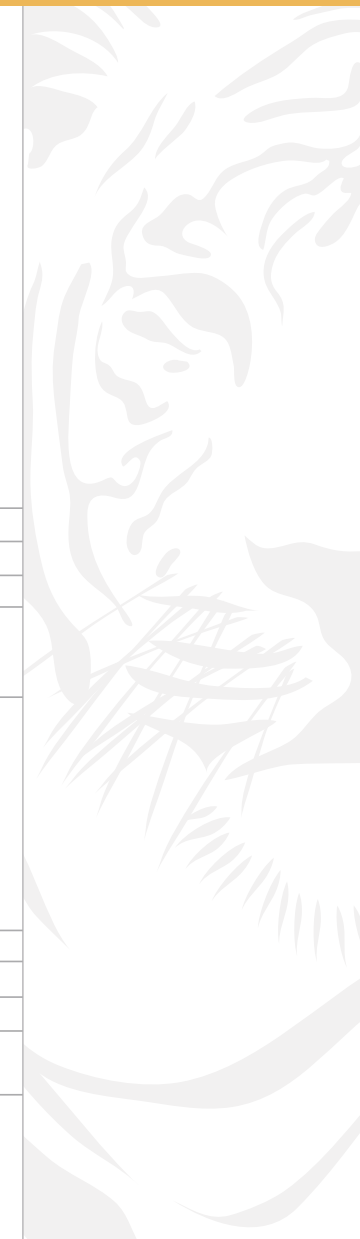
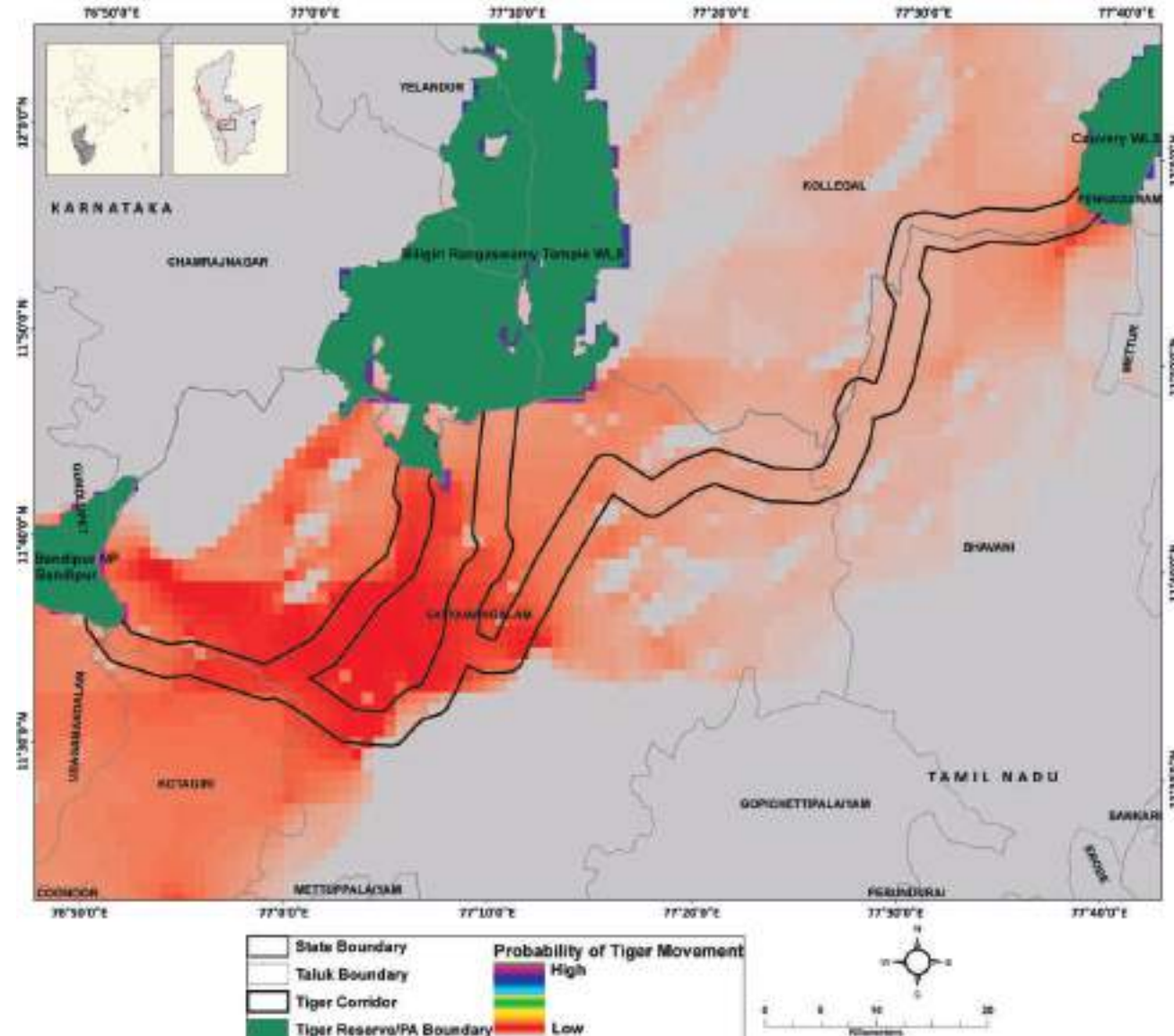


Figure 3.28:

Potential habitat connectivity for tiger movement between Bandipur-Cauveri Corridor as depicted by CIRCUITSCAPE model



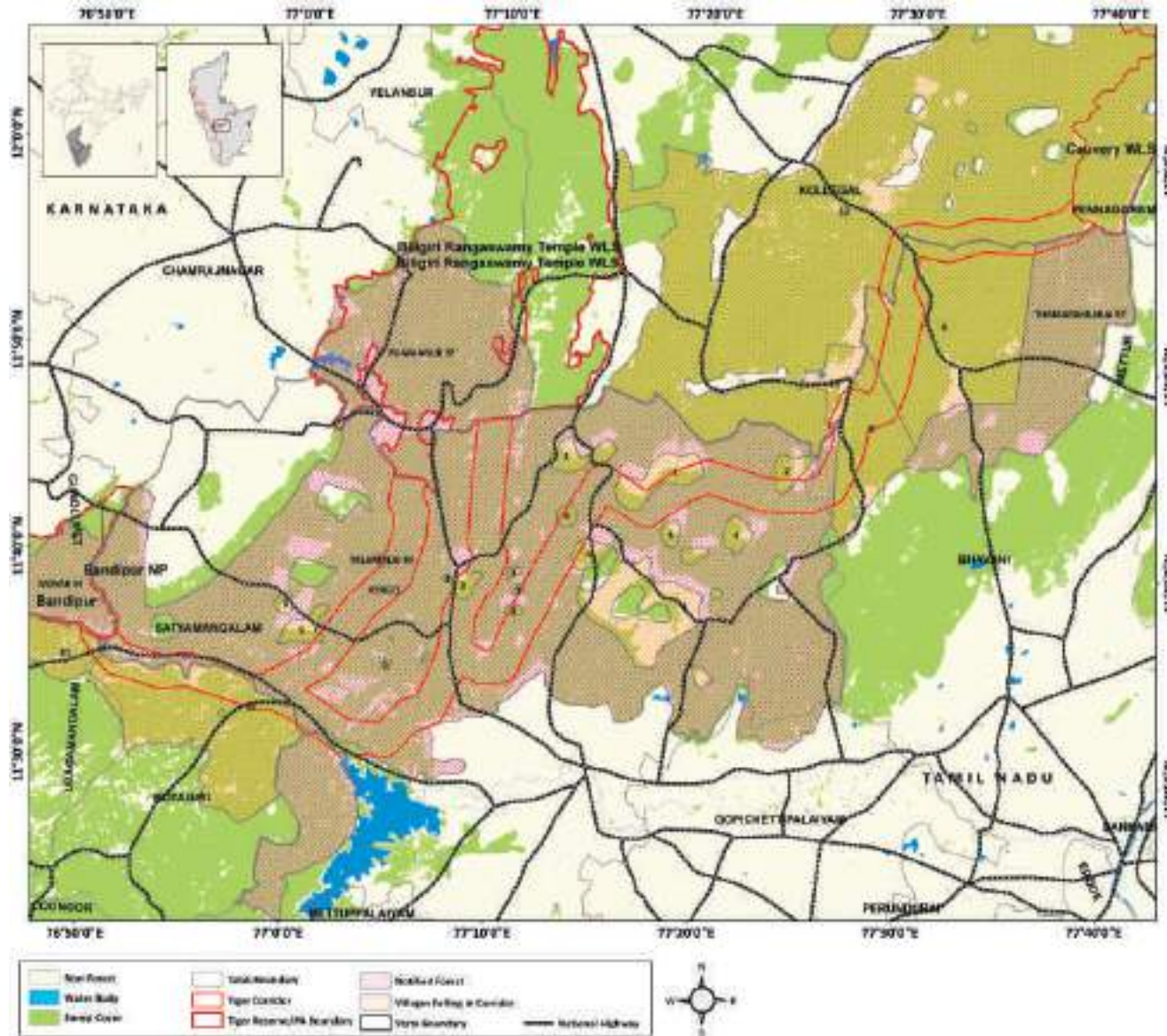


Figure 3.29: Least Cost Pathway corridor for tiger movement between Bandipur-Cauvery WLS overlaid with village map (the village numbers are referenced in Table 3.6)

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Tamil Nadu	Erode	Sathyamangalam	Thingalur A/b	NA	NA	NA	NA
2			Sathyamangalam	Koothampalayam	355	1457	454	1918
3			Sathyamangalam	Hassanur	953	3690	1258	4454
4			Sathyamangalam	Guthiyalathur	3667	14213	4761	17257
5			Sathyamangalam	Talamalai	919	3659	1295	4828
6			Sathyamangalam	Guthiyalathur (addition)	NA	NA	NA	NA
8			Bhavani	Burgur	3651	15874	4128	17529
9			Bhavani	Burgur	3651	15874	4128	17529
10		The Nilgiris	Udhagamandalam	Kadanad	1788	7157	3461	14692
11			Kotagiri	Nilgiri Eastern Slopes	476	1369	NA	NA
12	Karnataka	Chamaraja Nagar	Kollegal	NA	NA	NA	82	335
13			Kollegal	Huggiyam	NA	NA	NA	NA

Table 3.6:

Villages within the Least Cost Pathway Corridor between Bandipur-Cauveri WLS as shown in Fig. 3.29

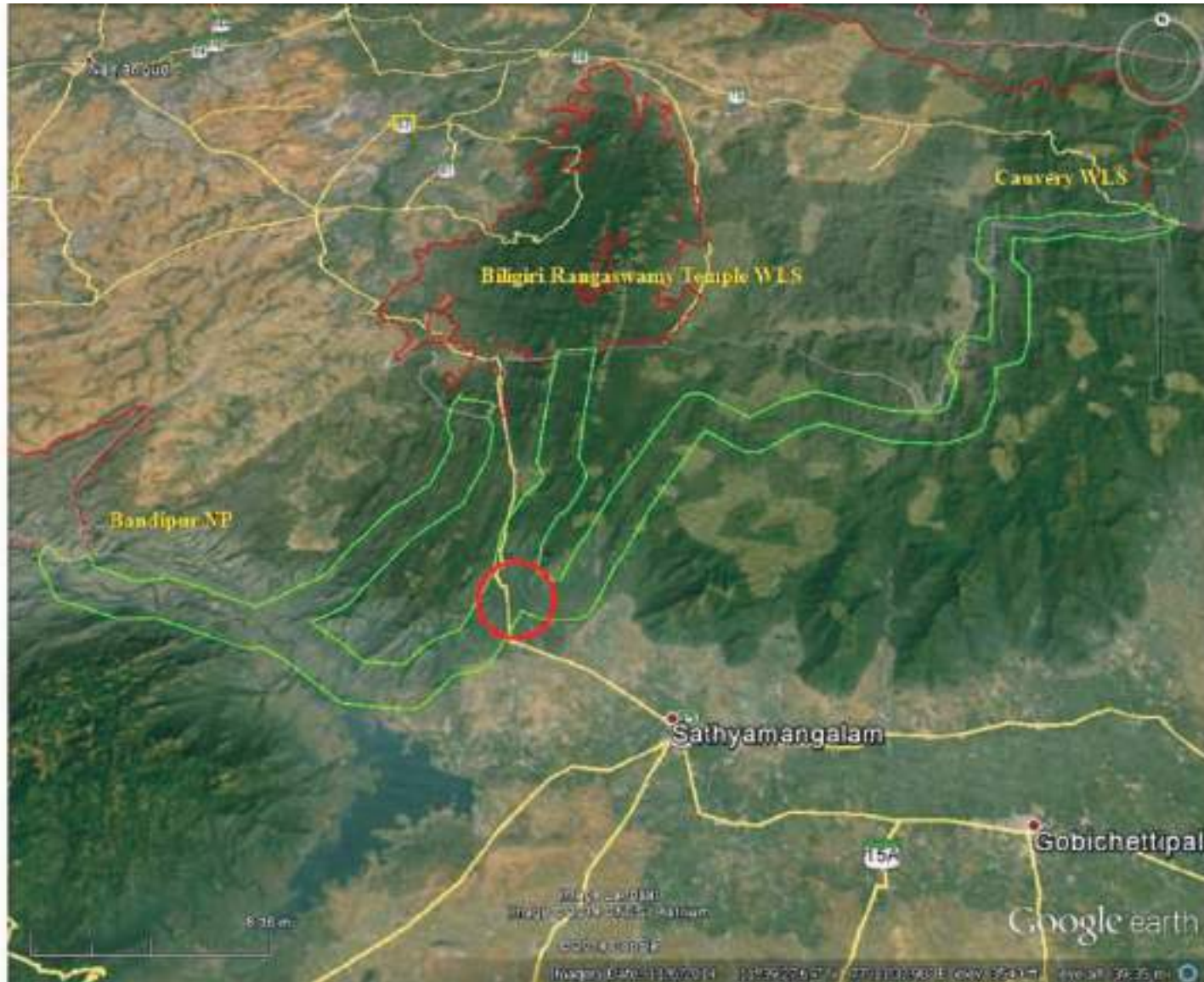


Figure 3.30:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Bandipur-Cauveri

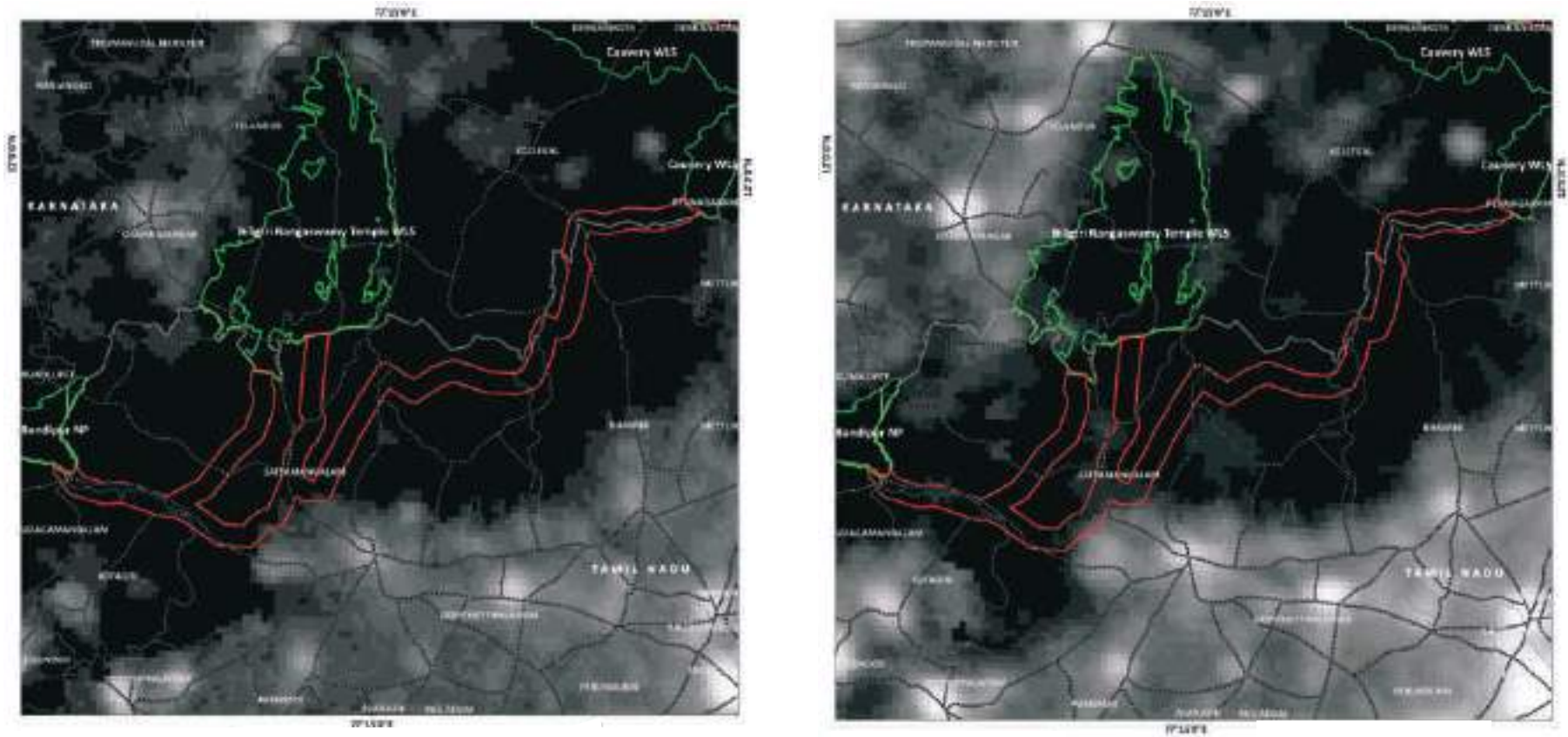
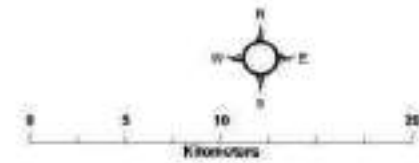


Figure 3.31:
 Human habitation as depicted by nightlights within the Bandipur-Cauveri landscape in the year 1992 and 2012



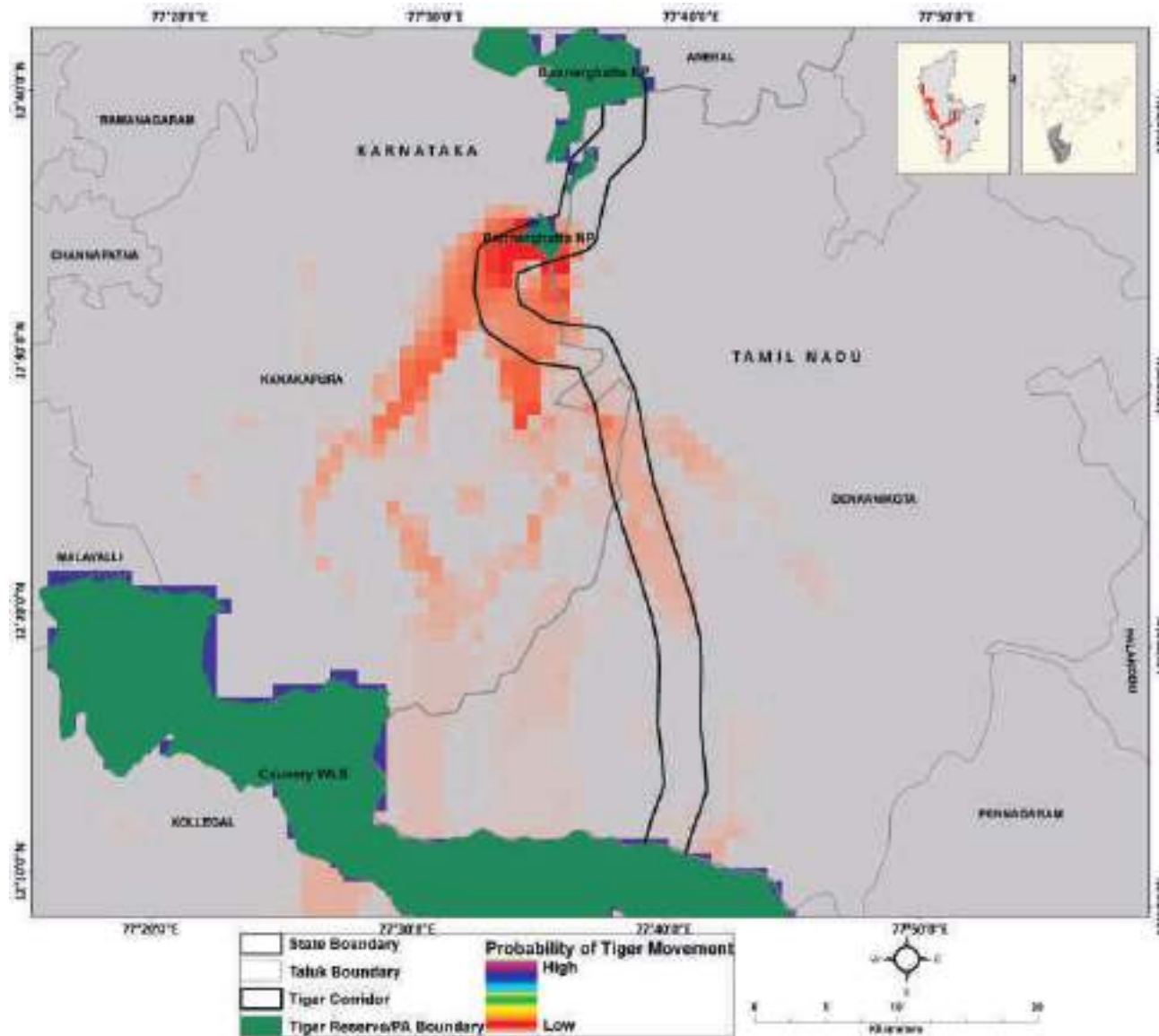
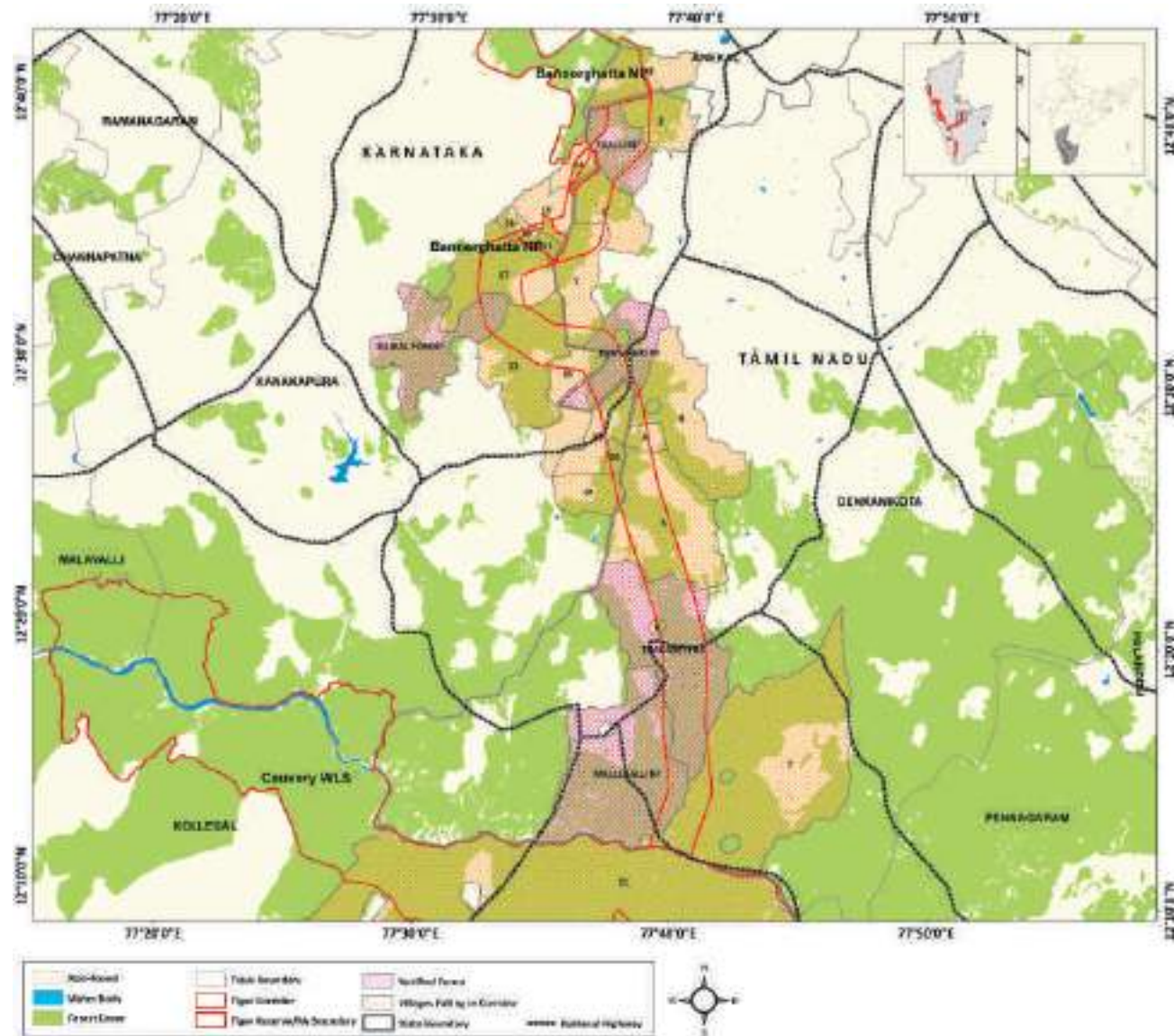


Figure 3.32:
Potential habitat connectivity for tiger movement between Cauveri-Bannerghata Corridor as depicted by CIRCUITSCAPE model

Figure 3.33:

Least Cost Pathway corridor for tiger movement between Cauveri-Bannerghata WLS overlaid with village map (the village numbers are referenced in Table 3.7)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Tamil Nadu	Dharmapuri	Denkanikottai	Achubalu	567	2581	762	3435
2			Denkanikottai	Gumlapuram	521	2667	723	3331
3			Denkanikottai	Chudasandiram	306	1628	393	1727
4			Denkanikottai	Nendimangalam	68	363	105	578
5			Denkanikottai	Madakkal	986	5228	1175	5383
6			Denkanikottai	Thaggatti	944	4429	1116	5153
7			Denkanikottai	Natrapalayam	1564	7029	2258	9687
8			Denkanikottai	Agalakotta A/b	NA	NA	NA	NA
9	Karnataka	Bangalore Urban	Anekal	Tammanayakanahalli	432	2271	549	2527
10		Bangalore Rural	Kanakapura	Linganapura	137	662	205	793
11			Kanakapura	Bantanalu	4	17	23	85
12			Kanakapura	Bijjahalli	276	1124	294	1130
13			Kanakapura	Kengalanatta Gollahalli	102	449	112	471
14			Kanakapura	Kattarinatta	36	182	43	138
15			Kanakapura	Elachavadi	NA	NA	NA	Na
16			Kanakapura	Bhimasandra	59	257	104	441
17			Kanakapura	Terubidi	335	1518	374	1601
18			Kanakapura	Gatgunda	719	3631	692	2816
19			Kanakapura	Kolagaudahalli	706	3502	712	3257
20			Kanakapura	Manjilnatha	NA	NA	NA	NA
21		Chamaraja Nagar	Kollegal	NA	NA	NA	82	335

Table 3.7:

Villages within the Least Cost Pathway Corridor between Cauveri-Bannerghata WLS as shown in Fig. 3.33

Figure 3.34:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Cauveri-Bannerghata



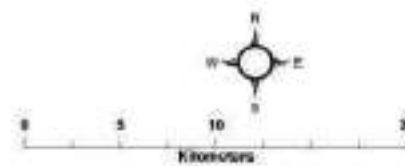
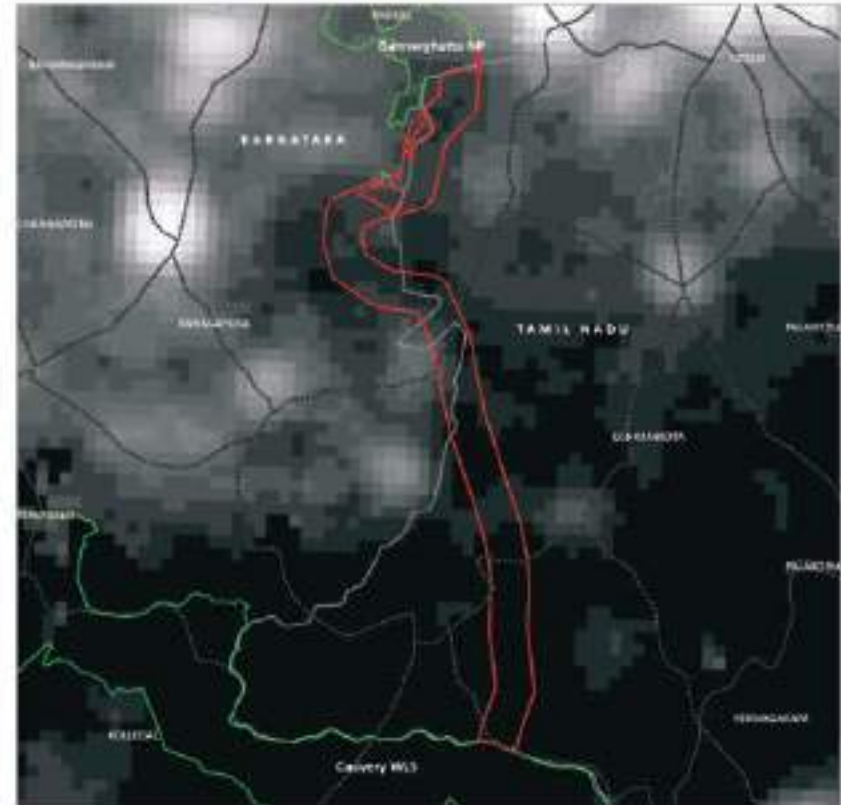
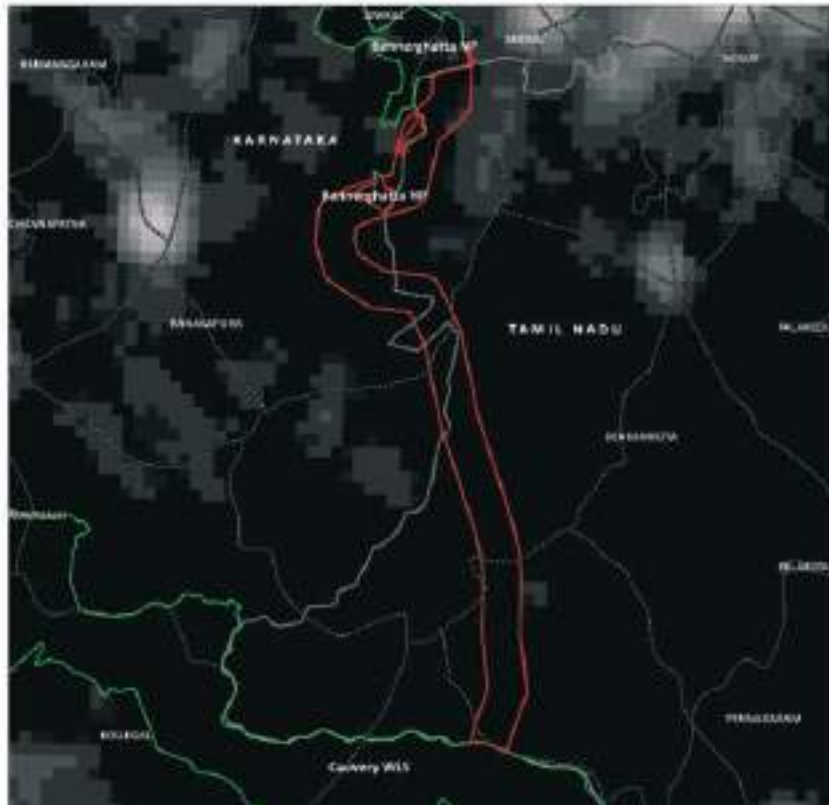


Figure 3.35:
Human habitation as depicted by nightlights within the Cauveri-Bannerghata landscape in the year 1992 and 2012

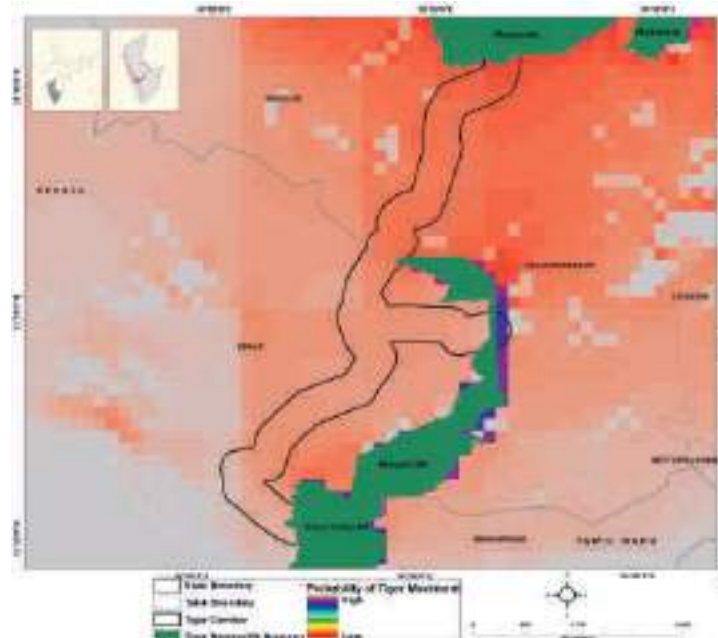
NAGARAHOLE-MUDUMALAI-WAYANAD

The Mudumalai landscape is connected through the forested slopes of the Nilgiris to the Mukurthi National Park in the south which is further connected to Silent Valley. Due to the rugged and steep nature of this connectivity, elephants are unlikely to use it, but it would serve as a viable corridor for tigers and other fauna. Towards the east, Sathyamangalam Wildlife Sanctuary connects with the corridor formed by the Moyar River valley connecting the Bandipur-Mudumalai complex with BRT Wildlife Sanctuary and on to Cauvery Wildlife Sanctuary.

Within the southern buffer of Mudumalai and its surroundings, the habitat is fragmented by large and small settlements like Masinagudi and Moyar colony. Many of these private lands are being developed into tourist resorts with elephant proof power fencing. Linear infrastructure like the power channel from Masinagudi to Moyar and the water pipeline from Glenmorgan to Singara further prevent free movement of species like elephants across these forests. Restrictions on unfriendly developments and mitigation of existing linear infrastructure are needed for full utilization of this landscape by wildlife. Addressing the above issues and legitimizing the two corridors defined by the Least Cost Pathways would enhance the conservation potential of this important reserve complex further.

Figure 3.36:

Potential habitat connectivity for tiger movement between Mudumalai-Mukurthi-Silent Valley Corridor as depicted by CIRCUITSCAPE model



Mudumalai-Mukurthi-Silent Valley Corridor

Habitat size	40589 Km ²
Source Population	Bandipur-Nagarahole-Mudumalai-Wayanad
Size of Source	382 (354-411) tigers in 11100 Km ²
Protected Areas	Mudumalai NP Mukurthi NP Silent Valley NP
Corridors	Mudumalai NP-Mukurthi NP Mudumalai NP-Silent Valley NP Mukurthi NP-Silent Valley NP

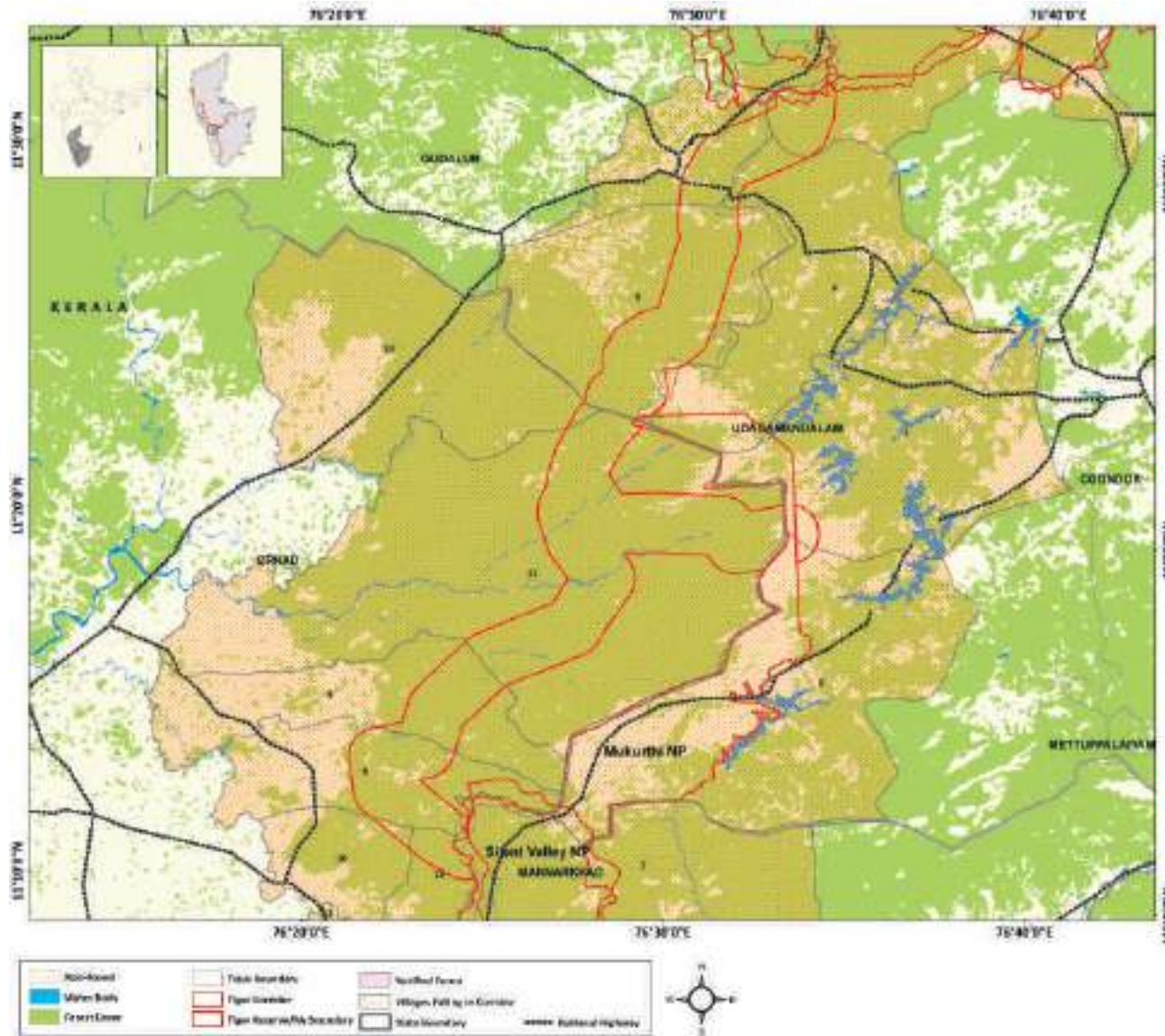


Figure 3.37:
Least Cost Pathway corridor for tiger movement between Mudumalai-Mukurthi-Silent Valley overlaid with village map (the village numbers are referenced in Table 3.8)

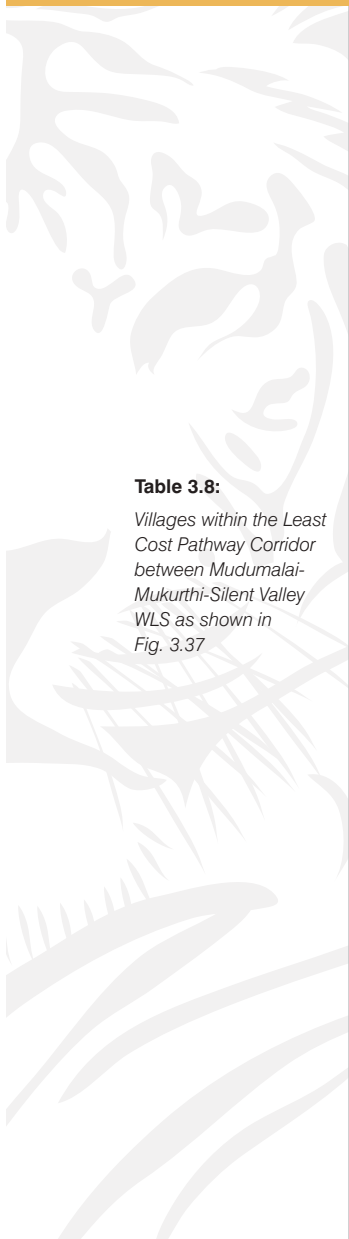


Table 3.8:

Villages within the Least Cost Pathway Corridor between Mudumalai-Mukurthi-Silent Valley WLS as shown in Fig. 3.37

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Tamil Nadu	The Nilgiris	Udhagamandalam	Nanjanad	3553	14310	3621	13007
2			Kundah	Mulligoor	1491	5393	1363	4647
3			Gudalur	Gudalur (tn-1)	9508	43096	12101	49535
4			Udhagamandalam	Naduvattam	2572	11370	2340	8505
5			Gudalur	Ovalley	5465	24793	5307	21943
6			Udhagamandalam	Masinigudi	NA	NA	NA	NA
7	Kerala	Palghat	Mannarkkad	Padavayal	1686	6764	1719	6144
8		Malappuram	Ernad	Amarambalam	6284	31928	7841	35975
9			Ernad	Chekkode	3042	16850	3841	19510
10			Ernad	Kalikavu	4504	25861	4435	22018
11			Ernad	Karulai	4685	24336	5537	25758
12			Ernad	Kerala Estate	1818	10299	2893	14871
13			Ernad	Vazhikkadavu	8308	44083	9972	47322



Figure 3.38:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Mudumalai-Mukurthi-Silent Valley WLS

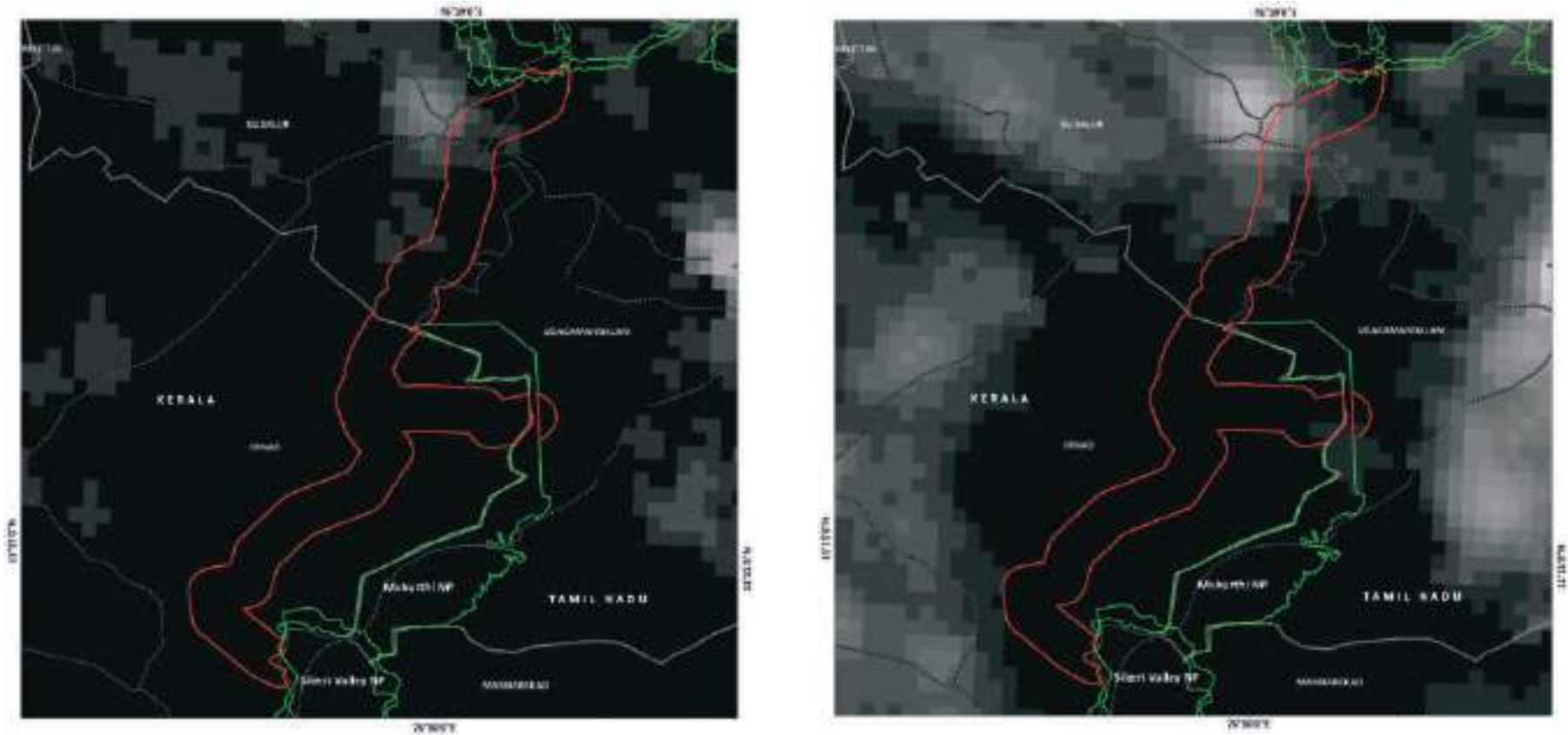
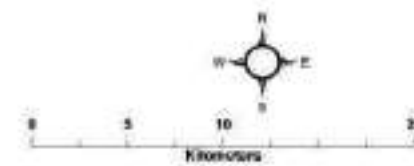
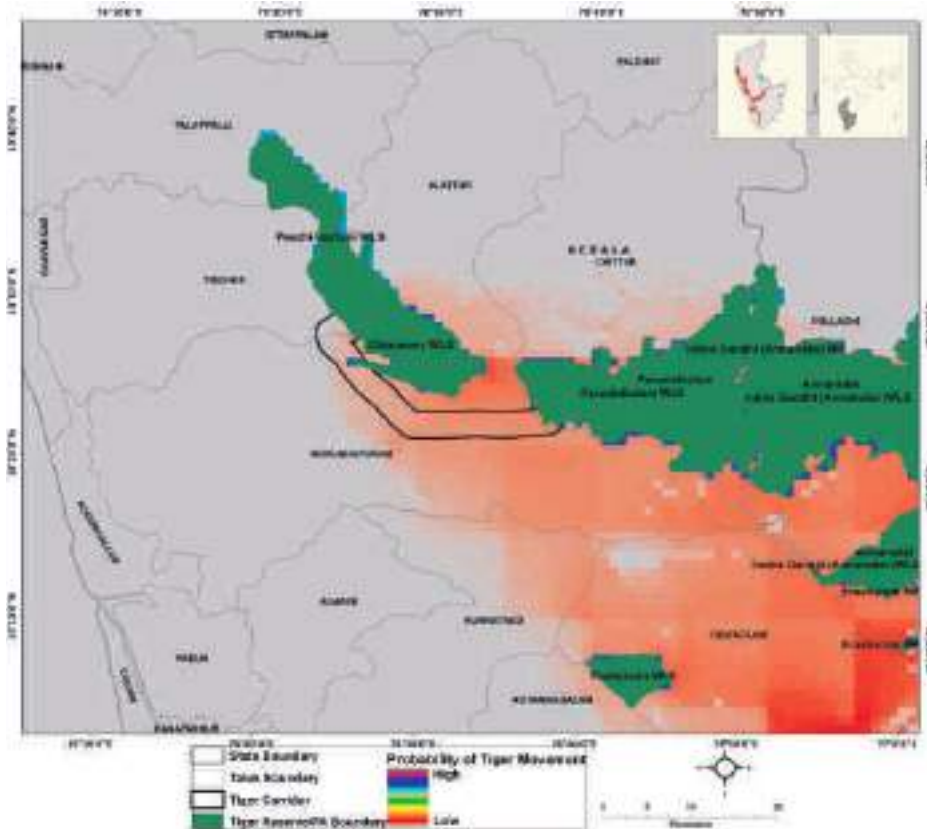


Figure 3.39:

Human habitation as depicted by nightlights within the Mudumalai-Mukurthi-Silent Valley WLS landscape in the year 1992 and 2012



PARAMBIKULAM-ERAVIKULAM-INDIRA GANDHI

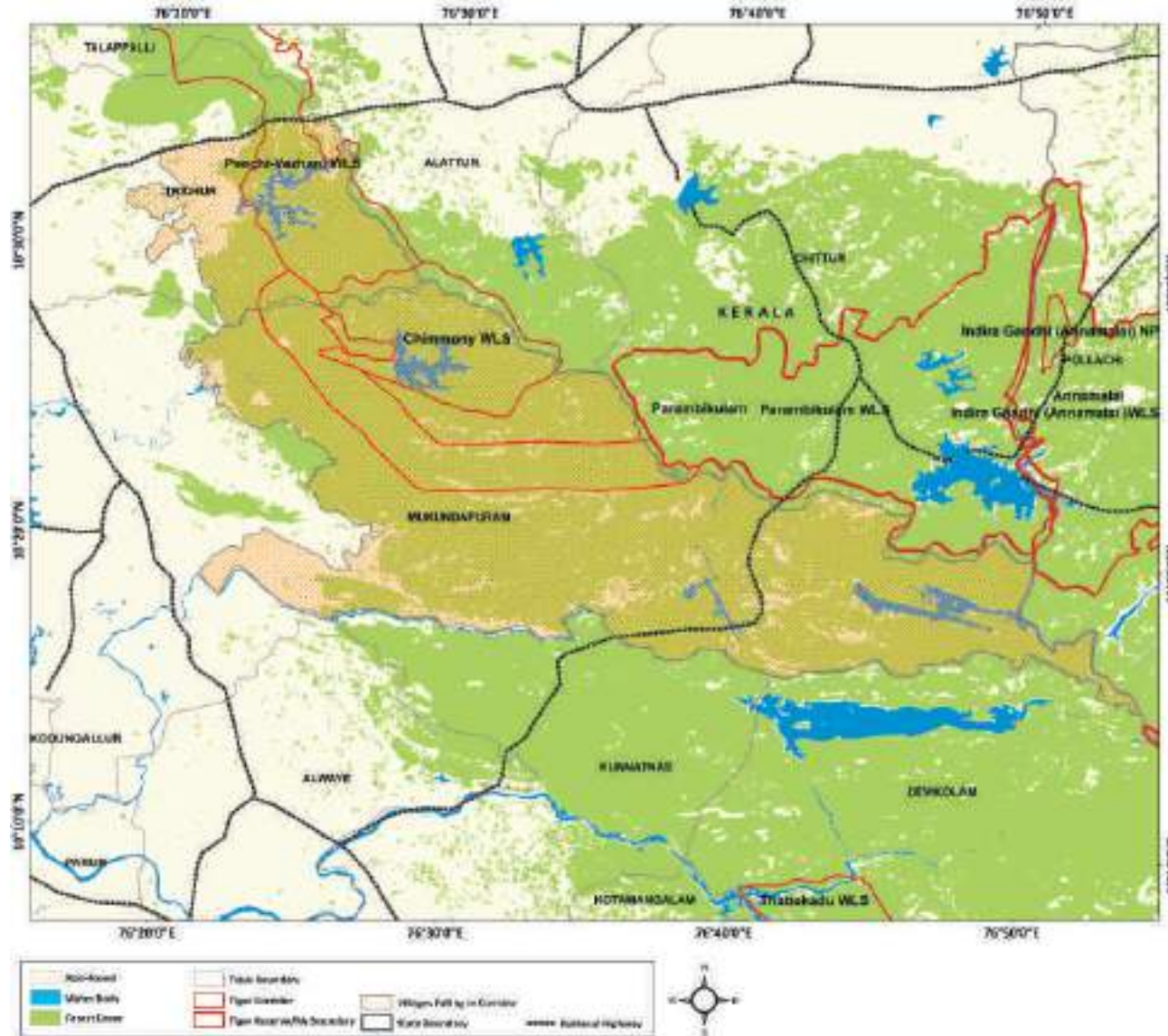


This is the first major tiger population south of the Palghat Gap, which is a major barrier to geneflow from the northern Western Ghats to the southern Western Ghats for most wildlife species including tigers, due to its high human density. This tiger population is spread over Parambikulam Tiger Reserve, Eravikulam National Park and Chinnar Wildlife Sanctuary in Kerala; and Indira Gandhi (Annamalai) Tiger Reserve in Tamil Nadu. The landscape has shown good recovery due to good management of the several reserves constituting the complex, lower human pressures due to the difficult terrain and contiguous nature of the tiger habitat. Within Kerala, this zone comprises of several Protected Areas which include Peechi-Vazhani Wildlife Sanctuary, Chimmony Wildlife Sanctuary, Eravikulam National Park, Chinnar Wildlife Sanctuary and Parambikulam Tiger Reserve. The tiger habitat in this zone is contiguous with the Indira Gandhi (Annamalai) Tiger Reserves in Tamil Nadu and with, Anaimudi and Pambadum Shola National Park which are located within Devikulam taluka of Idukki district in Kerala. All of these Protected Areas are connected through forested habitats interspersed with plantations, agriculture, and settlements, consisting of a habitat matrix that is permeable for movement of wildlife. However, two formal corridor systems are required: one connecting Peechi-Chimmony to Parambikulam and second, connecting Anaimudi Shola National Parks to Pambadum Shola which further extends into Mathikettan Shola National Park. This connectivity extends further south

Figure 3.40:
Potential habitat connectivity for tiger movement between Chimmony-Parambikulam Corridor as depicted by CIRCUITSCAPE model

Figure 3.41:

Least Cost Pathway corridor for tiger movement between Chimmony-Parambikulam WLS overlaid with village map (the village numbers are referenced in Table 3.9)



along the border of Kerala and Tamil Nadu as narrow ridge top forests of the Ghats, through plantations and agriculture west of the Ghat ridge, connecting the population of this landscape with that of Periyar-Kalakad-Mundanthurai. This connectivity is very precarious and needs ground verification as the least cost pathways traverse lot of privately owned lands and distinguishing between plantations and forests through remotely sensed data was difficult. Ground verification is required urgently and conservation action is needed to secure this connectivity. Tiger occupancy on the Kerala side of this landscape was 1,483 km² with an estimated population of 32 to 36 tigers. This area showed a significant increase in both, the area occupied by tigers since 2006 and their abundance.

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	KERALA	THRISSUR	Mukundapuram	Pariyaram	7560	31615	8122	31195
2			Thrissur	Peechi	5083	22409	6706	26946



Table 3.9.
Villages within the Least Cost Pathway Corridor between Chimmony-Parambikulam WLS as shown in Fig. 3.41

Figure 3.42:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Chimmony-Parambikulam WLS

Chimmony-Parambikulam Corridor	
Habitat size	13233 Km ²
Source Population	Parambikulam-Indira Gandhi
Size of Source	3a4 (32-36) tigers in 3253 Km ²
Protected Areas	Chimmony WLS Parambikulam WLS
Corridors	Parambikulam WLS-Chimmony WLS Corridor

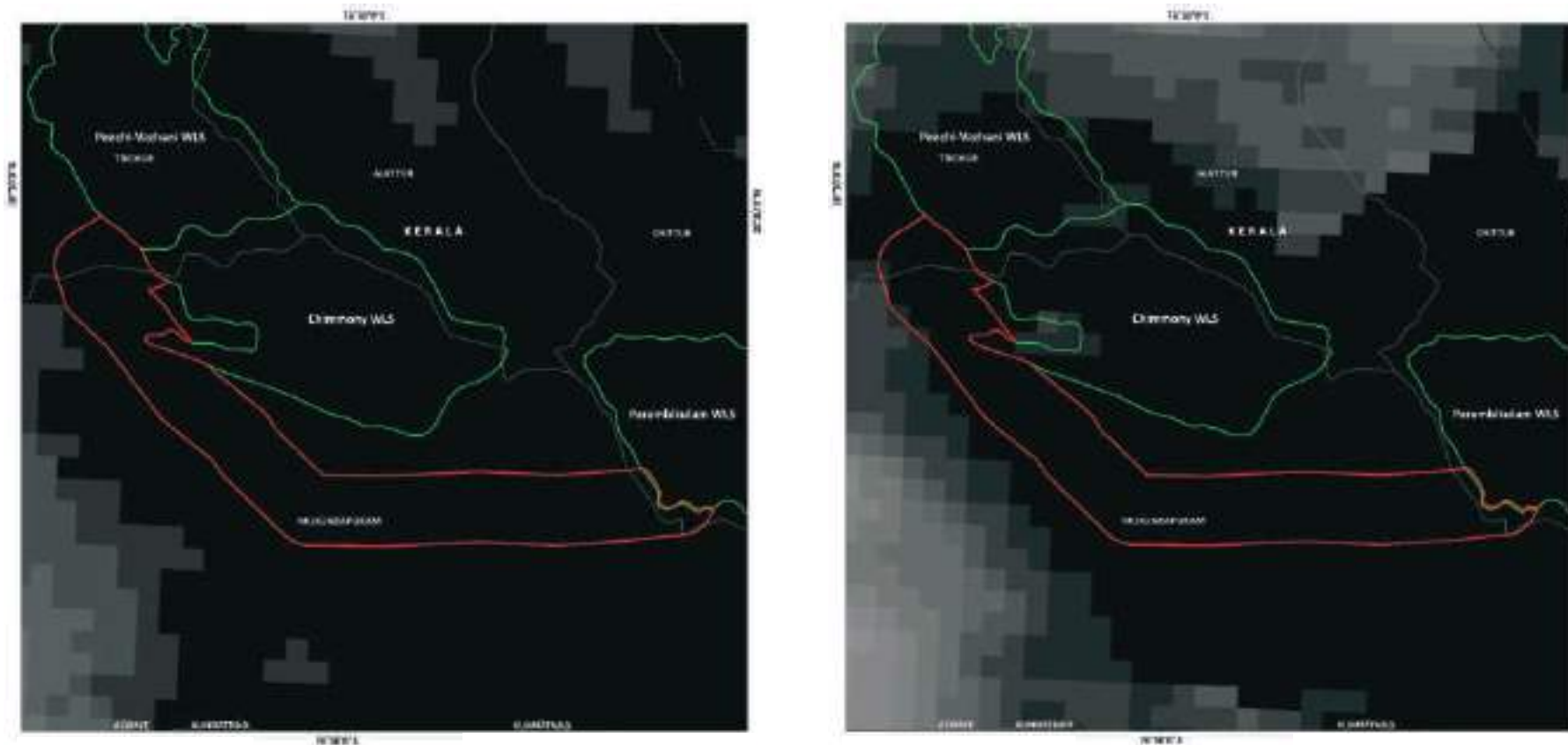
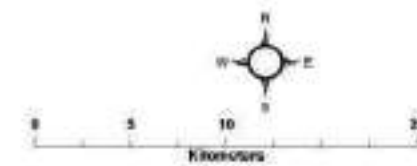


Figure 3.43:

Human habitation as depicted by nightlights within the Chimmony-Parambikulam WLS landscape in the year 1992 and 2012



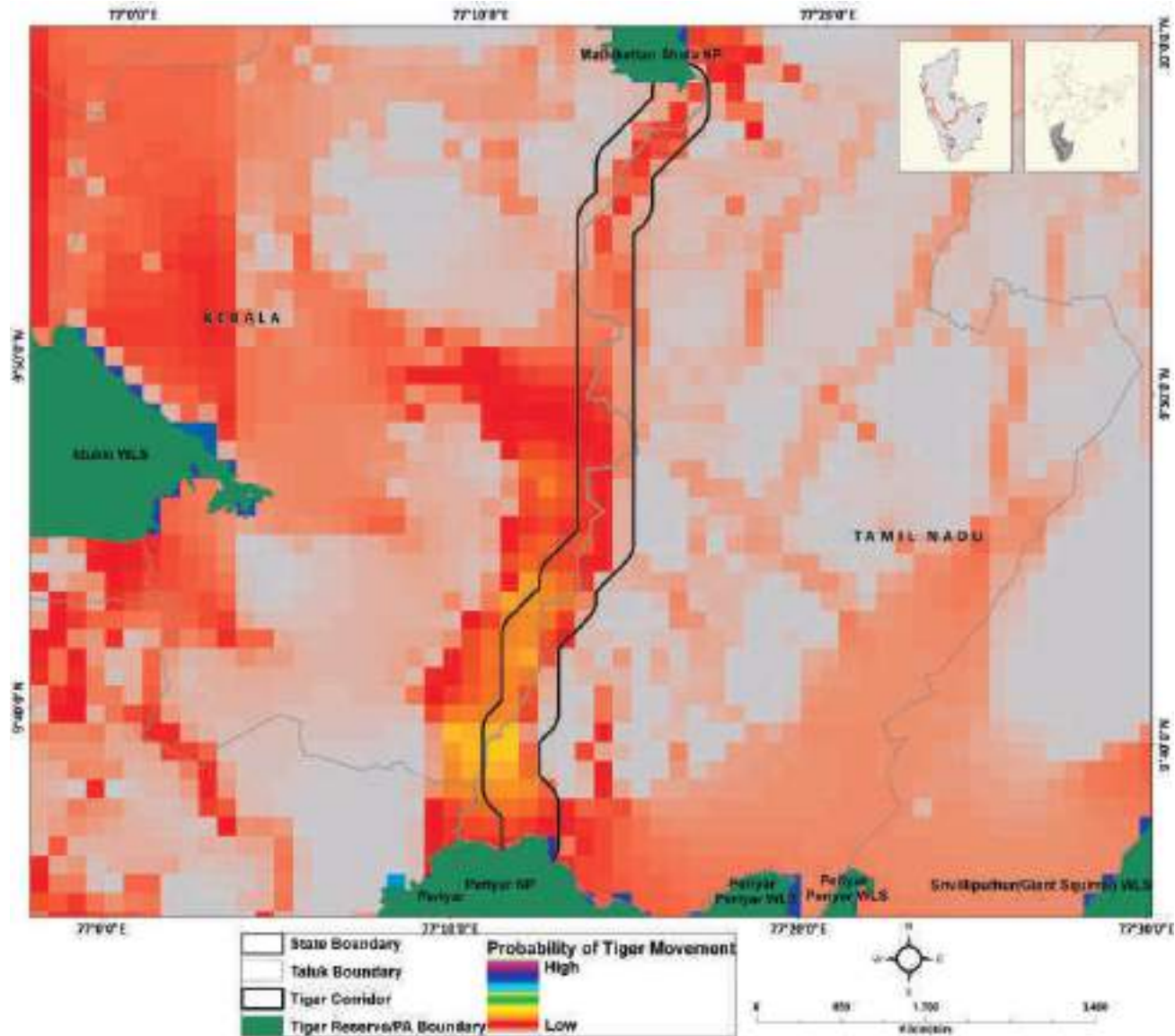
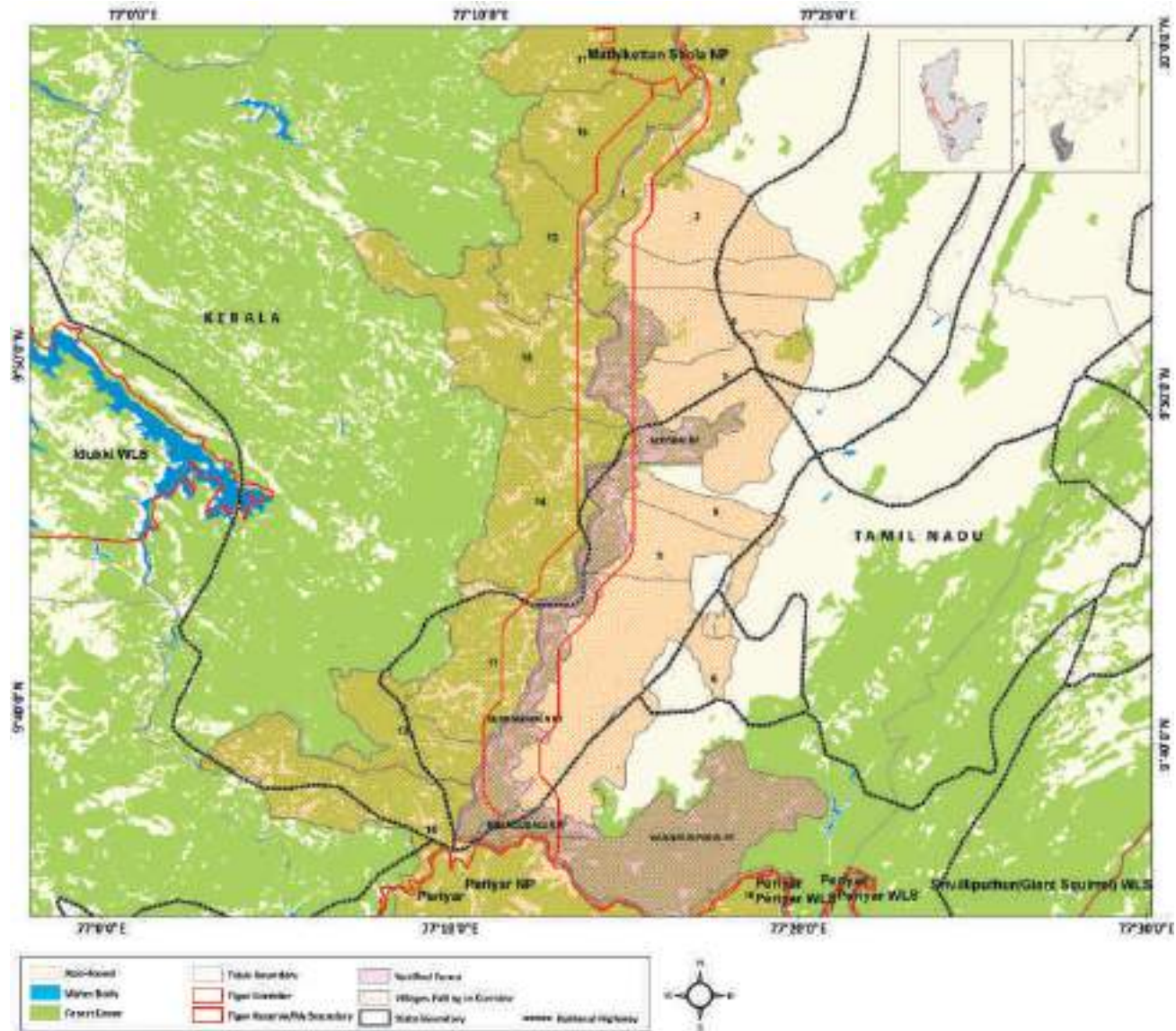


Figure 3.44:
Potential habitat connectivity for tiger movement between Mathikettan-Periyar Corridor as depicted by CIRCUITSCAPE model

Figure 3.45:

Least Cost Pathway corridor for tiger movement between Mathikettan-Periyar overlaid with village map (the village numbers are referenced in Table 3.10)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Tamil Nadu	Theni	Uthamapalayam	Thevaram Hills	NA	NA	NA	NA
2			Bodinayakanur	Bodi Hill West	NA	NA	NA	NA
0			Uthamapalayam	Vannathiparai Rf	165	477	NA	NA
3			Uthamapalayam	Thevaram A/d	3549	14637	4225	16079
4			Uthamapalayam	Pannaipuram A/c	1924	8347	2311	9323
5			Uthamapalayam	Pudupatti	2537	10015	191	730
6			Uthamapalayam	Gudalur (TN-2)	9308	35531	12001	41915
0			Uthamapalayam	Kombai Rf	NA	NA	NA	NA
0			Uthamapalayam	Suranganur Rf	NA	NA	NA	NA
0			Uthamapalayam	Melagudalur Rf	NA	NA	NA	NA
7			Uthamapalayam	T. Meenakshipuram A/b	NA	NA	NA	NA
8			Uthamapalayam	Kobai East And West	NA	NA	NA	NA
9			Uthamapalayam	Uthamapuram A/c	NA	NA	NA	NA
10	Kerala	Idukki	Udumbanchola	Kumily	6666	28652	7404	30276
11			Udumbanchola	Anakkara	5523	23934	5214	24699
12			Udumbanchola	Chakkupallam	3039	12242	3429	12609
13			Udumbanchola	Chathurangapara	1481	5325	1306	4177
14			Udumbanchola	Karunapuram	7426	31981	7571	30473
15			Udumbanchola	Parathodu	5316	21525	5444	20417
16			Udumbanchola	Santhanpara	2211	8425	1985	6782
17			Udumbanchola	Poopara	NA	NA	NA	NA

Table 3.10:

Villages within the Least Cost Pathway Corridor between Mathikettan-Periyar as shown in Fig. 3.45

Mathikettan-Periyar Corridor

Habitat size	13233 Km ²
Source Population	KMTR-Periyar
Size of Source	38 (36-40) tigers in 3812 Km ²
Protected Areas	Mathikettan Shola NP Periyar WLS
Corridors	Periyar WLS-Mathikettan Shola NP Corridor

Figure 3.46:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Mathikettan-Periyar



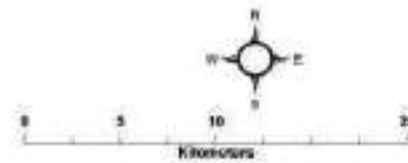
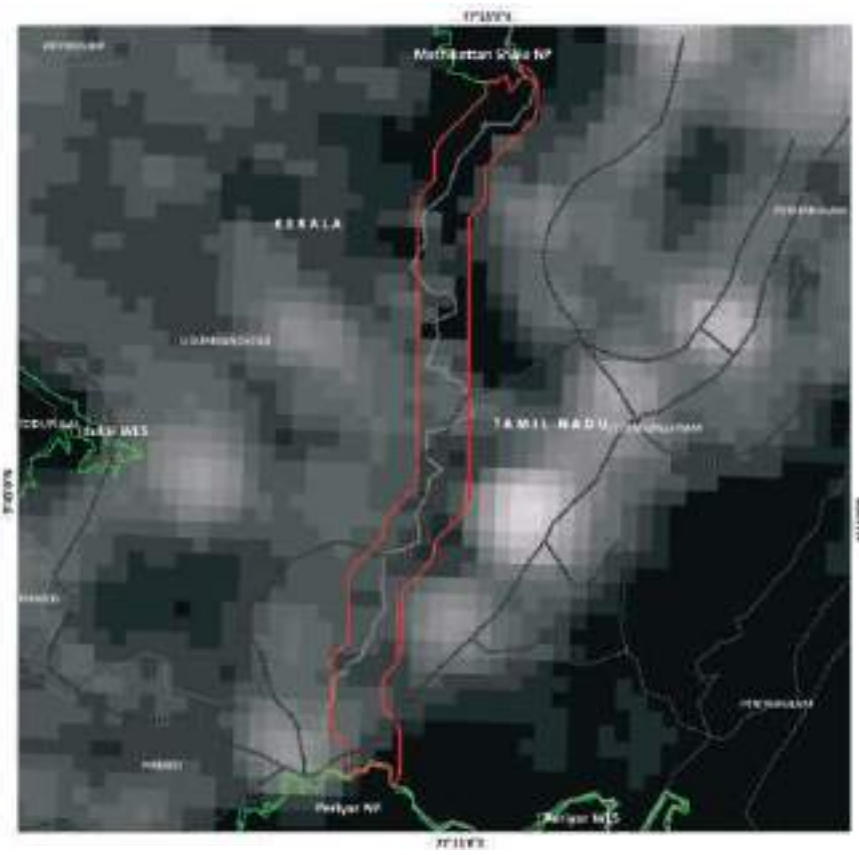
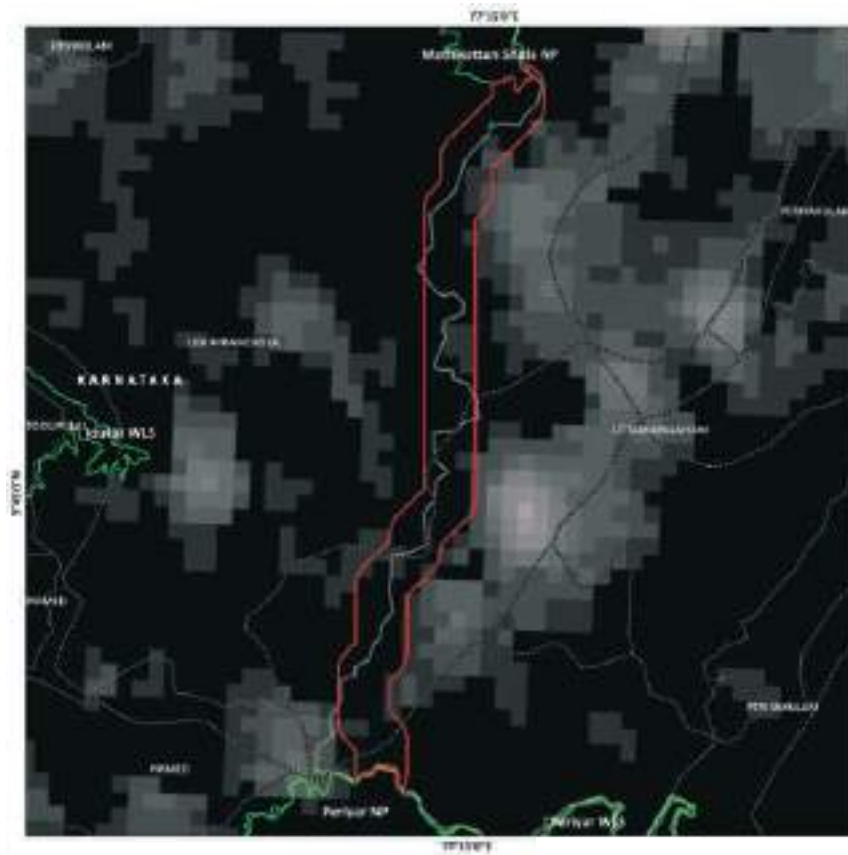
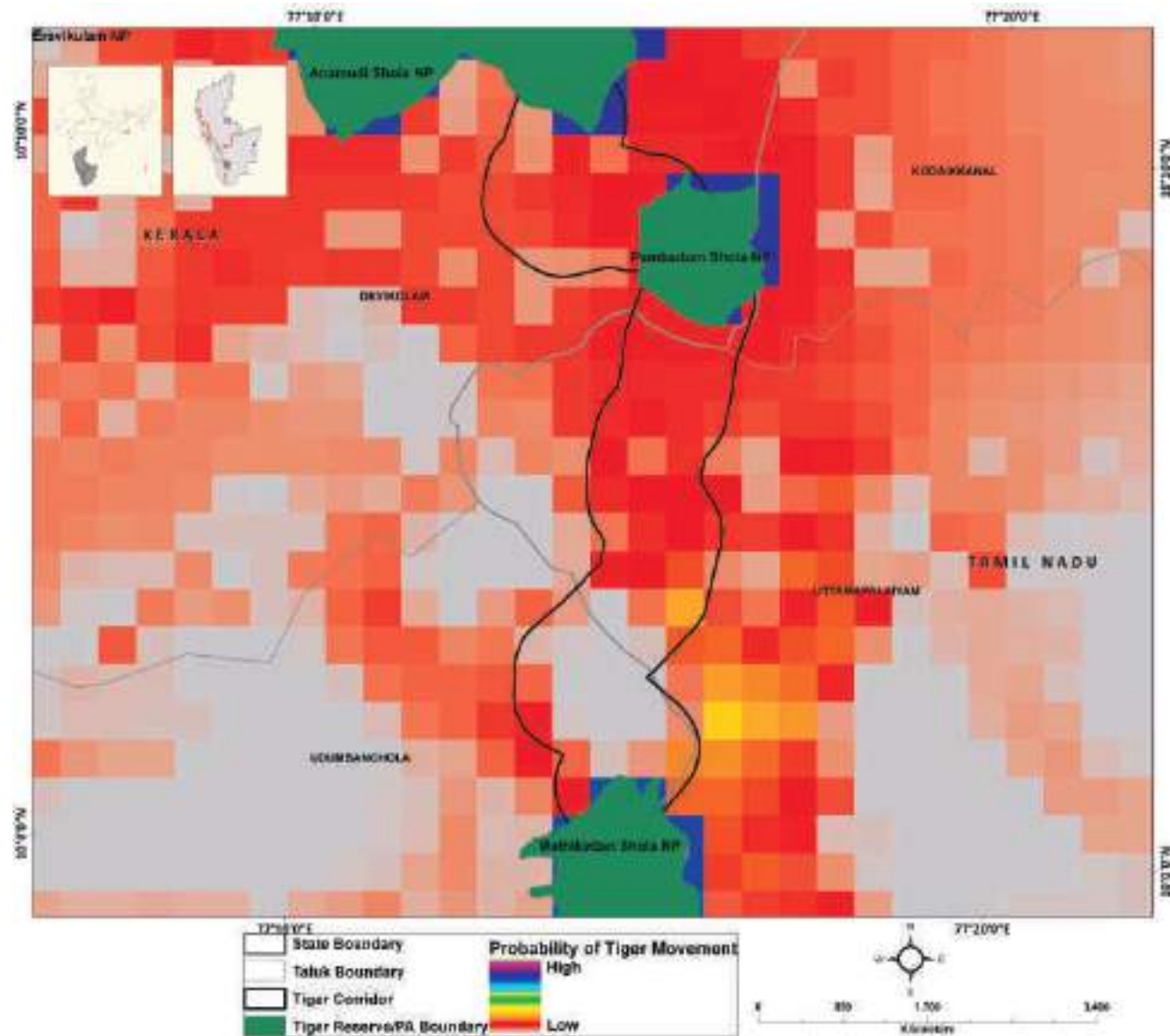


Figure 3.47:
Human habitation as depicted by nightlights within the Mathikettan-Periyar landscape in the year 1992 and 2012

Figure 3.48:

Potential habitat connectivity for tiger movement between Mathikettan Shola NP, Pambadum Shola NP, Anamudi Shola NP as depicted by CIRCUITSCAPE model



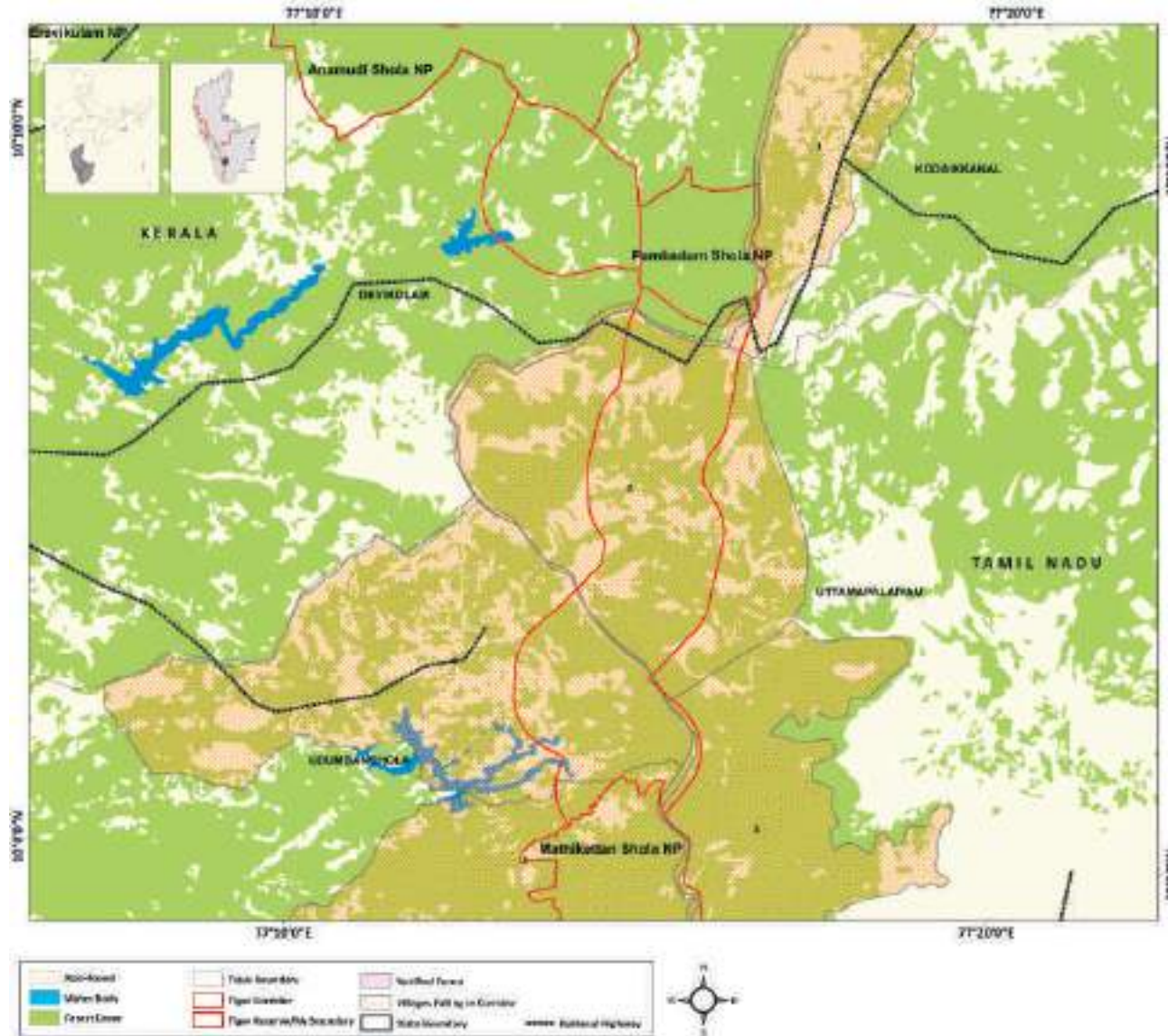


Figure 3.49:

Least Cost Pathway corridor for tiger movement between Mathikettan Shola NP- Pambadum Shola NP- Anamudi Shola NP overlaid with village map (the village numbers are referenced in Table 3.11)

*Partial village information for Kerala, falling within the corridor was unavailable

Table 3.11:

Villages within the Least Cost Pathway Corridor between Mathikettan Shola NP-Pambadum Shola NP-Anamudi Shola NP as shown in Fig. 3.49

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Tamil Nadu	Dindigul	Kodaikanal	Mannavanur	1437	5927	2223	8117
2	Tamil Nadu	Theni	Bodinayakanur	Kottagudi	557	1912	910	3272
3	Tamil Nadu	Theni	Bodinayakanur	Bodi Hill West	NA	NA	NA	NA
4	Kerala	Idukki	Udumbanchola	Chinnakanal	3095	12949	3210	12005
5			Udumbanchola	Poopara	NA	NA	NA	NA

Mathikettan Shola NP-Pambadum Shola NP-Anaimudi Shola NP Corridor

Habitat size	13233 Km ²
Source Population	KMTR-Periyar
Size of Source	38 (36-40) tigers in 3812 Km ²
Protected Areas	Mathikettan Shola NP Pambadum Shola NP Anamudi Shola NP
Corridors	Mathikettan Shola NP-Pambadum Shola NP Pambadum Shola NP-Anaimudi Shola NP

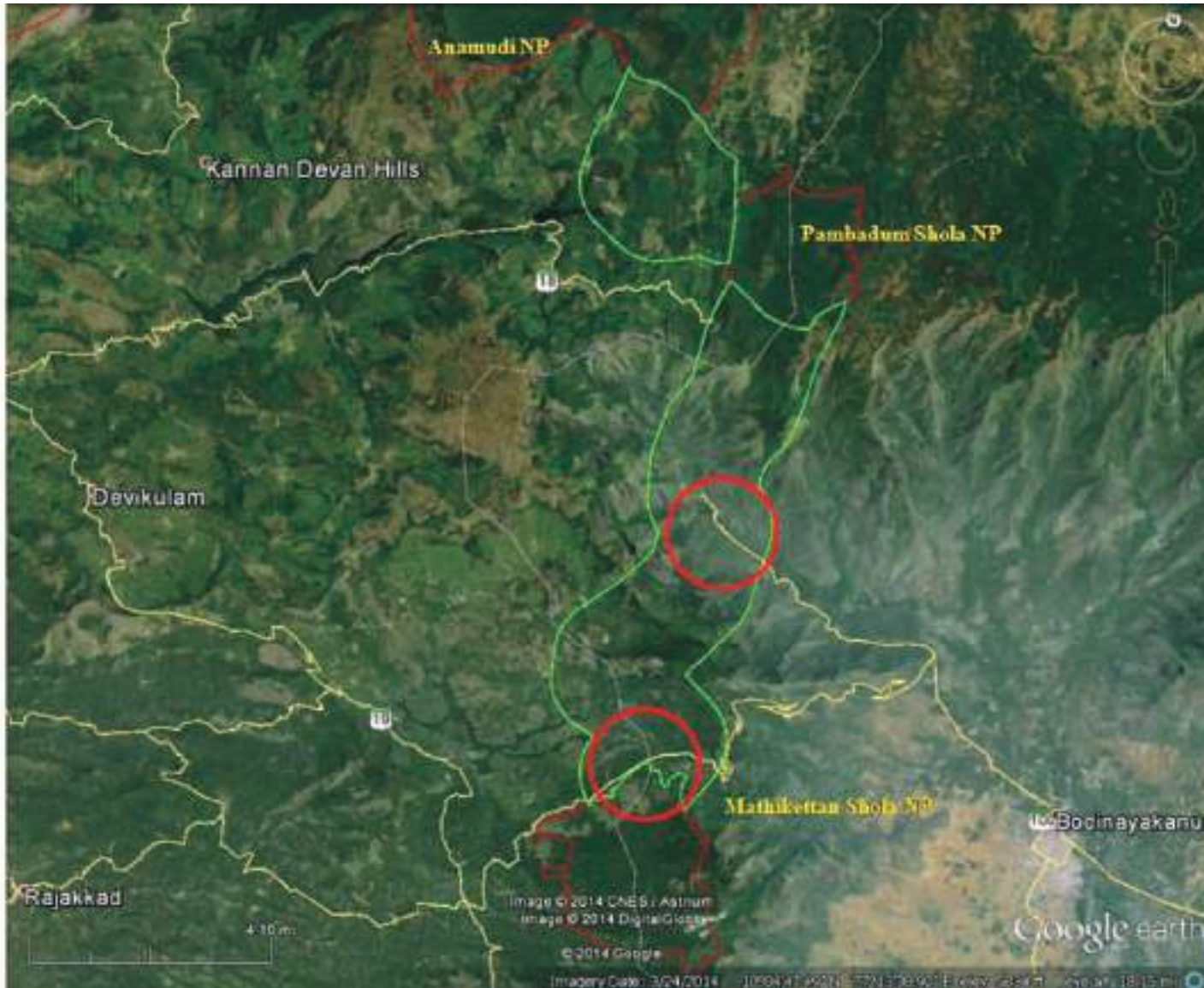


Figure 3.50:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Mathikettan Shola NP-Pambadum Shola NP-Anaimudi Shola NP

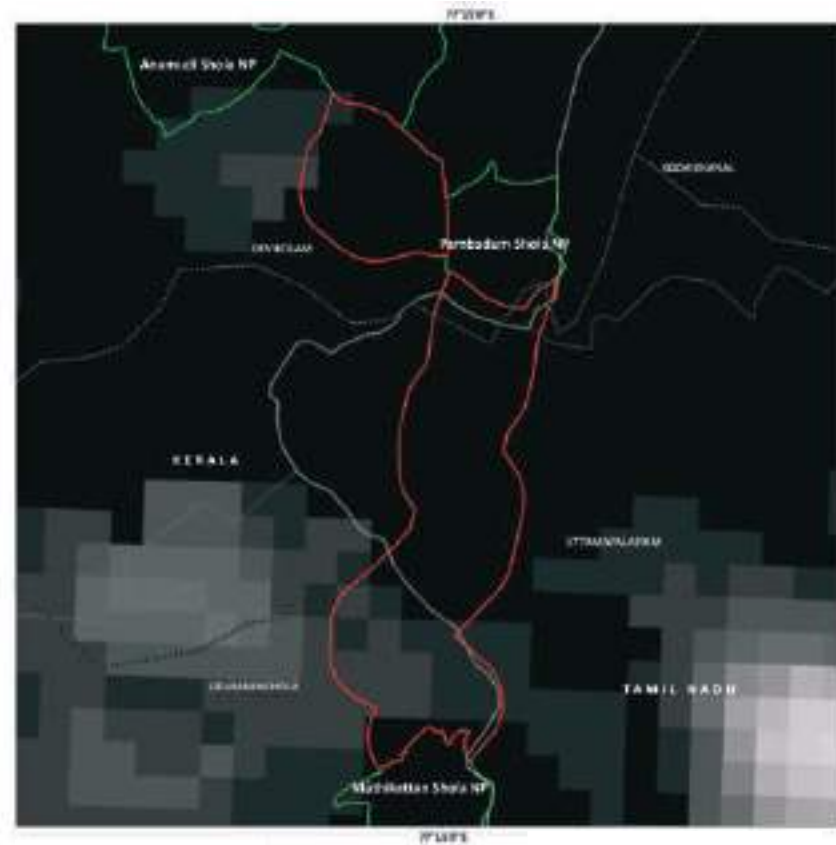
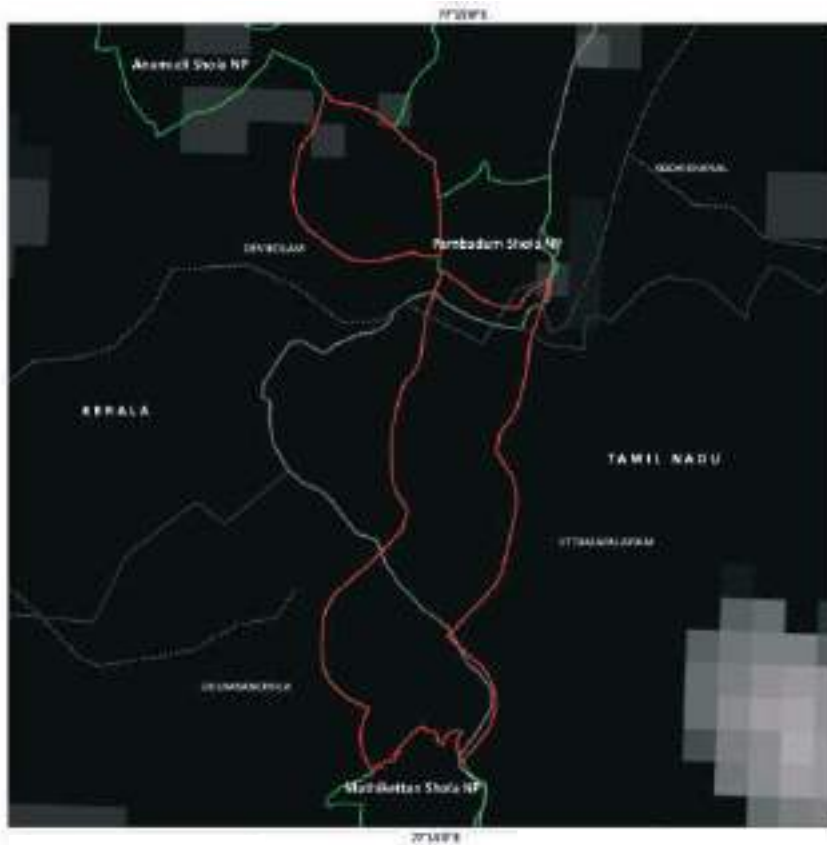
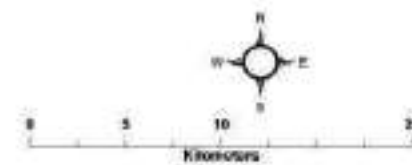


Figure 3.51:

Human habitation as depicted by nightlights within the Mathikettan Shola NP-Pambadum Shola NP-Anaimudi Shola NP landscape in the year 1992 and 2012



KALAKAD-MUNDANTHURAI-PERIYAR

This complex extends from Periyar Tiger Reserve in Kerala and is contiguous with Peppara Wildlife Sanctuary in Nedumangad taluka of Trivandrum and Neyyar Wildlife Sanctuary in Neyyattinkara taluka of Trivandrum district. Shendurney Wildlife Sanctuary is located in Pathanapuram district of Kollam. All three of these Protected Areas are contiguous with Kanyakumari Wildlife Sanctuary and Kalakad-Mundanthurai Tiger Reserve in Tamil Nadu. This landscape has tiger occupancy in about 2,121 km² with an estimated tiger population between 36 and 40. The connectivity between Periyar complex and the Protected Areas to the south of Periyar are an essential element for long term tiger persistence within this landscape complex. The corridor identified by the Least Cost Pathway traverses hilly forested terrain, interspersed by plantations and habitation. It meets major barriers to wildlife movement near the township of Aryankavu in the form of high human densities, road and rail traffic. Mitigation measures need to be implemented here to maintain the wildlife value of this corridor.

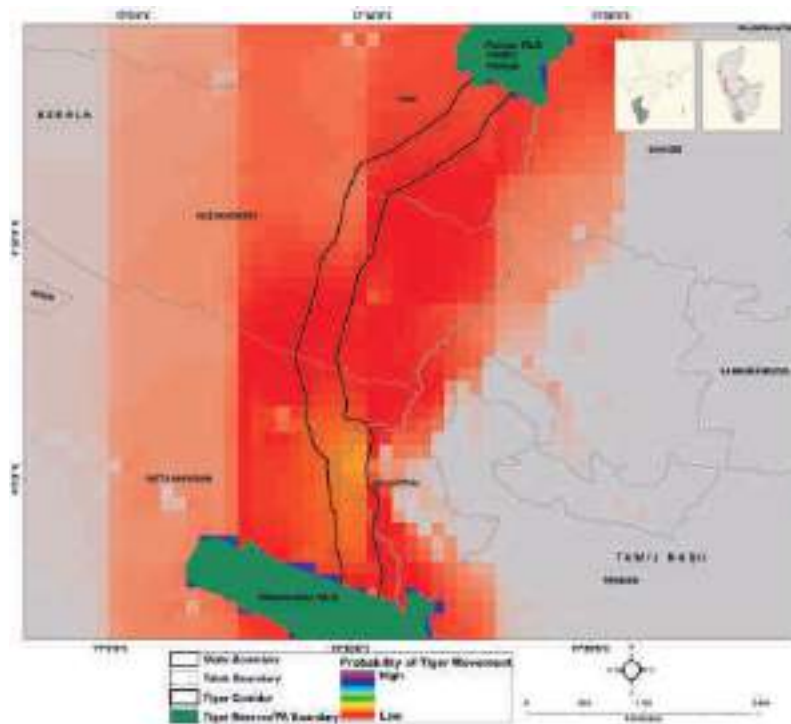


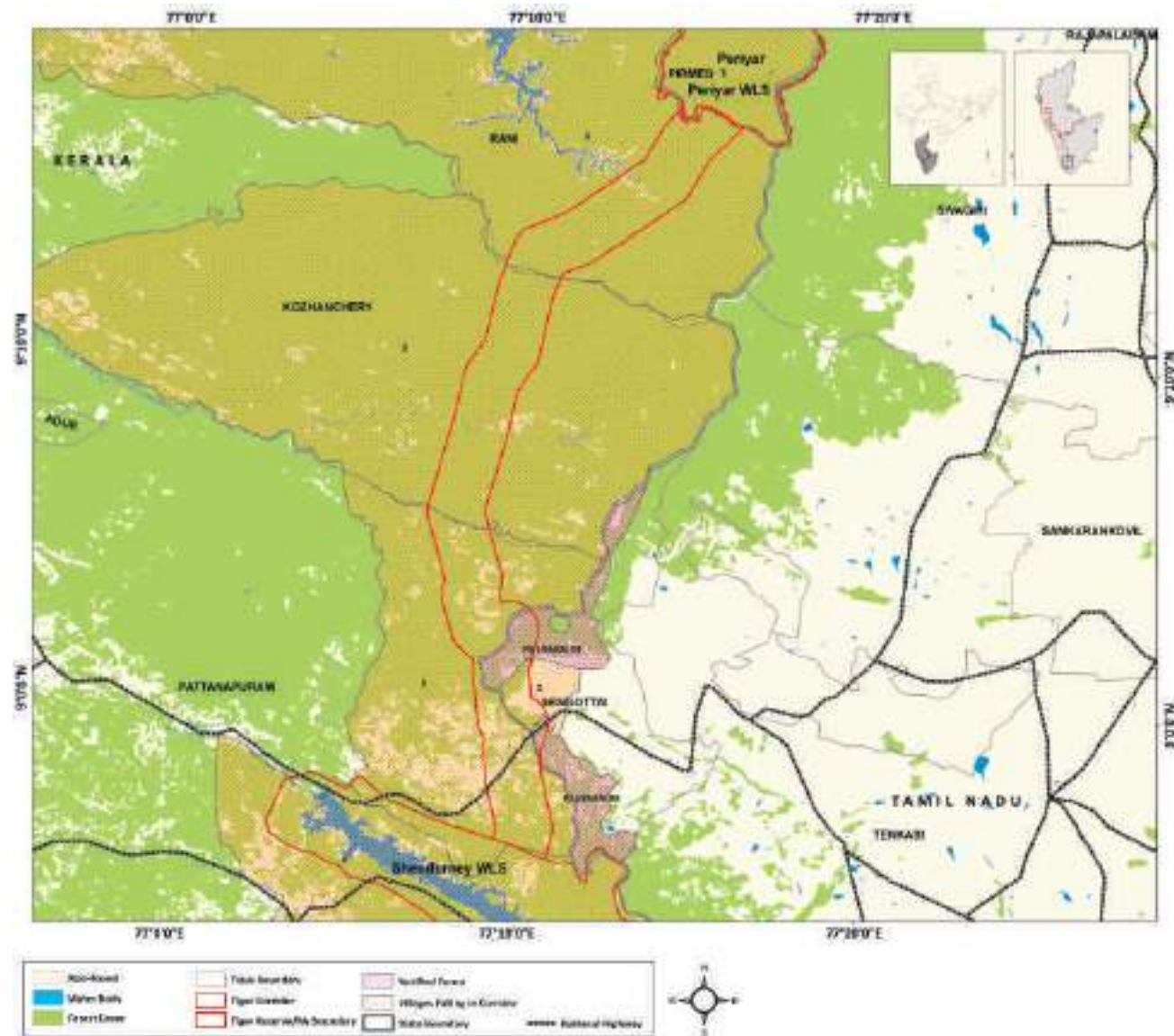
Figure 3.52:
Potential habitat connectivity for tiger movement between Periyar-Shendurney WLS as depicted by CIRCUITScape model

Periyar-Shendurney WLS Corridor

Habitat size	13233 Km ²
Source Population	KMTR-Periyar
Size of Source	30 (36-40) tigers in 3812 Km ²
Protected Areas	Periyar WLS Shendurney WLS
Corridors	Periyar WLS-Shendurney WLS

Figure 3.53:

Least Cost Pathway corridor for tiger movement between Periyar-Shendurney WLS overlaid with village map (the village numbers are referenced in Table 3.12)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Tamil Nadu	Tirunelveli	Shenkottai	Puliyarai A/b	NA	NA	NA	NA
2	Kerala	Pattanamtitta	Kozhanchery	Aruvappulam	4039	16183	3872	13801
3		Quilon	Pattanapuram	Arienkavu	3162	12125	2910	10144
4			Pattanapuram	Kulathupuzha	3519	14749	4145	15931
5		Idukki	Pirmed	Mlappara	307	1125	314	1129
6		Pattanamtitta	Rani	Chittar-Seethathodu	8405	33977	8722	31969

Table 3.12:

Villages within the Least Cost Pathway Corridor between Periyar-Shendurney WLS as shown in Fig. 3.53

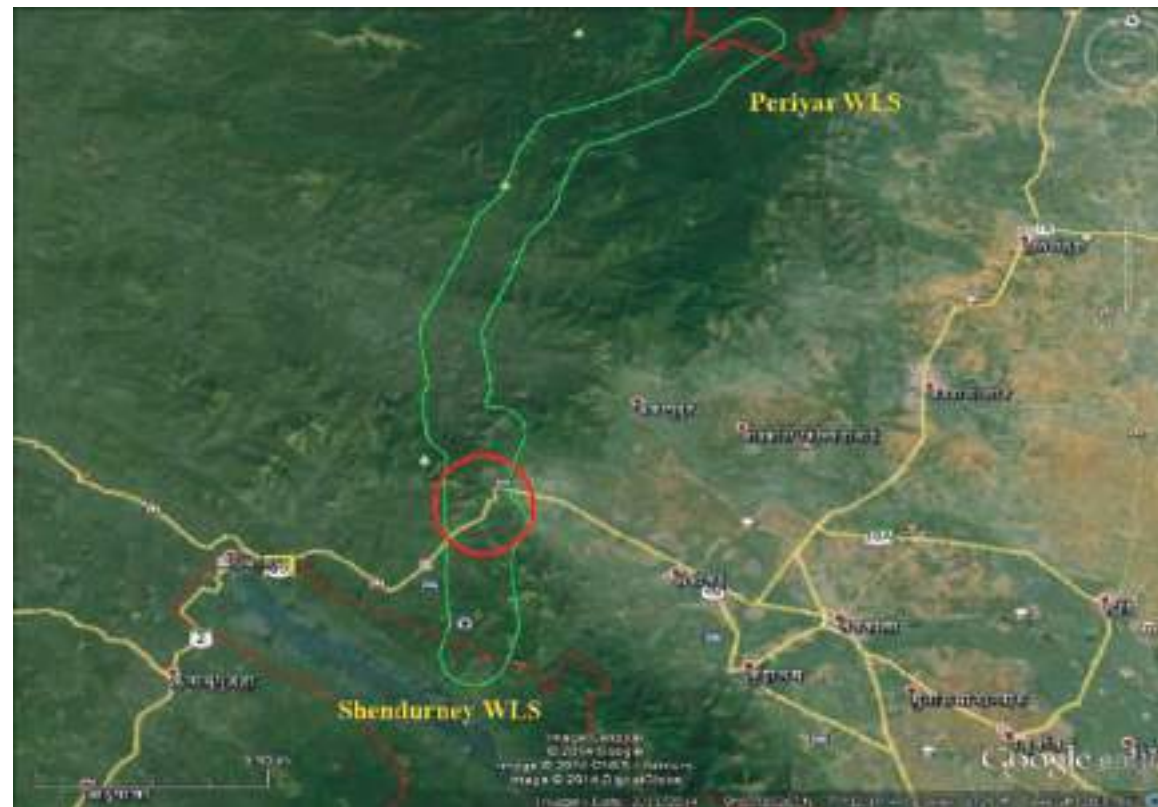


Figure 3.54:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Periyar-Shendurney WLS

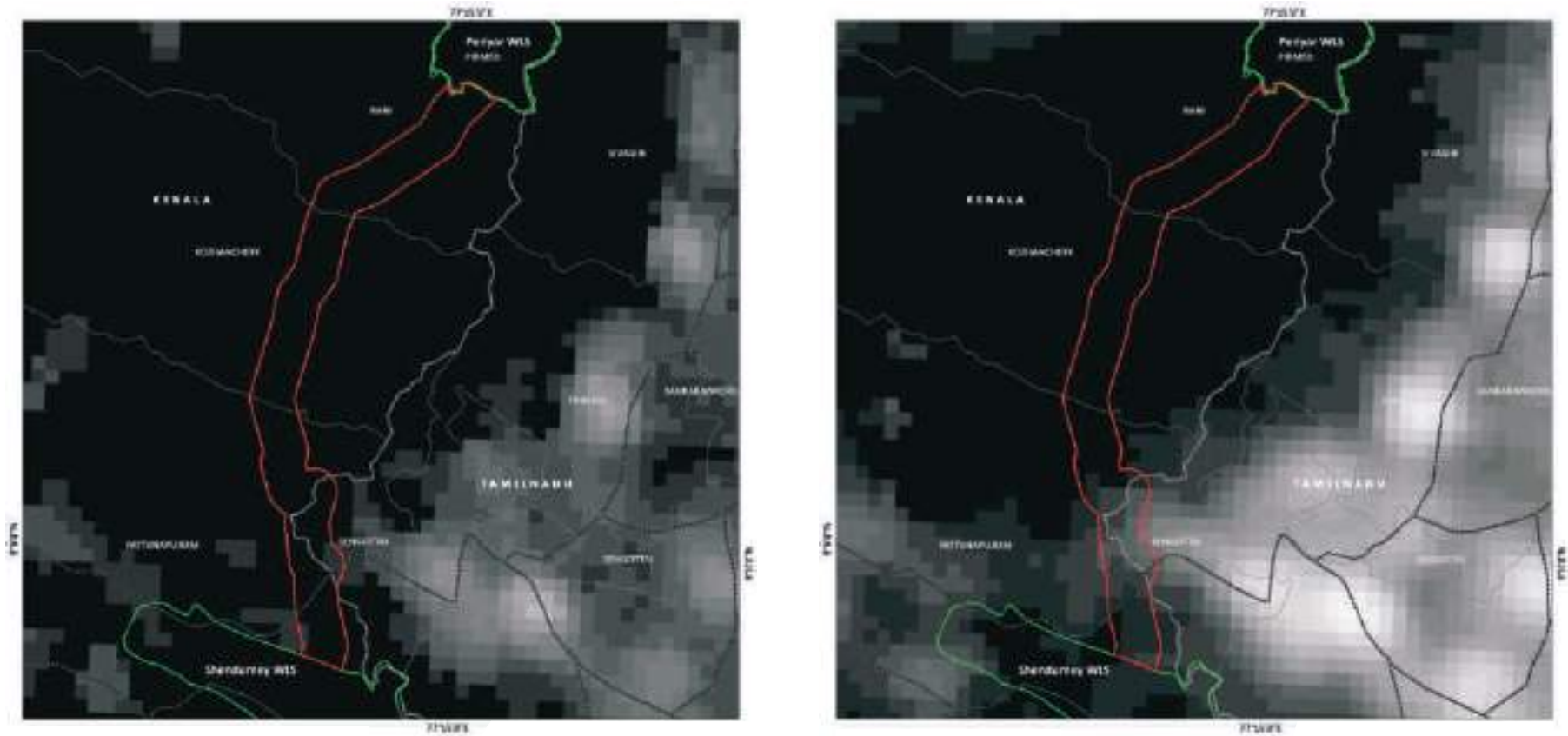
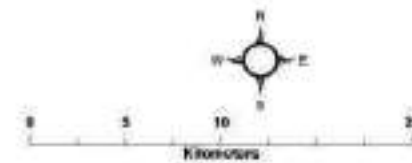


Figure 3.55:

Human habitation as depicted by nightlights within the Periyar-Shendurney WLS landscape in the year 1992 and 2012





NORTH EAST



4

NORTH-EAST LANDSCAPE

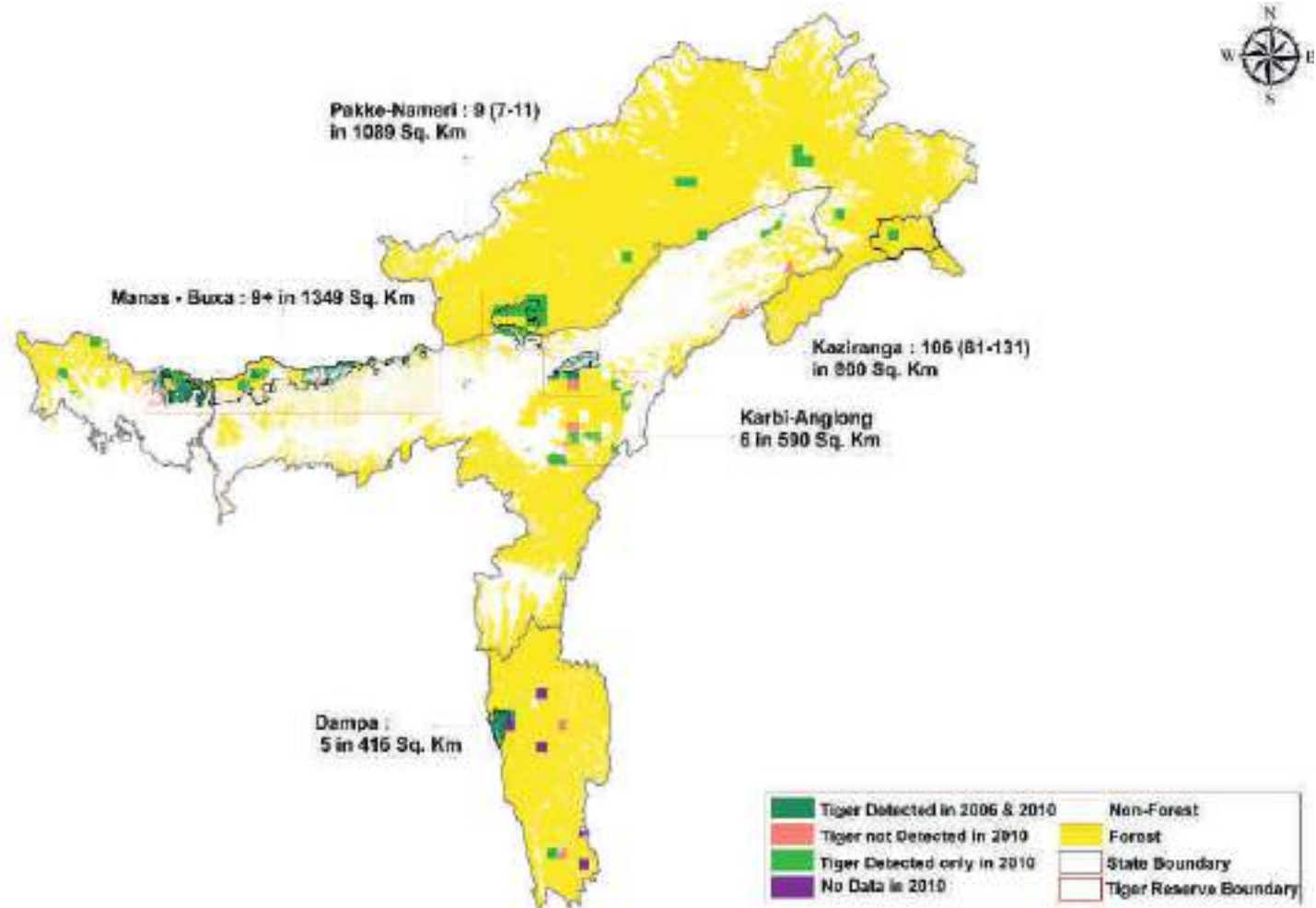
The tiger populations in this landscape have historical evolutionary significance as they share the connecting gene pool with south east Asian tiger populations and represent the entry point of tigers into the Indian sub-continent. This region has two important Tiger Conservation Units (TCUs), one comprising of the Manas Tiger Reserve, stretching across Bhutan to Arunachal Pradesh in the north-east, while the other includes Kaziranga in Assam and stretches upto Meghalaya. While the former is supposed to be the only landscape in south-Asia sustaining the phenomenon of tigers living close to the timber line and predated upon mountain ungulates, the latter encompasses the best preserved grassland habitat in the global tiger range (Wikramanayake et al. 1998). The region includes seven tiger reserves, viz., Buxa in Northern Bengal, Manas, Kaziranga and Nameri in Assam, Pakke and Namdapha in Arunachal Pradesh and Dampa in Mizoram. Several National Parks, Wildlife Sanctuaries, Reserved Forests and sacred groves are scattered across the landscape making it the largest connected forest landscape in India. Currently tiger occupancy was recorded from an area of 4,565 km² of forests within the Brahmaputra Valley and the North East Hills landscape, with an estimated population of about 143 (113 to 172) tigers. This area is recognised with high species diversity, high levels of endemism, taxonomic uniqueness of species, serious habitat loss and threatened status of the floral and faunal diversity of the area.

Most of this region today, is under intense tea cultivation with small isolated remnants of forests. The discovery of good tea growing areas in Assam made this region amongst the first to undergo extensive land-use changes with large areas being cleared out for tea cultivation on the banks of the Brahmaputra. Characterised by many islands and alluvial fertile soils, the region is under pressure from intense cultivation with high human densities. Sharing political boundaries with Nepal, Bhutan, China, Myanmar and Bangladesh make conservation a challenging task in this landscape and the need for trans-boundary International cooperation an essential requirement for conservation success. With 6.8% of its total land area under protected area network, this zone incorporates the highest diversity of species known from India, albeit the faunal abundances are low due to a high dependence of the local communities on bush-meat for subsistence and cultural reasons. Much of the prey is depleted in these forests as the hunter-gatherer tribes are efficient hunters and depend a lot on wild game for subsistence (Aiyadurai 2007). In addition, in recent years, most north-eastern states have been sites of intense political unrest resulting in differential development between states and within different regions of individual States.

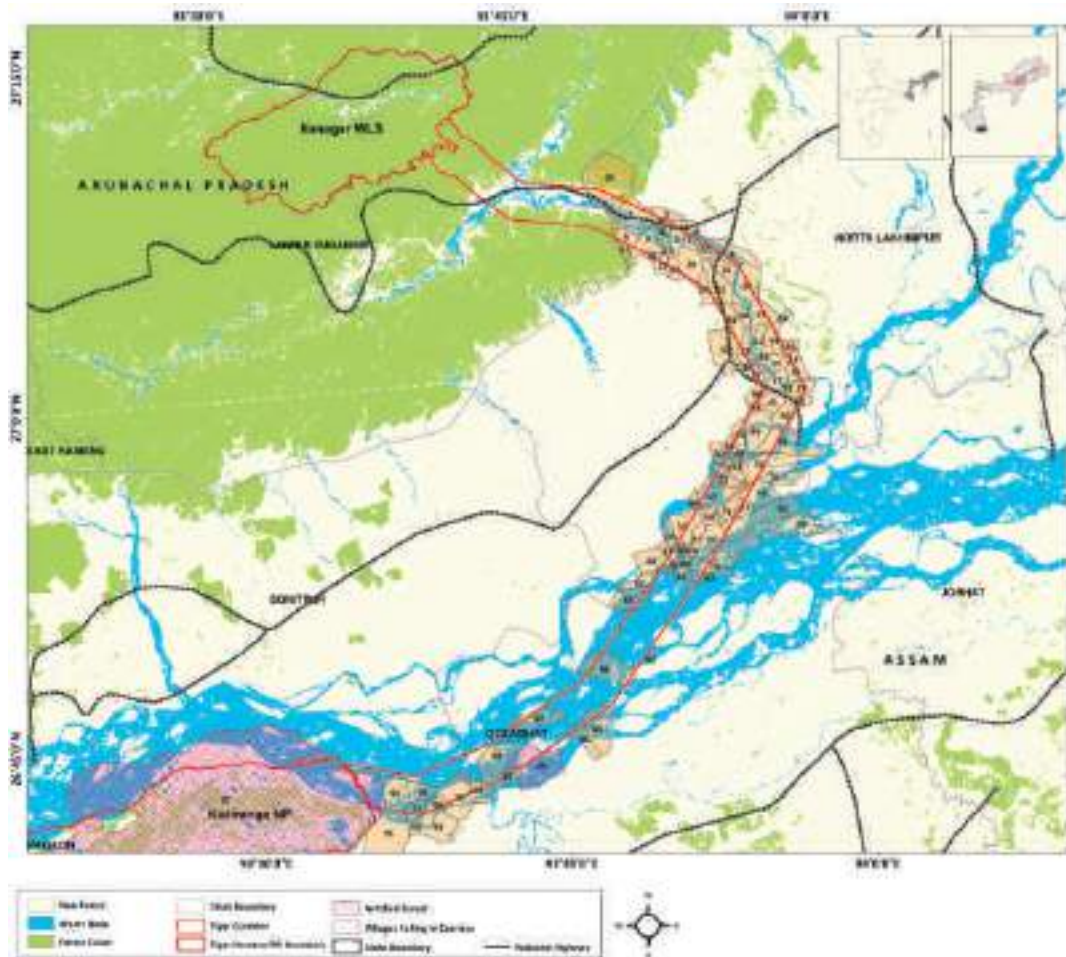


Figure 4.1:

Habitat Connectivity in North-Eastern Hills and Brahmaputra Landscape



KAZIRANGA TR WITH OTHER PROTECTED AREAS



This landscape holds the largest tiger population in the North-Eastern region consisting of about 125 tigers. The major source population of tigers in this landscape are in Kaziranga and Pakke in India and dispersing tigers from Bhutan and Myanmar. Kaziranga Tiger Reserve covers an area of 1,033 km² and includes the 859 km² Kaziranga National Park, 44 km² Burachapori and 70 km² Laokhowa Wildlife Sanctuaries. The National Park is located in Nagaon, Golaghat and Sonitpur districts, bounded in the north by the Brahmaputra and to the south, by the Karbi-Anglong Hills. It is connected to the southern parts of the North East Landscape via the Karbi-Anglong Hills, for which it acts as a major source. Further, Kaziranga is connected through the Karbi-Anglong Hills, to Intanki in the south. National Highway 37 separates it from the Karbi-Anglong hills where about 150 villages are located along this road, within the zone of influence of the Reserve. This connectivity through Karbi-Anglong is crucial for dispersal of tigers from their source population in Kaziranga. Kaziranga has lost its connectivity to the north (to Pakke) due to intensive agriculture on northern banks of the River Brahmaputra. The Kaziranga tiger population is contiguous with that of Orang Wildlife Sanctuary connected through island systems of the Brahmaputra. This is the single largest population in the North East Landscape consisting of about 125 tigers. The Kaziranga population connects with Nameri through riverine corridors which is an

Figure 4.2: Least Cost Pathway corridor for Tiger movement between Kaziranga-Itanagar WLS Corridor overlaid with village map (the village numbers are referenced in Table 4.1)

important connectivity maintaining gene flow between the plains and the hill population of tigers (in Arunachal Pradesh). This region being extremely fertile is in demand for agriculture and the Protected Areas are increasingly becoming isolated islands. In light of this the connectivity with Nameri in the North, Karbi Anglong in the South as well as the riverine islands, "stepping stones" through Laokhowa and Burachapori Wildlife Sanctuaries to Orang form the crucial elements for targeting conservation efforts. Large mammals from Kaziranga are also known to move between Karbi-Anglong hills and the Tiger Reserve, although protection of dispersing and migrating individuals is difficult

due to existence of political unrest in the Karbi region. Intanki National Park is also connected westwards through forests upto Balphakram National Park. This landscape has contiguous forest across the international border with Myanmar. The weak links in this landscape are the forests in the districts of Mon, Mokok Chung, Tuensang, Zuheboto, Wokha, and Pekh in the east. The landscape between Balphakram National Park and Intaki National Park through the districts of Karbi-Anglong, West Khasi Hills, East Khasi Hills and East and West Garo Hills is fragmented.

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Assam	Lakhimpur	Bihpuria	Merbeel	142	851	174	934
2			Bihpuria	Harmutty Gaon	314	1760	470	2255
3			Bihpuria	Pachoni Bogori	21	110	55	266
4			Bihpuria	Lakhonabari	63	351	77	381
5			Bihpuria	Merbeel Dighali	46	302	46	258
6			Bihpuria	Aunishbari 8/11	201	1151	236	1221
7			Bihpuria	Parbotipur Gaon	41	253	46	243
8			Bihpuria	Bangalmora Grazing Ground	520	2719	971	4857
9			Bihpuria	Parbotipur N.C.	664	3236	511	2289
10			Narayanpur	Pithaguri No.4	55	334	57	284
11			Narayanpur	Pithaguri No.2	100	470	38	179
12			Bihpuria	Bango Gaon	213	1232	205	1094
13			Narayanpur	Pithaguri No.1	35	229	53	266
14			Bihpuria	Dongibeel	255	1418	385	1966
15			North Lakhimpur	Merbeel Gt. No. 81/78	NA	NA	NA	NA
16			Bihpuria	Laholial Gaon	65	373	78	384
17			Bihpuria	Bangaligaon	175	1005	272	1405
18			North Lakhimpur	Harmutty Gt. No.95 F.C.	NA	NA	NA	NA
19			Bihpuria	Chichapathar	234	1196	267	1282
20			Bihpuria	Kandali Gaon	59	321	77	395

Table 4.1:
Villages within the Least Cost Pathway Corridor between Kaziranga-Iltanagar WLS as shown in Fig. 4.2

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
21			North Lakhimpur	Rajgarh	NA	NA	276	1277
22			North Lakhimpur	Holmari Grant No.65/68	NA	NA	NA	NA
23			North Lakhimpur	Pithaguri No.5	NA	NA	NA	NA
24			North Lakhimpur	Holmari Grant No.80 Fs	NA	NA	NA	NA
25			North Lakhimpur	Hoimari No.79/87 Nlr	NA	NA	NA	NA
26			North Lakhimpur	Gerelua	NA	NA	NA	NA.
27			Bihpuria	Kalabil Mornoi Nepali	271	1356	254	1186
28			Bihpuria	Mornoi Gaon	371	2067	526	2773
29			Bihpuria	Keyamora	263	1423	289	1493
30			Bihpuria	Chintaoligaon	40	227	43	190
31			Bihpuria	Santapur Gaon	171	907	247	1218
32			Bihpuria	Bihpuria	NA	NA	NA	NA
33			Bihpuria	Gondhia Gaon No.2	55	323	69	366
34			Bihpuria	Gondhia Gaon	75	413	Na	Na
35			Bihpuria	Pokadol Grant	19	116	17	90
36			Bihpuria	Bihpuria Gaon	52	253	68	316
37			Bihpuria	Bengenati Grant	93	506	115	548
38			Bihpuria	Modhupur	12	71	15	71
39			Bihpuria	Pokadol Pathar	70	429	97	507
40			Bihpuria	Bangaligaon No.2	9	42	3	9
41			Bihpuria	Nepali Gaon	123	628	150	645
42			Bihpuria	Arunachal	84	501	104	491
43			Bihpuria	Japjup	49	266	60	264
44			Bihpuria	Badati Jamuguri	75	369	101	492
45			Bihpuria	Kenduguri	143	705	388	1721
46			Bihpuria	Badati Miri	260	1810	300	1775
47			Narayanpur	Mazor Chapori	104	755	129	744
48			Narayanpur	Sonaribari Block 3	41	279	4	19
49			Narayanpur	Sonaribari Block 2	6	41	50	363
50			Narayanpur	Dhanguloi Pathar	68	492	10	44





Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
51			Narayanpur	Sonaribari Block 1	3	10	18	110
52			Narayanpur	Sonaribari	3	17	Na	Na
53			Narayanpur	Dikrongmukh	11	93	35	222
54			Narayanpur	Chayang N.c.	44	344	64	401
55			Narayanpur	Borbil	50	393	98	725
56			Narayanpur	Banornlukh N.c.	33	268	49	379
57			Narayanpur	Borbil Mazgaon	60	477	0	0
58			Narayanpur	Kongbong N.c.	21	174	42	258
59			Narayanpur	Bothakhona No.2	58	482	84	548
60			Narayanpur	Borbeel N.c.	30	276	21	183
61			Narayanpur	Jamuguri	141	898	59	330
62			Narayanpur	Borati N.c.	66	573	58	394
63			Narayanpur	Atua Chapori	5	48	7	54
64			North Lakhimpur	Kandali Pathar	Na	Na	Na	Na
65			North Lakhimpur	Kachikata Pathar	Na	Na	Na	Na
66			North Lakhimpur	Meromukh N.c.	Na	Na	Na	Na
67			North Lakhimpur	Patri N.c.	Na	Na	Na	Na
68		Golaghat	Khumtai	Alani Chapori	214	1143	230	1115
69			Bokakhat	Mariahola	10	58	28	200
70			Bokakhat	Dighali Ati	64	353	85	463
71			Bokakhat	Bezgaon	3	21	66	329
72			Golaghat	Gahorighat PG.R.	NA	NA	NA	NA
73			Golaghat	Namghuria Gaon	NA	NA	NA	NA
74			Golaghat	Dadhora Gaon	NA	NA	NA	NA
75			Golaghat	Sakala Satra	NA	NA	NA	NA
76			Golaghat	Dalajjarani	NA	NA	NA	NA
77			Golaghat	Lohkor Pathar Chapori	NA	NA	NA	NA
78			Golaghat	Phalengi	NA	NA	NA	NA
79			Golaghat	Gatanga Chapori	NA	NA	NA	NA
80			Golaghat	Barfakua	NA	NA	NA	NA

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
81			Golaghat	Rangamuri	NA	NA	NA	NA
82			Golaghat	Namati	NA	NA	150	786
83			Golaghat	Hutar Gaon	NA	NA	NA	NA
84			Golaghat	Bakuli Chapori No.2	NA	NA	NA	NA
85			Golaghat	Majdolapa	NA	NA	NA	NA
86			Golaghat	Bakuli Chapori No.1	NA	NA	NA	NA
87			Golaghat	Bhalukaguri	NA	NA	NA	NA
88			Golaghat	Borbali	NA	NA	230	1105
89			Golaghat	Chowguri Chapori	NA	NA	NA	NA
90			Golaghat	Nowbhang	NA	NA	NA	NA
91			Golaghat	Bamungaon N.C.	NA	NA	NA	NA
92			Golaghat	Bilotia Gaon	NA	NA	NA	NA
93			Bokakhat	Jogania Ati	107	512	137	625
94			Bokakhat	Palashguri	142	805	241	1221
95			Golaghat	Bohikhowa	NA	NA	NA	NA

Kaziranga-Itanagar WLS Corridor

Habitat size	155799 Km ²
Source Population	Kaziranga
Size of Source	106 (81-131) tigers in 800 Km ²
Protected Areas	Kaziranga TR Itanagar WLS
Corridors	Kaziranga TR-Itanagar WLS Corridor



Figure 4.3:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kaziranga-Itanagar WLS



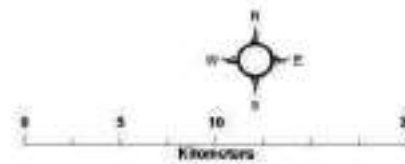
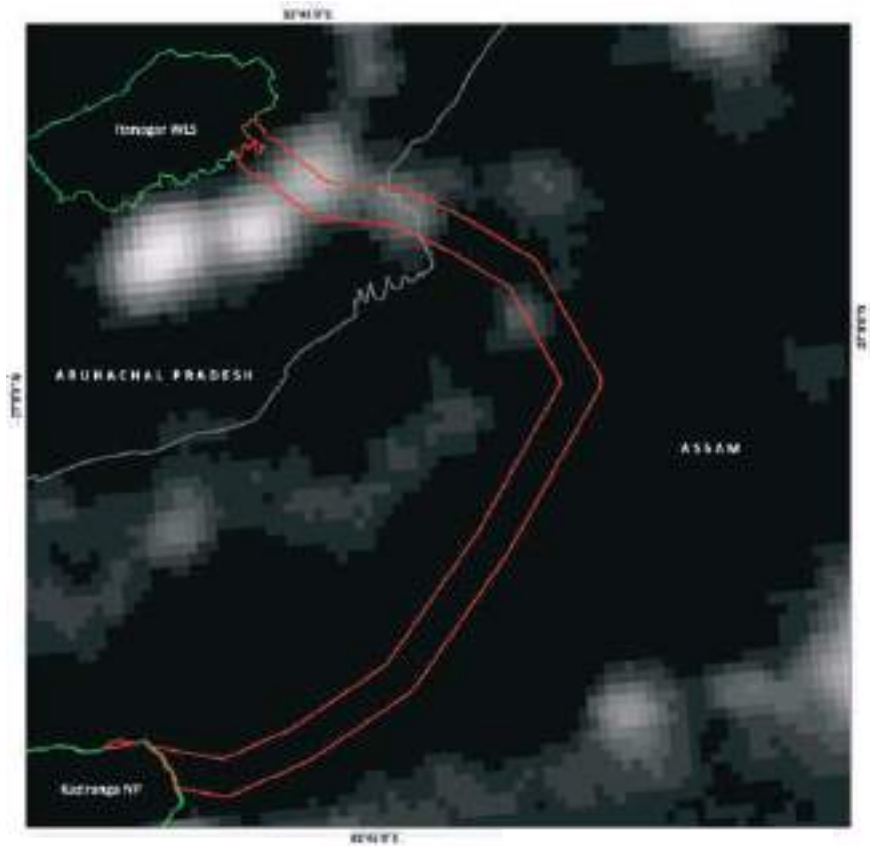
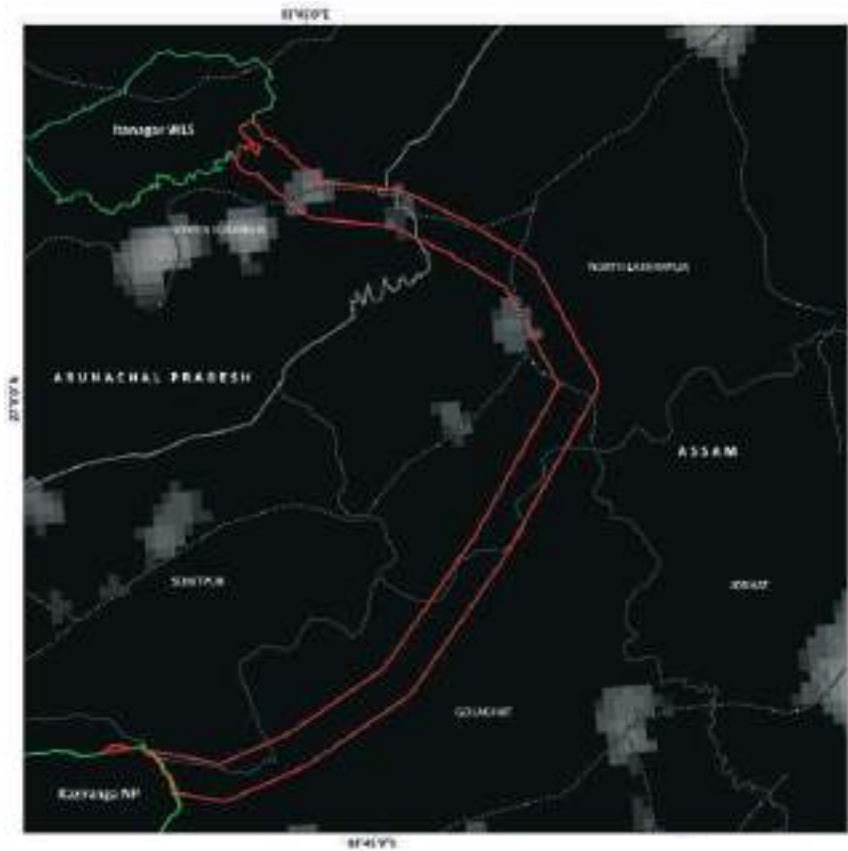
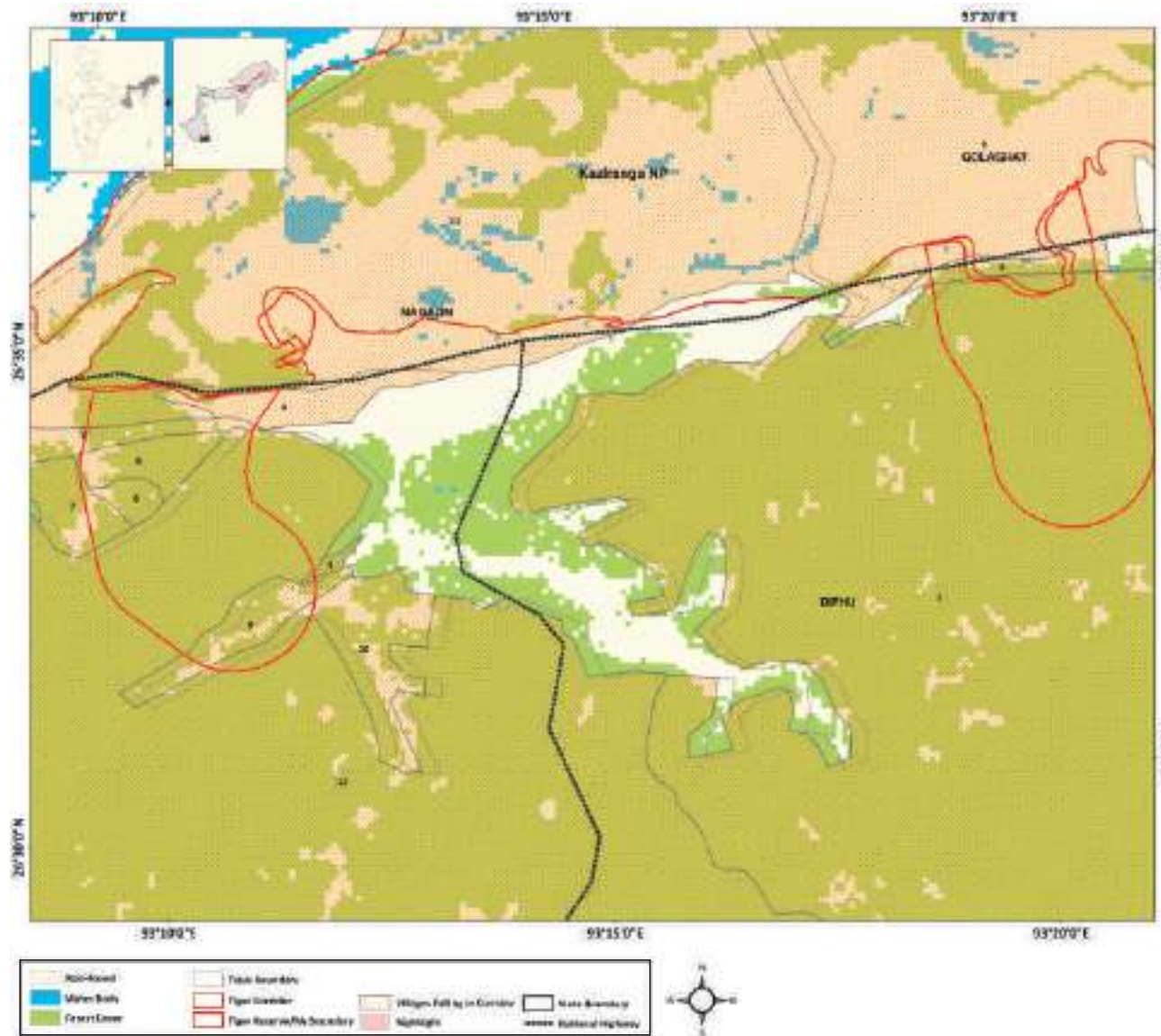


Figure 4.4: Human habitation as depicted by nightlights within the Kaziranga-Itanagar WLS landscape in the year 1992 and 2012

Figure 4.5:

Least Cost Pathway corridor for Tiger movement between Kaziranga-Karbi-Anlong Corridor overlaid with village map (the village numbers are referenced in Table 4.2)



Kaziranga-Karbi-Anglong Corridor

Habitat size	155799 Km ²
Source Population	Kaziranga
Size of Source	106 (81-131) tigers in 800 Km ²
Protected Areas	Kaziranga TR Karbi-Anglong WLS
Corridors	Kaziranga-Karbi Anglong1 Kaziranga-Karbi Anglong2

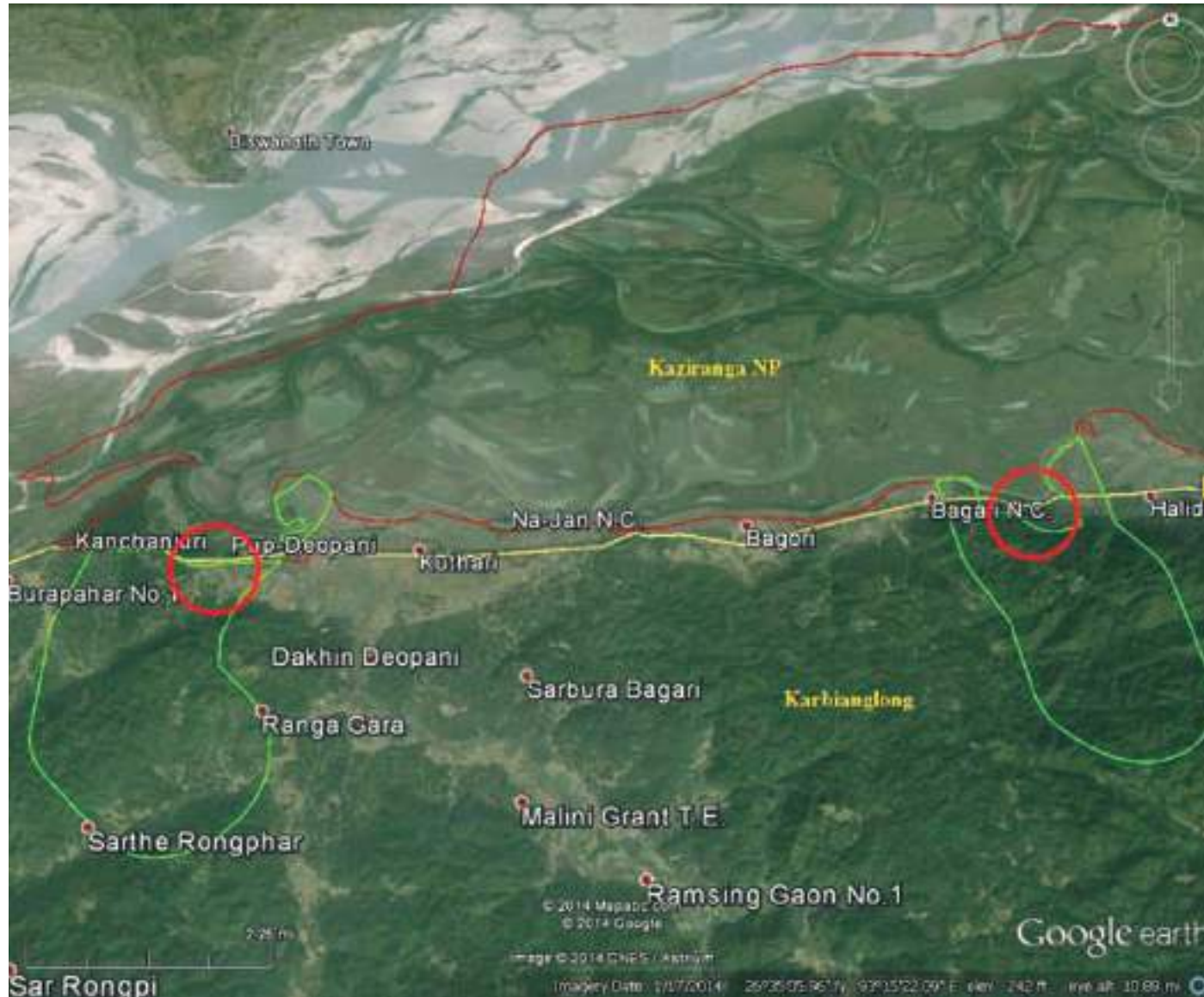
Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Assam	Karbi Anglong		Bokajan	NA	NA	NA	NA
2		Golaghat	Bokakhat	Haladhibari	76	389	84	413
3		Nagaon	Kaliabor	Deopani	80	480	155	832
4		Nagaon	Kaliabor	Bandardubi	149	1009	224	1286
5		Nagaon	Kaliabor	Kalapanimukh	7	35	8	46
6		Nagaon	Kaliabor	Kanchanjuri	82	425	59	248
7		Nagaon	Kaliabor	Silimkhowa	75	378	117	619
8		Nagaon	Kaliabor	Injaygaon	17	105	25	128
9		Nagaon	Kaliabor	Rangagara	2	14	189	975
10		Nagaon	Kaliabor	Krogaon	45	236	NA	NA
11		Nagaon	Kaliabor	Bhokuamari	261	1621	391	2169
12		Karbi Anglong	Diphu	Hora Ghat	NA	NA	NA	NA



Table 4.2: Villages within the Least Cost Pathway Corridor between Kaziranga-Karbianglong as shown in Fig. 4.5

Figure 4.6:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kaziranga-Karbi-Anglong



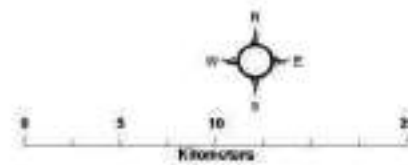
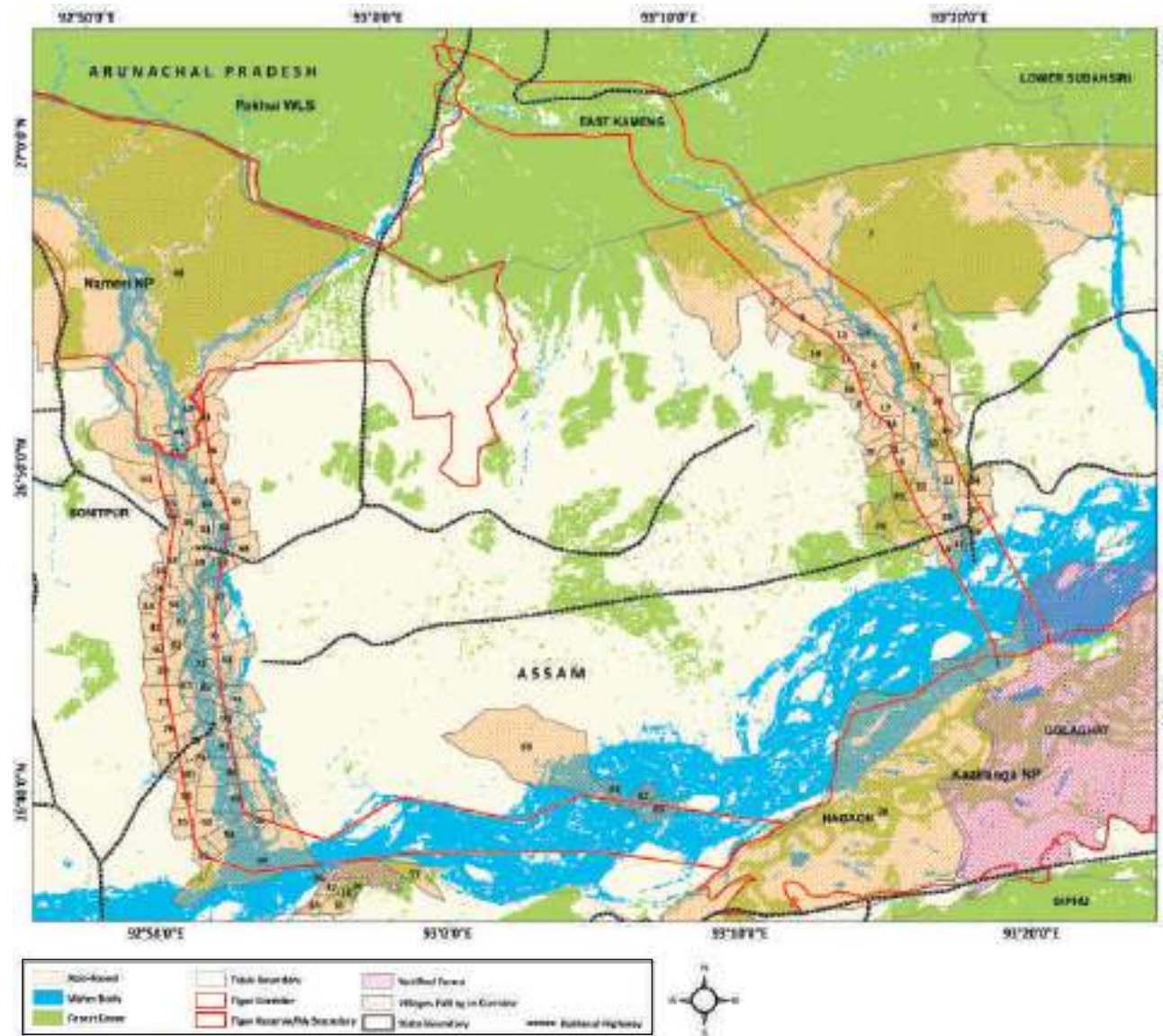


Figure 4.7:
Human habitation as depicted by nightlights within the Kaziranga-Karbi-Anglong landscape in the year 1992 and 2012

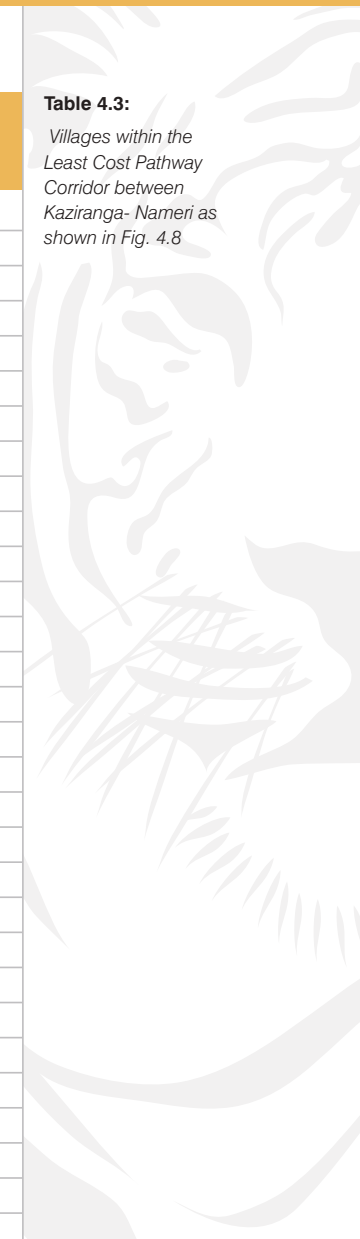
Figure 4.8.:

Least Cost Pathway corridor for Tiger movement between Kaziranga- Nameri Corridor overlaid with village map (the village numbers are referenced in Table 4.3)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
33	Assam	Nagaon	Kaliabor	Hatimura No.2	39	167	53	227
34			Kaliabor	Joysagar No.2	42	211	37	177
35			Kaliabor	Kamakhya Gaon	264	1153	321	1379
36			Nagaon	Kurchimari	NA	NA	NA	NA
37			Nagaon	Bihdubi No.2	NA	NA	NA	NA
38			Nagaon	Silikhaguri	NA	NA	NA	NA
39			Kaliabor	Bhokumari	261	1621	391	2169
40		Sonitpur	Chariduar	Charduar	315	1516	620	4150
41			Na-Duar	Bardikarai No.2	359	2048	403	2083
42			Sonitpur	Bardikarai Balichapari	NA	NA	NA	NA
43			Chariduar	Berajon	119	627	255	1299
44			Na-Duar	Purani Bardikarai	41	260	91	462
45			Na-Duar	Bardikarai Miri Gaon	175	1111	212	1116
46			Na-Duar	Gorbil	130	810	150	752
47			Na-Duar	Patgaon N.C.	44	273	63	319
48			Na-Duar	Bamun Gaon	116	663	Na	Na
49			Na-Duar	Nabil	320	1669	421	1891
50			Na-Duar	Bagabil	217	1106	245	1110
51			Na-Duar	Tarajan	17	95	Na	Na
52			Chariduar	Goraligaon	65	365	107	550
53			Na-Duar	Chamdharma	106	540	108	512
54			Chariduar	Tinigharia Miri	127	731	156	781
55			Tezpur	Tengabasti	214	1166	324	1647
56			Chariduar	Kekokali Bangali	38	211	53	277
57			Na-Duar	Karaiani Chapari	523	3161	752	4098
58			Chariduar	Kekokali Miri	45	243	62	281
59			Chariduar	Singatali	570	2997	498	2473
60			Chariduar	Rajgarh	233	1213	276	1277
61			Na-Duar	Ghazi Bezgaon	40	207	79	341
62			Chariduar	Karaibari	52	313	42	195

Table 4.3:
Villages within the
Least Cost Pathway
Corridor between
Kaziranga- Nameri as
shown in Fig. 4.8





Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
63			Sonitpur	Kalabari Gaon	NA	NA	NA	NA
64			Sonitpur	Tanbhangi Pathar	NA	NA	NA	NA
65			Sonitpur	Baligaon N.C.	NA	NA	NA	NA
66			Sonitpur	Miri Pathar No.2	NA	NA	NA	NA
67			Sonitpur	Bokagaon N.C.	NA	NA	NA	NA
68			Sonitpur	Bormata	NA	NA	NA	NA
69			Sonitpur	Dafalagarh	NA	NA	NA	NA
70			Sonitpur	Mahajan Chapari	NA	NA	NA	NA
71			Sonitpur	Bharali Chapari N.C.	NA	NA	NA	NA
72			Na-Duar	Bharali Chapari	76	408	117	613
73			Chariduar	Borghat Gaon	411	2322	657	3960
74			Na-Duar	Goalgaon	92	490	486	2324
75			Na-Duar	Chankighat Block	64	329	190	980
76			Chariduar	Karkani	380	2365	405	2113
77			Chariduar	Chamdara	307	1865	108	512
78			Chariduar	Bhiagaon	129	734	149	775
79			Tezpur	Gorsinga Bihia	292	1773	397	2162
80			Tezpur	Alisinga	75	400	16	70
81			Sonitpur	Singrimari Gaon	NA	NA	NA	NA
82			Sonitpur	Balosutigaon	NA	NA	NA	NA
83			Sonitpur	Jowani	NA	NA	NA	NA
84			Tezpur	Marisuti N.c.	28	175	33	210
85			Tezpur	Karaiani Nepali	347	2207	540	2880
86			Sonitpur	Makua N.C.	NA	NA	NA	NA
87			Sonitpur	Gataimara N.C.	NA	NA	NA	NA
88			Sonitpur	Gataimara	NA	NA	NA	NA
89			Sonitpur	Bhojmari	NA	NA	NA	NA
90			Sonitpur	Chiruani Chapari Pgr	NA	NA	NA	NA
91			Sonitpur	Gorsinga Biching N.C.	NA	NA	NA	NA
92			Sonitpur	Karaiani Nepali N.C.	NA	NA	NA	NA

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
93			Sonitpur	Tengakhuti	NA	NA	NA	NA
94			Sonitpur	Jorgarh N.C.	NA	NA	NA	NA
95			Sonitpur	Chiruani N.C.	NA	NA	NA	NA
96			Sonitpur	Rabarbari	NA	NA	NA	NA

Kaziranga-Nameri Corridor

Habitat size	155799 Km ²
Source Population	Kaziranga
Size of Source	106 (81-131) tigers in 800 Km ²
Protected Areas	Kaziranga TR Nameri TR
Corridors	Kaziranga-Nameri1 Kaziranga-Nameri2

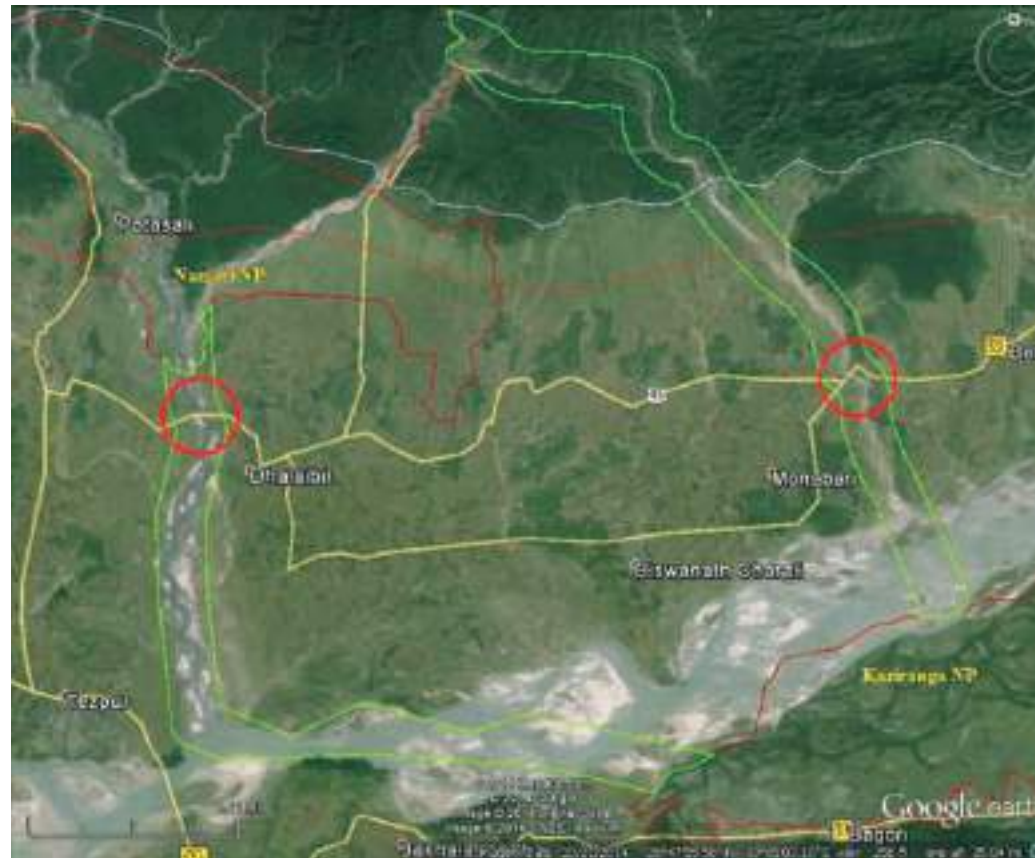


Figure 4.9:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kaziranga-Nameri

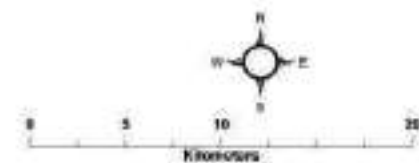
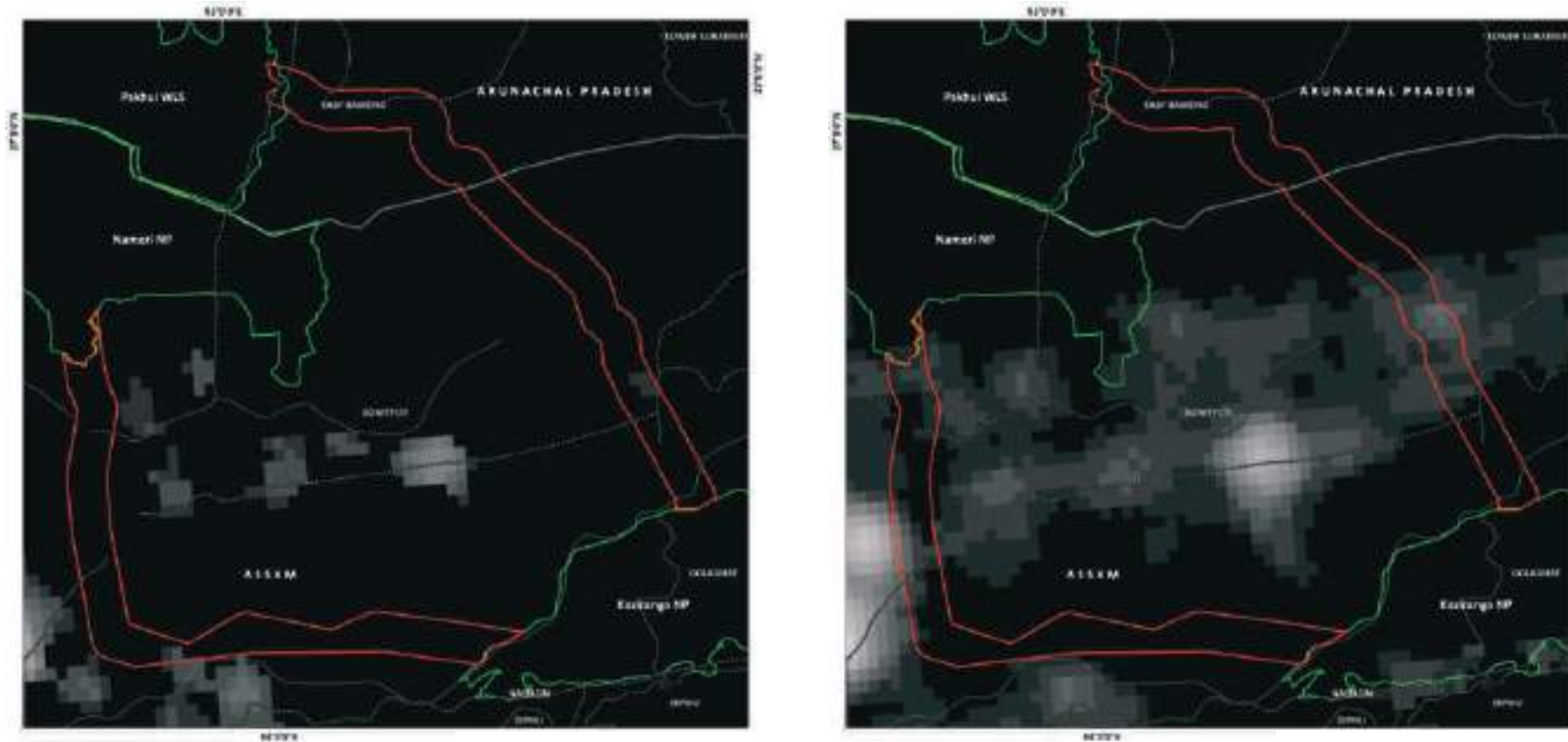


Figure 4.10:
Human habitation as depicted by nightlights within the Kaziranga-Nameri landscape in the year 1992 and 2012

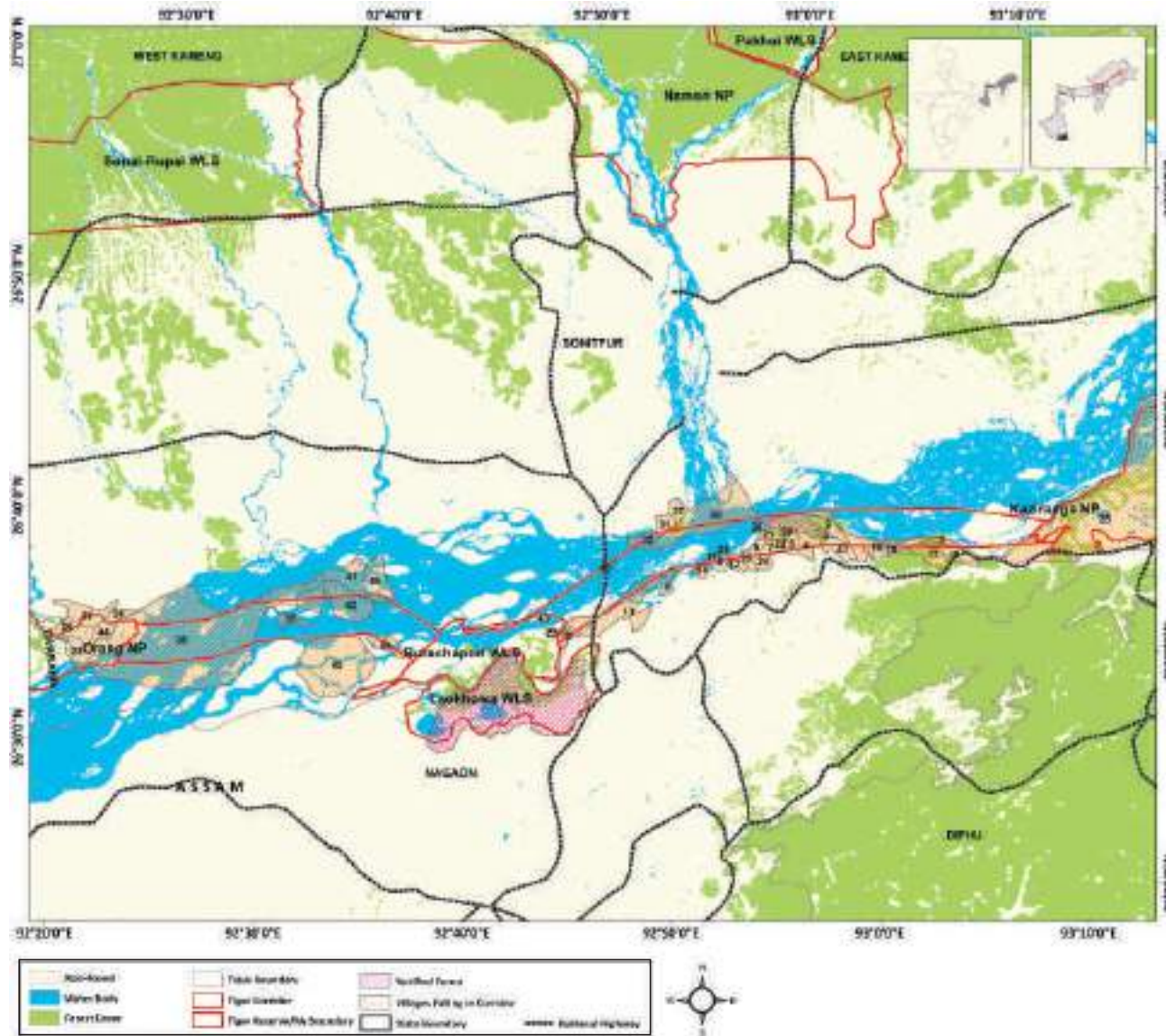


Figure 4.11:
Least Cost Pathway corridor for Tiger movement between Kaziranga-Orang Corridor overlaid with village map (the village numbers are referenced in Table 4.4)

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Assam	Nagaon	Kaliabor	Bhokuamari	261	1621	391	2169
2			Kaliabor	Hatimura No.2	39	167	53	227
3			Kaliabor	Hatimura No.1	61	298	38	185
4			Kaliabor	Dakhinpat	169	750	208	934
5			Kaliabor	Sonarigaon	105	511	Na	Na
6			Kaliabor	Joysagar No.2	42	211	37	177
7			Kaliabor	Kamakhyaogaon	264	1153	321	1379
8			Kaliabor	Bihdubi No.1	129	561	136	552
9			Kaliabor	Bhurbandha No.2	174	894	283	1409
10			Kaliabor	Silghat Gaon	186	969	229	1029
11			Kaliabor	Bihdubi No.3	18	98	68	381
12			Kaliabor	Samdhora	326	1683	368	1492
13			Nagaon	Bhurbondha N.C.	NA	NA	NA	NA
14			Kaliabor	Gakhirakhati No.4	146	977	142	725
15			Rupahi	Bogamukh No.3	4	27	41	233
16			Nagaon	Kalangmukh P.G.R.	NA	NA	NA	NA
17			Nagaon	Jamuguri No.1	NA	NA	NA	NA
18			Nagaon	Deochur No.1	NA	NA	NA	NA
19			Nagaon	Barghop No.1	NA	NA	NA	NA
20			Nagaon	Kurchimari	NA	NA	NA	NA
21			Nagaon	Bihdubi No.2	NA	NA	NA	NA
22			Nagaon	Silikhaguri	NA	NA	NA	NA
23			Nagaon	Saguri	NA	NA	NA	NA
24			Nagaon	Joysagar No.1	NA	NA	NA	NA
25			Kaliabor	Bhokuamari	261	1621	391	2169
26		Sonitpur	Dhekiajuli	Nichalamari Chapari	168	888	210	1074
27			Sonitpur	Borbhagia	NA	NA	NA	NA
28			Sonitpur	Sishuati	NA	NA	NA	NA
29			Sonitpur	Kochumara Chapari	NA	NA	NA	NA
30			Tezpur	Marisuti N.C.	28	175	33	210

Table 4.4:
Villages within the Least Cost Pathway Corridor between Kaziranga-Orang as shown in Fig. 4.11

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
31		Sonitpur	Tezpur	Rajbhoral	287	1719	455	2378
32			Tezpur	Bhomoraguri	321	1930	226	1150
33			Dhekiajuli	Belsiri Chapori N.C.	1	4	8	43
34			Sonitpur	Hatibari Gaon	NA	NA	NA	NA
35			Sonitpur	Kaniya Tapu	NA	NA	NA	NA
36			Sonitpur	Borsola Pgr	NA	NA	NA	NA
37			Sonitpur	Chiruani N.C.	NA	NA	NA	NA
38			Sonitpur	Rabarbari	NA	NA	NA	NA
39			Sonitpur	Bihdubi No.2	NA	NA	NA	NA
40			Sonitpur	Sutartapa	NA	NA	NA	NA
41			Sonitpur	Dhaka Tapu	NA	NA	NA	NA
42			Sonitpur	Kosmara Pgr	NA	NA	NA	NA
43			Sonitpur	Dhania	NA	NA	NA	NA
44			Sonitpur	Belsiri Chapori	NA	NA	NA	NA
45			Sonitpur	Arna Chapori	NA	NA	NA	NA
46			Sonitpur	Batulibil	NA	NA	NA	NA

Kaziranga-Orang Corridor

Habitat size	155799 Km ²
Source Population	Kaziranga
Size of Source	106 (81-131) tigers in 800 Km ²
Protected Areas	Kaziranga TR
	Orang NP
Corridors	KazirangaTR-Orang NP Corridor

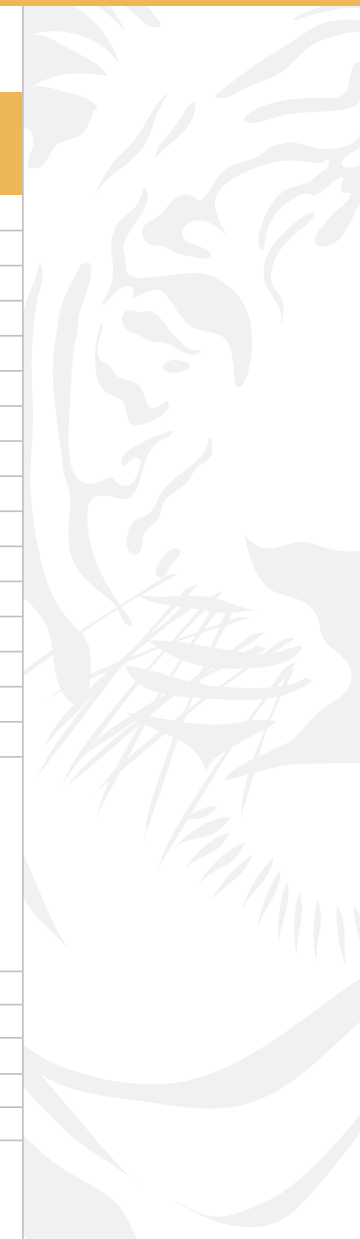


Figure 4.12:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kaziranga-Orang



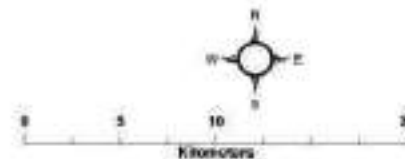
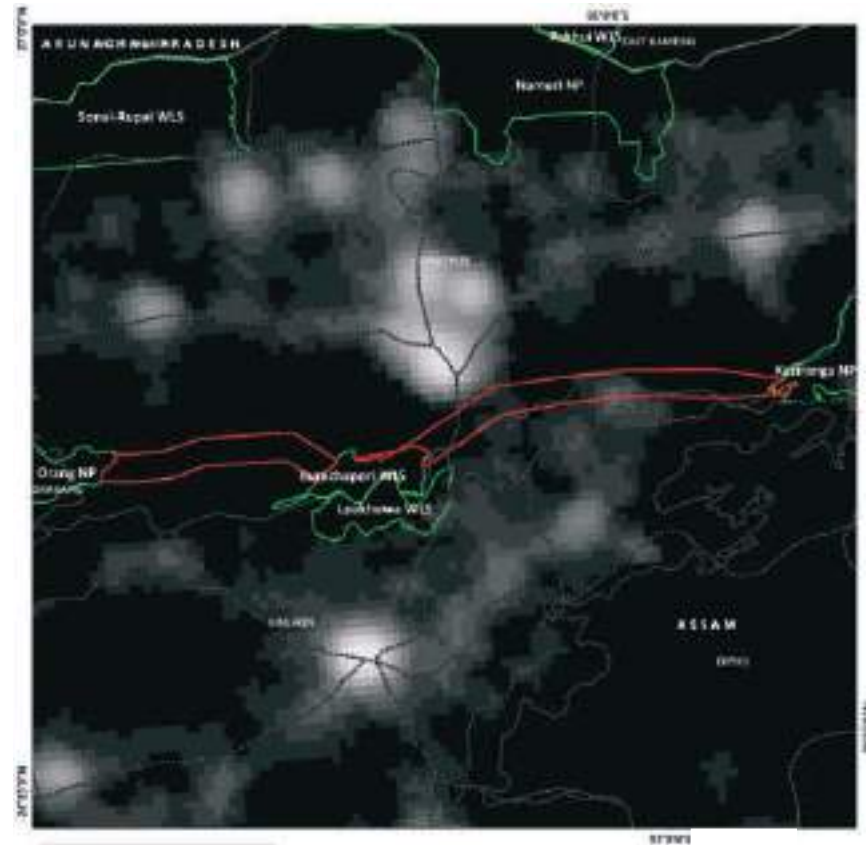
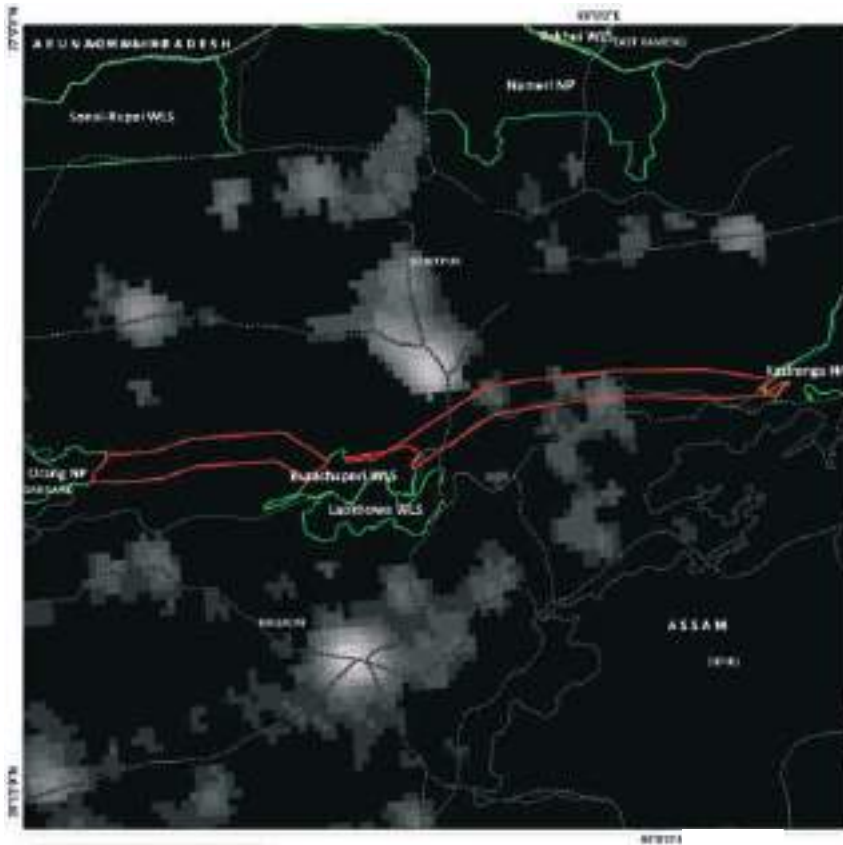
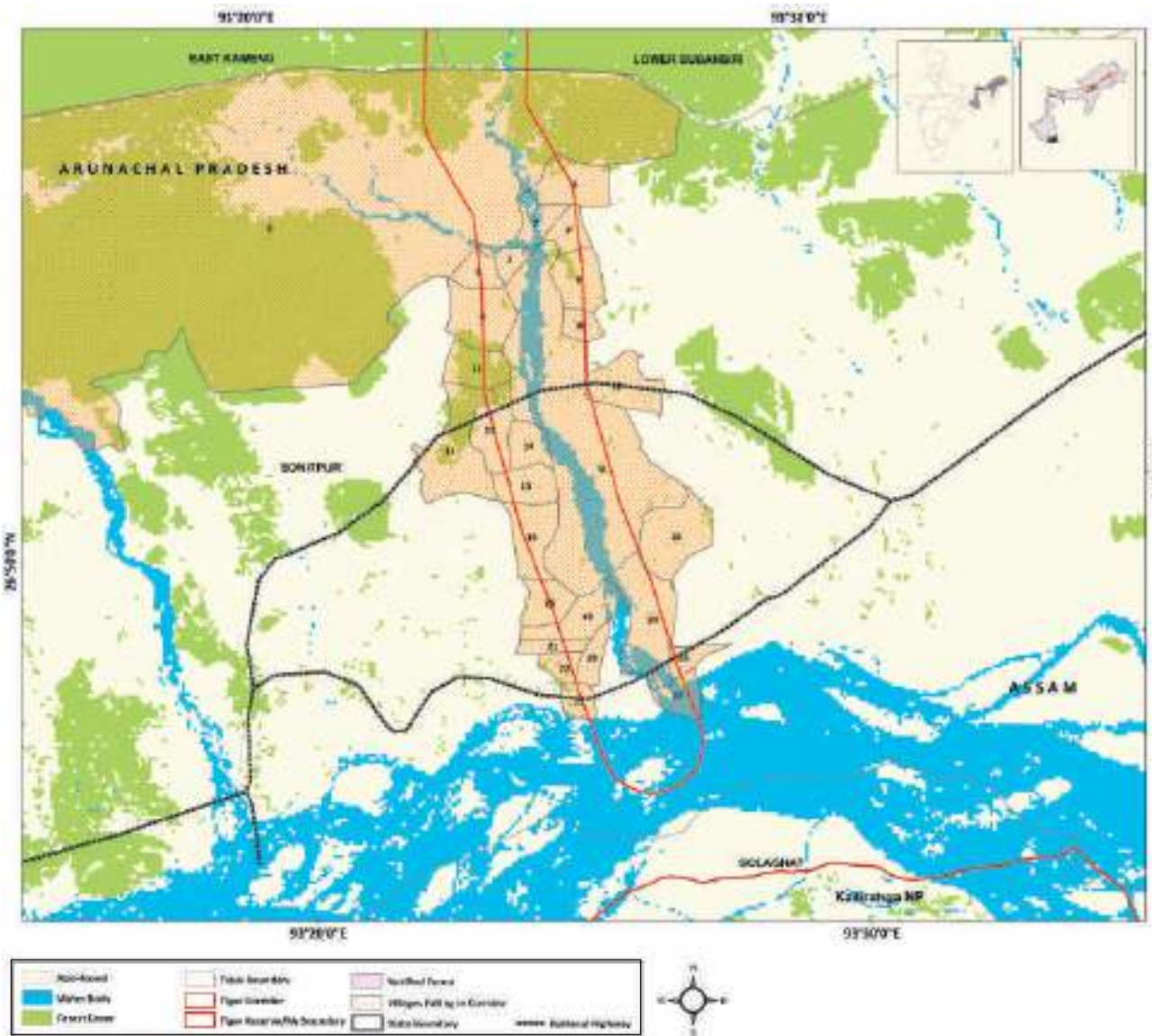


Figure 4.13:
Human habitation as depicted by nightlights within the Kaziranga-Orang landscape in the year 1992 and 2012

Figure 4.14:

Least Cost Pathway corridor for Tiger movement between Kaziranga-Papumpare Corridor overlaid with village map (the village numbers are referenced in Table 5)



Village_ID	State	District	Tehsil	Village	No of Household	Total Population	No (in hactares)
1	Assam	Sonitpur	Biswanath	Bihmari N.C.(Part)	129	696	136.00
2			Sonitpur	Karibill Bangali	NA	NA	NA
3			Biswanath	Bihmari	263	1509	136.00
4			Biswanath	Lalpukhuri	118	581	241.00
5			Sonitpur	North Guhati	NA	NA	NA
6			Sonitpur	Karibill Gaon	NA	NA	NA
7			Sonitpur	Dullung N.C.	NA	NA	NA
8			Sonitpur	Takawbari Gaon	NA	NA	NA
9			Sonitpur	Bholuadanga	NA	NA	NA
10			Sonitpur	Karibill Chapari	NA	NA	NA
11			Biswanath	Barajuli T.e.	200	1040	233.00
12			Biswanath	Nashbar	313	1545	265.00
13			Biswanath	Bedeti Pathar	81	434	164.00
14			Biswanath	Barajuli Pathar	63	286	141.00
15			Biswanath	Barajuli Gaon (part)	207	1093	180.00
16			Biswanath	Barajuli Nepali	258	1200	253.00
17			Sonitpur	Rangajan	NA	NA	NA
18			Sonitpur	Leptapara	NA	NA	NA
19			Biswanath	Batiamari N.c.2	153	815	220.00
20			Biswanath	Batiamari Pgr (part)	98	514	172.00
21			Biswanath	Batiamari N.c.3	155	814	172.00
22			Biswanath	Batiamari N.c.5	85	397	145.00
23			Biswanath	Roumari Gaon	65	326	87.00
24			Sonitpur	Burai N.C.	NA	NA	NA
25			Sonitpur	Batiamari N.C.1	NA	NA	NA
26			Sonitpur	Barhatiguri	NA	NA	NA
27			Sonitpur	Buraight Lower	NA	NA	NA

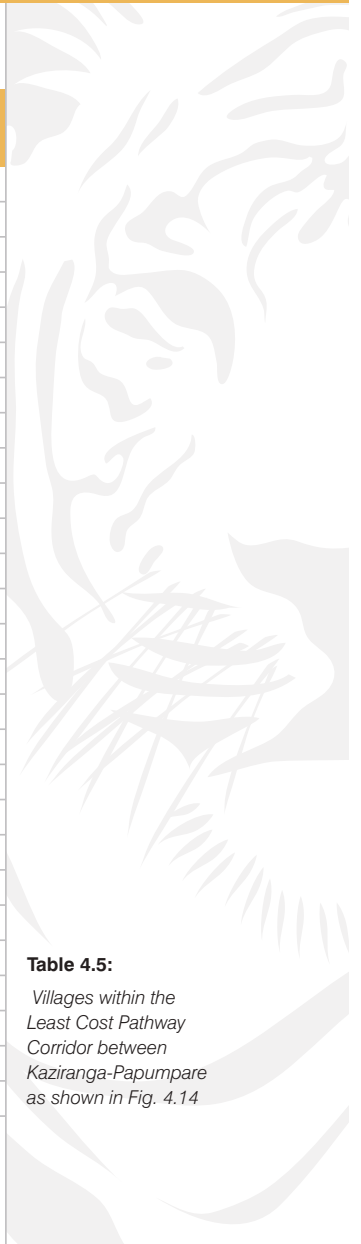
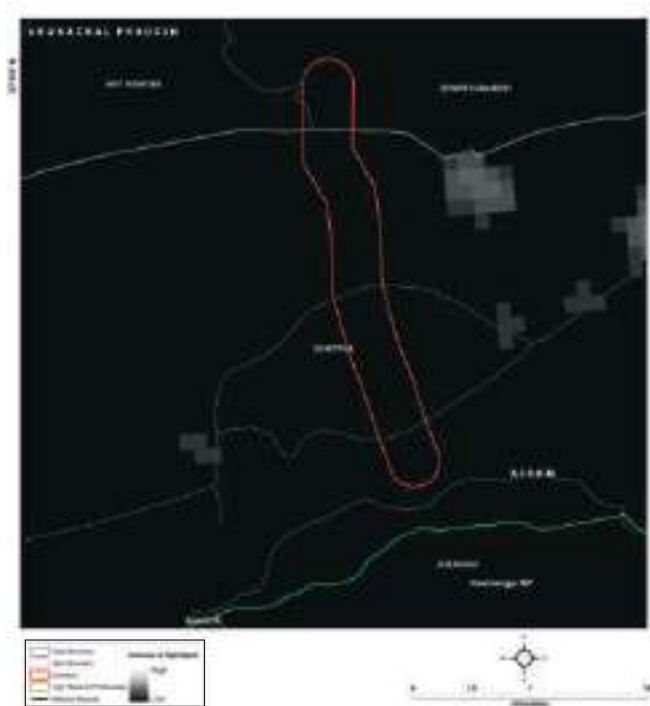


Table 4.5:
Villages within the
Least Cost Pathway
Corridor between
Kaziranga-Papumpare
as shown in Fig. 4.14

Figure 4.15:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kaziranga-Papumpare





Manas Tiger Reserve spans across the districts of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darrang in north-west Assam, covering an area of 2,837 km² of which 470 km² is designated as the core area. To the north, it is separated from the Royal Manas National Park of Bhutan by River Manas and its tributaries- Beki and Hakua; while to the west, it is separated from the Buxa Tiger Reserve of West Bengal by River Sankosh. Around 62 villages are located within two kilometres of the Reserve boundary between rivers Sankosh and Dhansiri. The region is affected by high levels of extremist activities, thus making conservation and scientific monitoring in the area a challenge. The Reserve Ripu Chirang Elephant Reserve within the Bhutan Biological Conservation Complex, in Bhutan is connected with the forests of Buxa in West Bengal, thus making a large transboundary conservation area. The entire area inclusive of the Bor Nadi Sanctuary

in Assam covers an area of 7,200 km². Manas Tiger Reserve was camera trapped and tiger density is estimated to be 1.8 tiger per 100 km². However, the region has higher potential and is on its path to recovery. With control of poaching of prey, tiger densities are likely to increase substantially, especially in the southern parts of Manas.



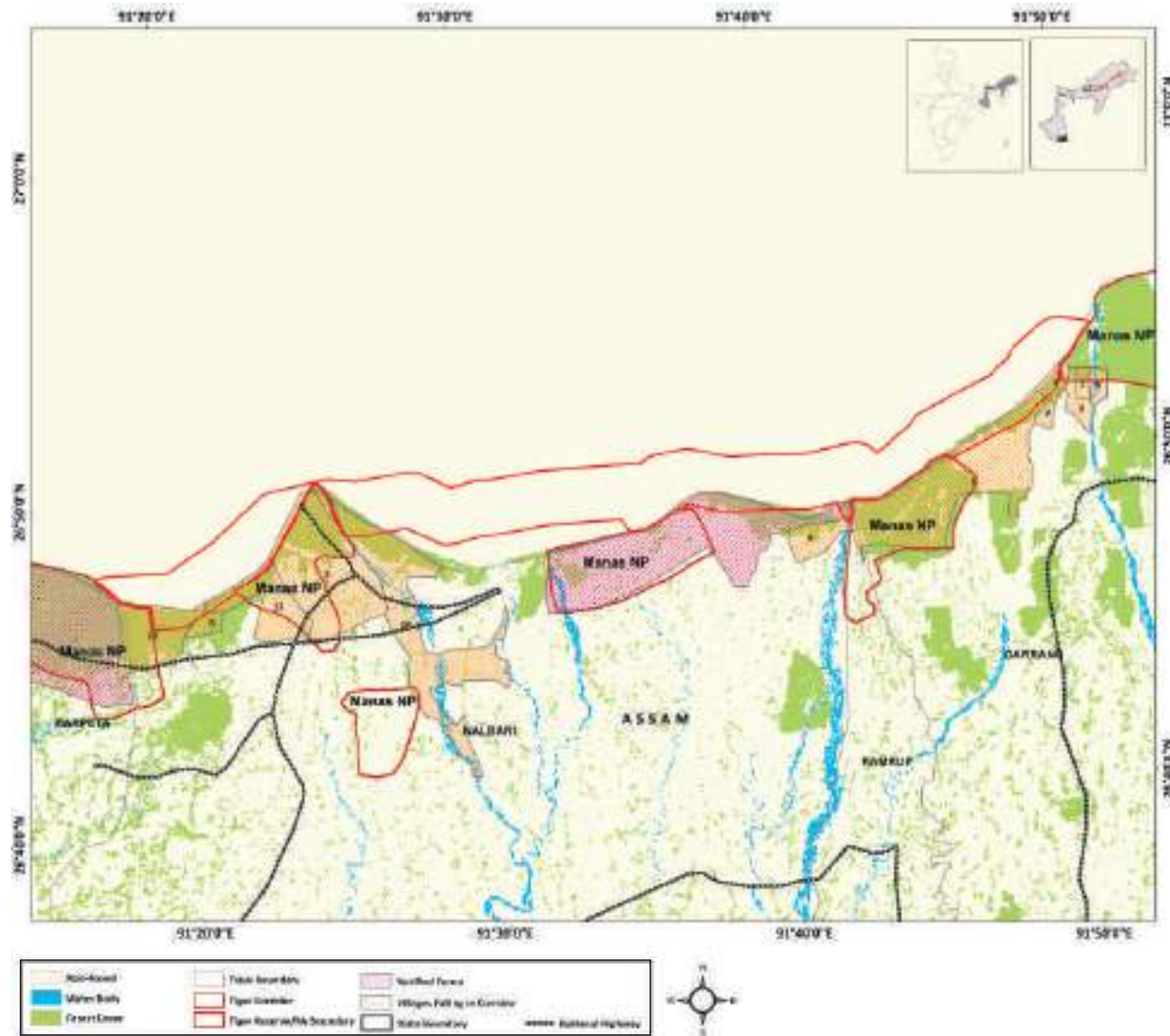
Figure 4.16:
Human habitation as depicted by nightlights within the Kaziranga-Papumpare landscape in the year 1992 and 2012

Kaziranga-Papumpare Corridor

Habitat size	155799 Km ²
Source Population	Kaziranga
Size of Source	106 (81-131) tigers in 800 Km ²
Protected Areas	Kaziranga
Corridors	Kaziranga-Papumpare Corridor

Figure 4.17:

Least Cost Pathway corridor for Tiger movement between Manas Corridor overlaid with village map (the village numbers are referenced in Table 4.6)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	Assam	Darrang	Harisinga	Bhutijhar N.c.	37	261	47	268
2			Harisinga	Newli No.1	9	59	8	33
3			Darrang	Chamrang N.C.	NA	NA	NA	NA
4			Darrang	Newli Block N.C.	NA	NA	NA	NA
5			Darrang	Sagunbari N.C.	NA	NA	NA	NA
6			Darrang	Suklai Khuti Bagan N.C.	NA	NA	NA	NA
7		Nalbari	Baska	Dihira	136	794	219	1240
8			Tamulpur	Goibari	814	4185	811	4200
9			Baska	Madhupur	163	874	425	2275
10			Nalbari	Angarkata P.G.R.	NA	NA	NA	NA
11			Nalbari	Dugapur	NA	NA	354	1484
12			Nalbari	Balabari (Part)	NA	NA	NA	NA

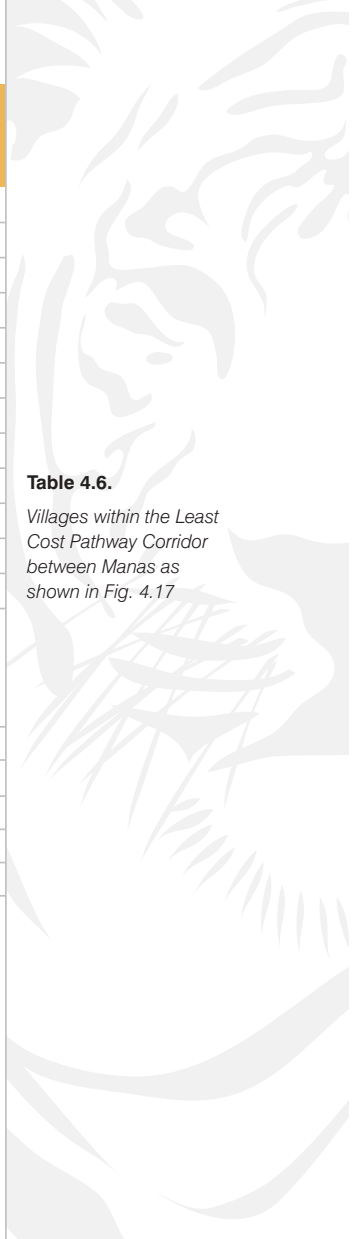


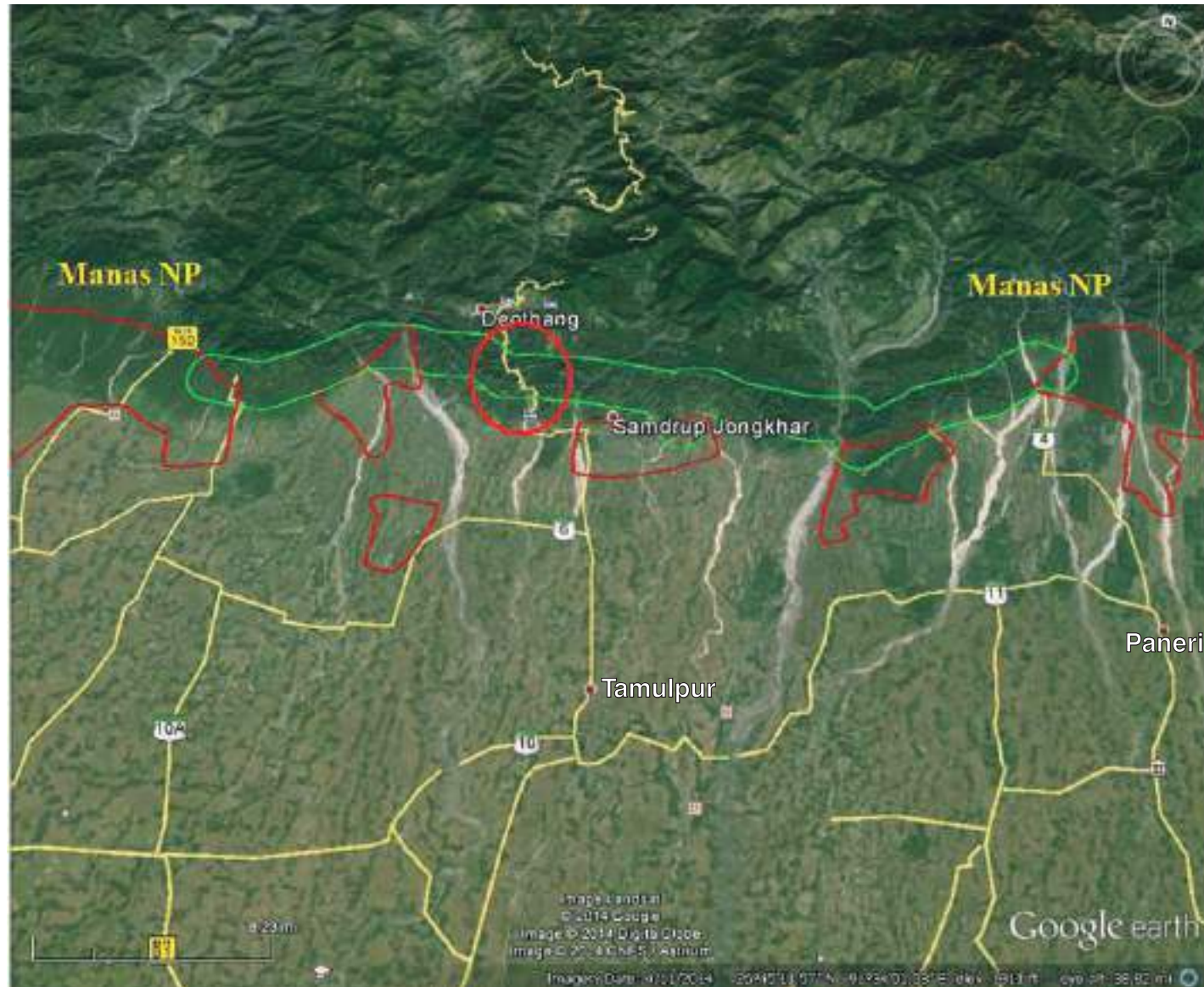
Table 4.6.

Villages within the Least Cost Pathway Corridor between Manas as shown in Fig. 4.17

Manas Corridor	
Habitat size	334 Km ²
Source Population	Manas-Buxa
Size of Source	9+ in 1349 Km ²
Protected Areas	Manas TR
	Buxa TR
Corridors	Manas-Buxa Corridor

Figure 4.18:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Manas



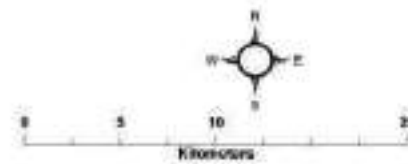
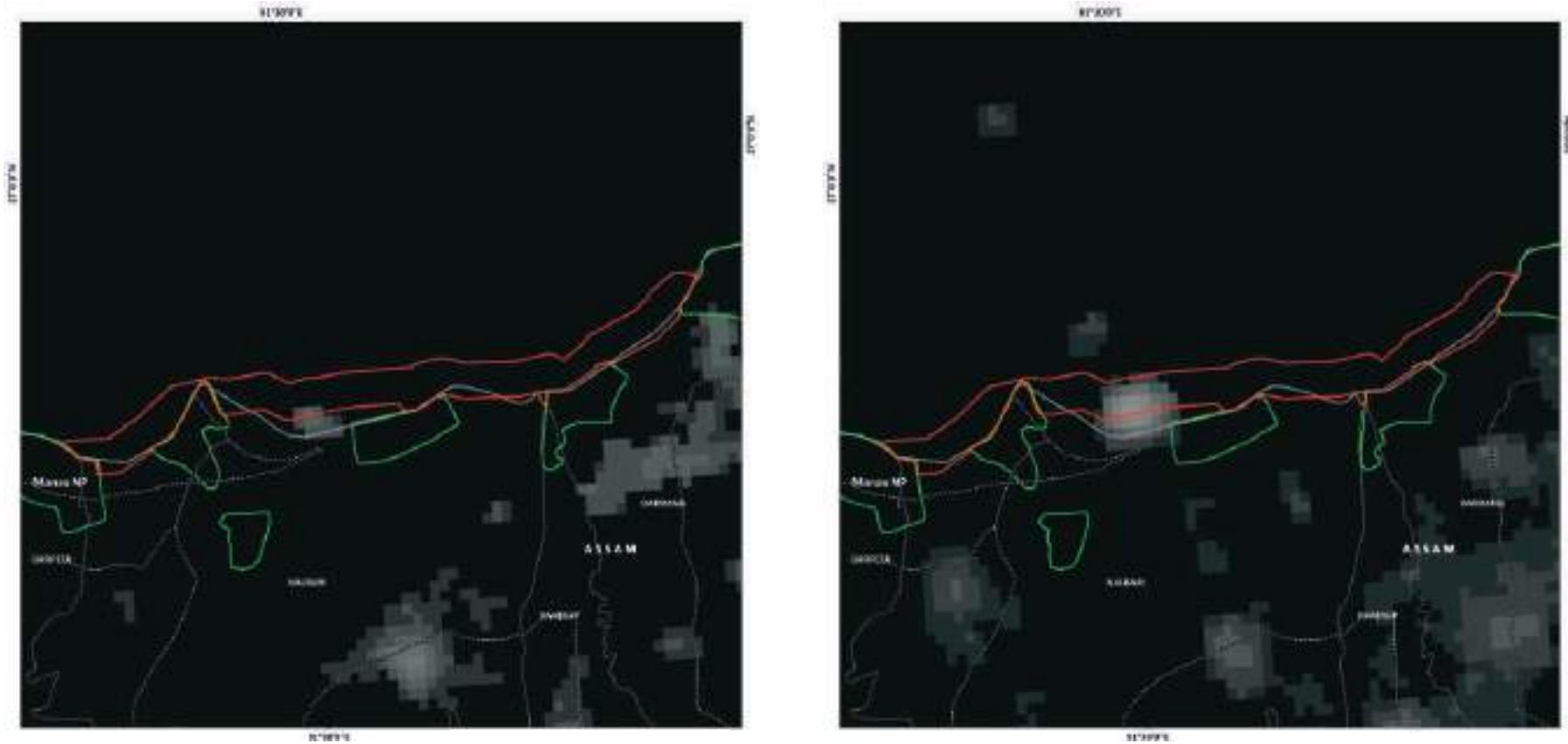
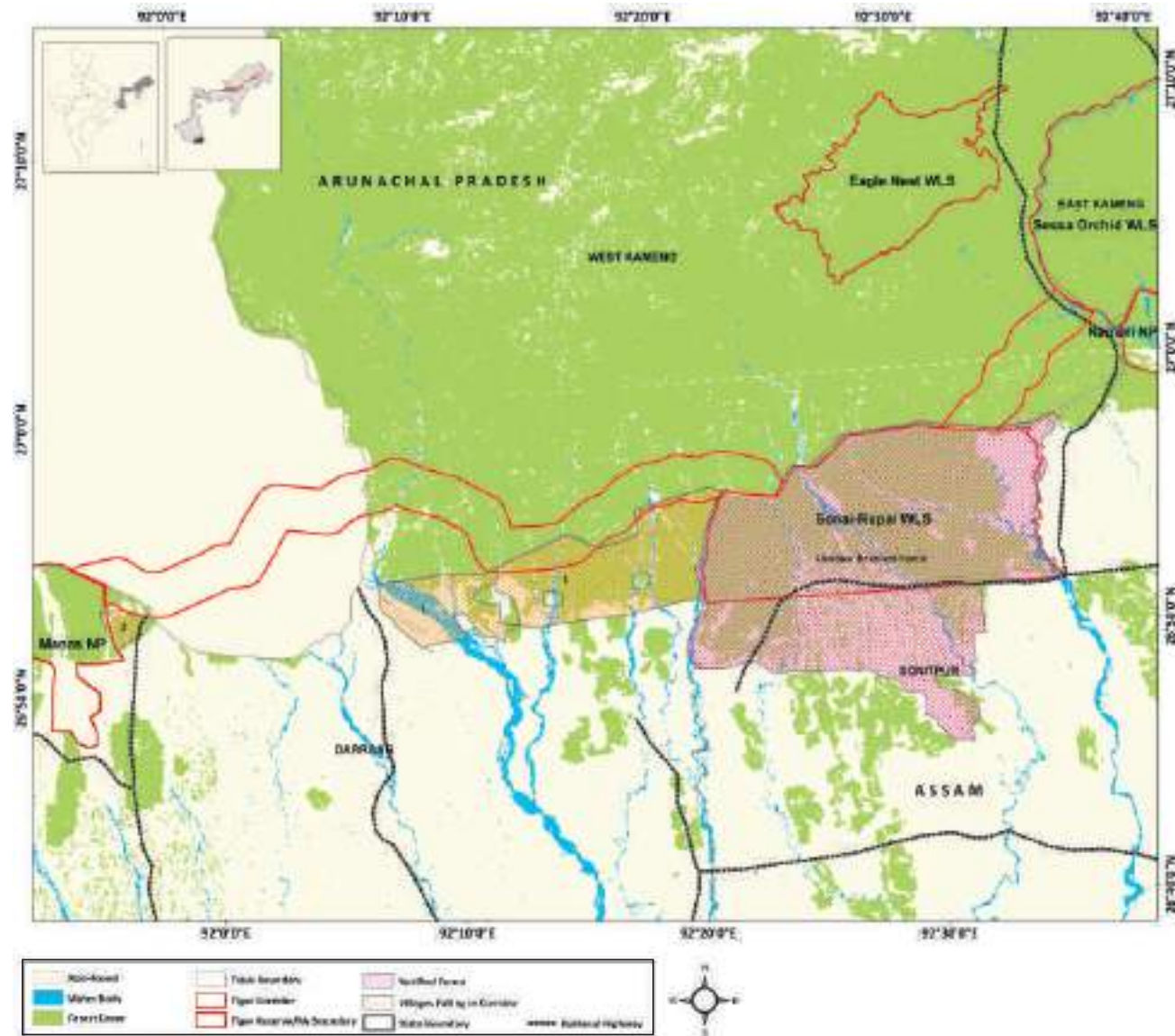


Figure 19.
Human habitation as depicted by nightlights within the Manas landscape in the year 1992 and 2012

Figure 4.20:

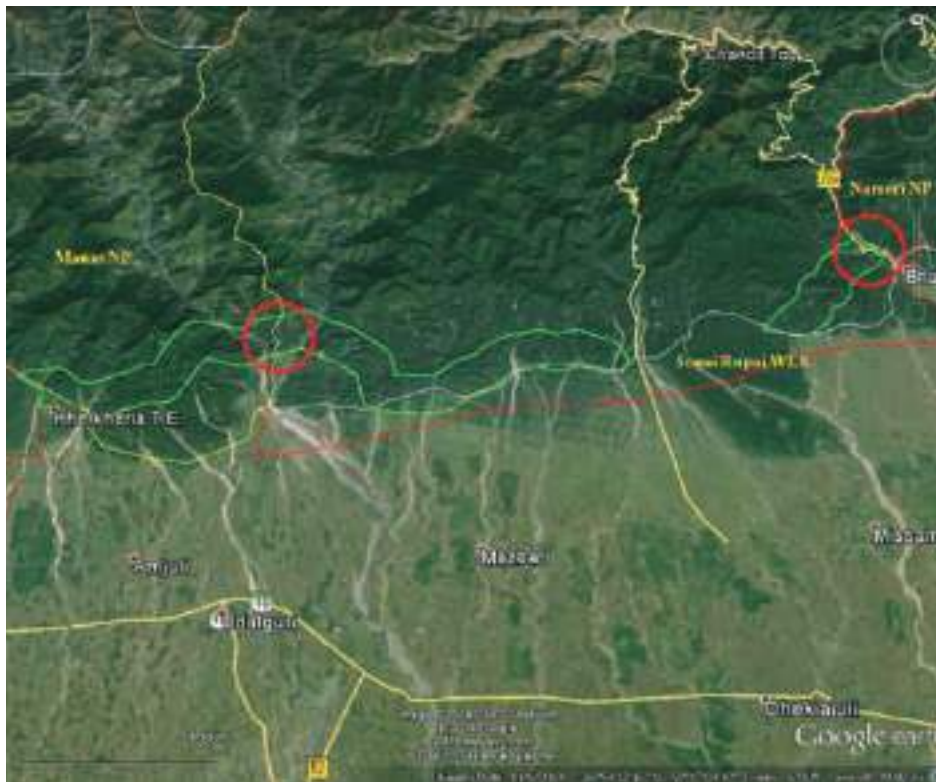
Least Cost Pathway corridor for Tiger movement between Paake-Nameri-Sonai-Rupai-Manas Corridor overlaid with village map (the village numbers are referenced in Table 4.7)



Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	ASSAM	DARRANG	UDALGURI	No.1 Dhansiri T.E.	512	2622	NA	NA
2		DARRANG	HARISINGA	Khairabari Grant	35	137	NA	NA
3		DARRANG	NA	NA	NA	NA	NA	NA

Table 4.7.

Villages within the Least Cost Pathway Corridor between Paake-Nameri-Sonai-Rupai-Manas as shown in Fig. 4.20



Paake-Nameri-Sonai-Rupai-Manas Corridor

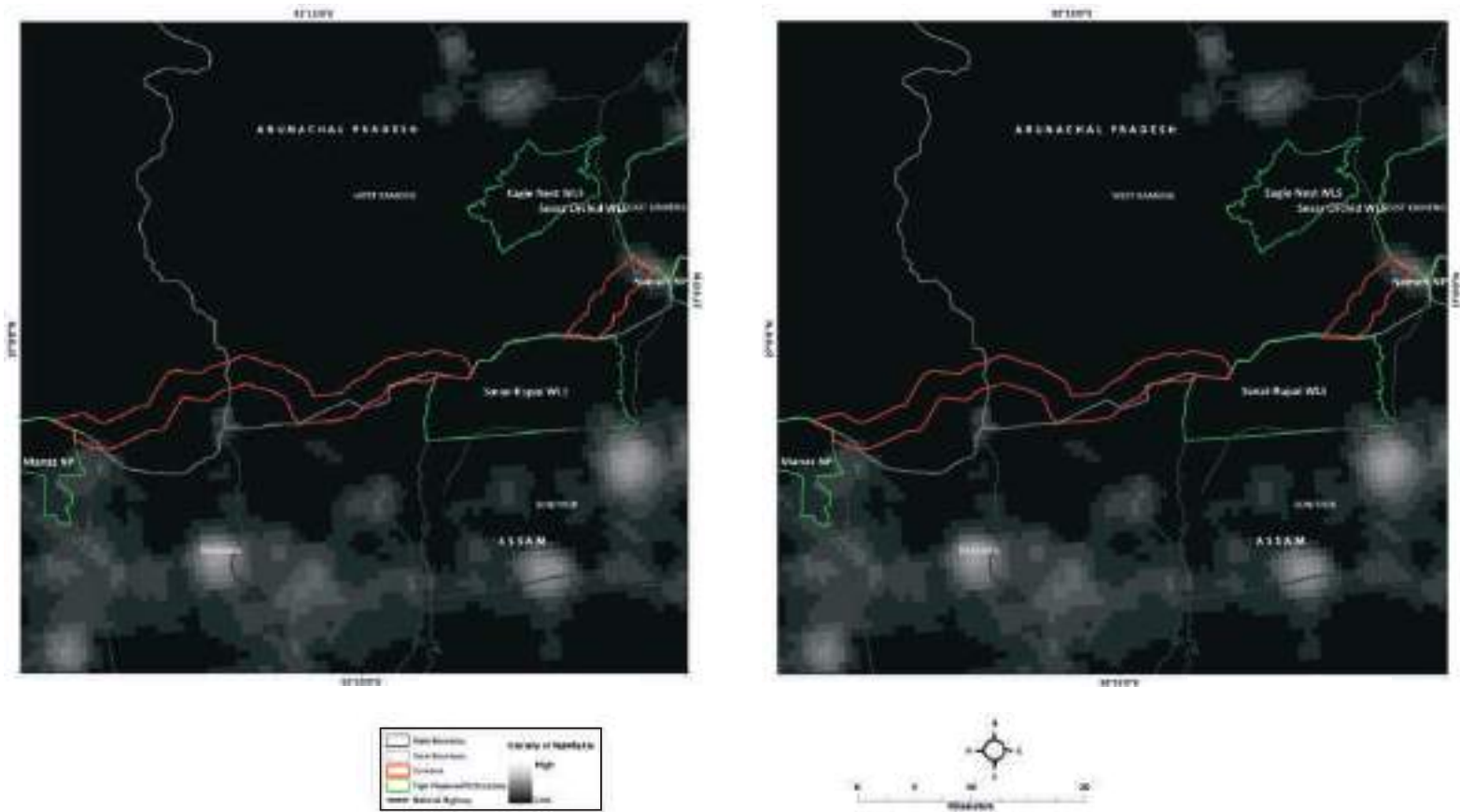
Habitat size	155799 Km ²
Source Population	Pakke-Nameri
Size of Source	9(7-11) tigers in 1089 Km ²
Protected Areas	Pakke TR
	Nameri TR
	Sonai-Rupai WLS
	Manas TR
Corridors	Nameri TR-Sonai-Rupai WLS
	Sonai-Rupai WLS- Manas TR

Figure 4.21:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Paake-Nameri-Sonai-Rupai-Manas

Figure 4.22:

Human habitation as depicted by nightlights within the Paake-Nameri_Sonai_Rupai-Manas landscape in the year 1992 and 2012



Nameri Tiger Reserve is located in Sonitpur and Tezpur districts of north-east Assam. It is contiguous with Pakke Tiger Reserve of Arunachal Pradesh to its north and covers an area of 344 km² of which 200 km² forms the core demarcated by Rivers Bhoreli and Bordikarai. Thirteen villages are located in the reserve of which eight are forest villages with predominantly tribal population. The population of tigers is small (about 9) and is shared with Pakke. Though the area has potential for higher densities and ability to sustain a larger population

of tigers, the depletion of prey by subsistence poaching as well as other anthropogenic disturbances likely results in depressed tiger populations. Its connectivity with Kaziranga is important and needs policy and managerial inputs for its continued viability. This complex may further be connected to the Sonai Rupai Wildlife Sanctuary in Assam and the greater forest complex of Arunachal Pradesh, that provides connectivity, although with high hunting pressures, to the forests further east into Namdapha, Intanki and maybe even Myanmar.

DIBRU SAIKHOWA-D'ERING-MEHAO, KAMLANG AND KANE WLS- TALE VALLEY WLS

The largest contiguous forested region in this landscape is over 136,000 km². This landscape unit commences in the north-west from Pakke Tiger Reserve through the forests of Palia, Tale Valley, Mouling and Dr. D'Ering Sanctuaries into Dibang National Park and upto Namdapha Tiger Reserve in the east. The landscape continues south through some degraded areas into Intanki National Park, and further South to Dampa Tiger Reserve and Blue Mountain National Park.

Pakke-Nameri landscape includes parts of the Sessa orchid Wildlife Sanctuary in Kameng district, Eagle Nest Wildlife Sanctuary, Pakke Tiger Reserve, parts of Nameri Tiger Reserve in Assam and continues via the forests of Tale Valley in to lower Subansiri to D'Ering Memorial Wildlife Sanctuary in East Siang upto Namdapha Tiger Reserve. The largest tiger population of Arunachal Pradesh is within pockets of this landscape. Tiger population of Pakke is shared with that of Nameri Tiger Reserve (Assam) and was estimated to be around 9 tigers.

The presence of *Dipterocarp* forests in this region along with the high levels of hunting, result in low abundances of prey which subsequently affect tiger abundances. Thus, despite the availability of vast forested areas in this zone, tiger abundances are low. The low-land forest and hill forest are connected within Arunachal Pradesh and with Assam.

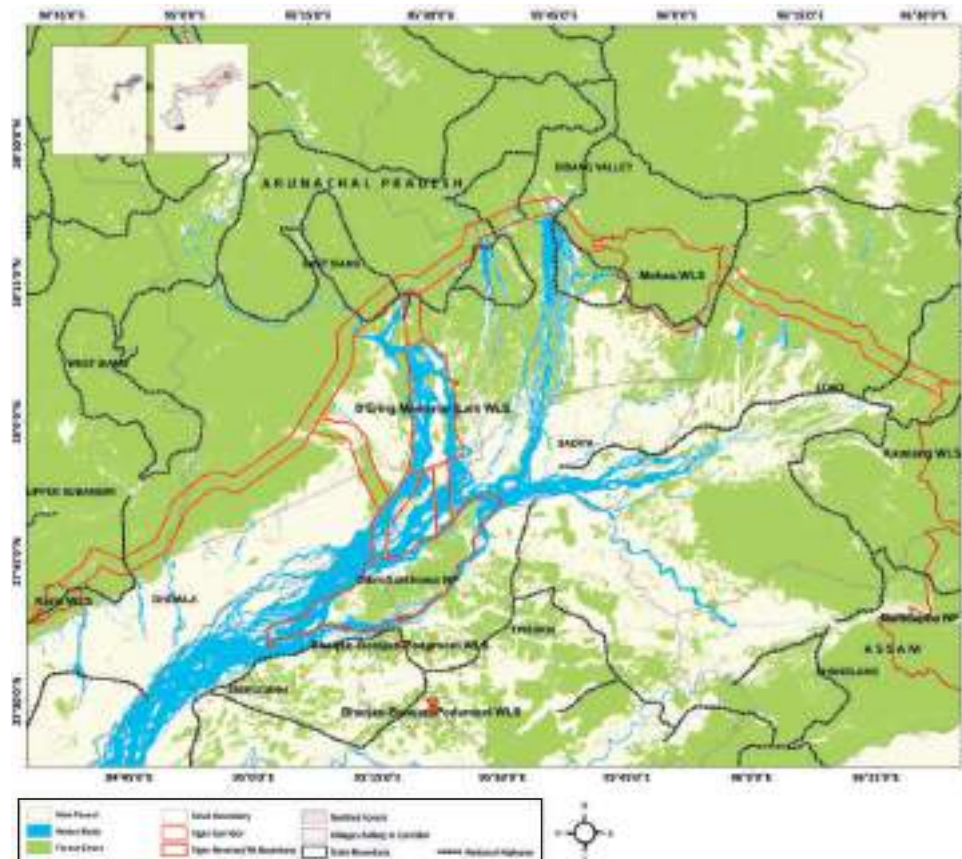


Figure 4.23:
Least Cost Pathway corridor for Tiger movement between Dibru Saikhowa-D'Ering-Mehao-Kamlang Corridor overlaid with village map

Figure 4.24:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Dibru Saikhowa-D'Ering-Mehao-Kamlang



Dibru Saikhowa-Ering-Mehao Corridor

Habitat size	155799 Km ²
Source Population	Arunachal Pradesh-Bhutan
Size of Source	NA
Protected Areas	Dibru-Saikhowa NP D'Ering Memorial WLS Mehao WLS
Corridors	Dibru-Saikhowa NP-D'Ering Memorial WLS D'Ering Memorial WLS-Mehao WLS

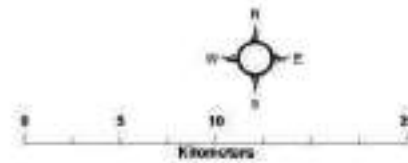
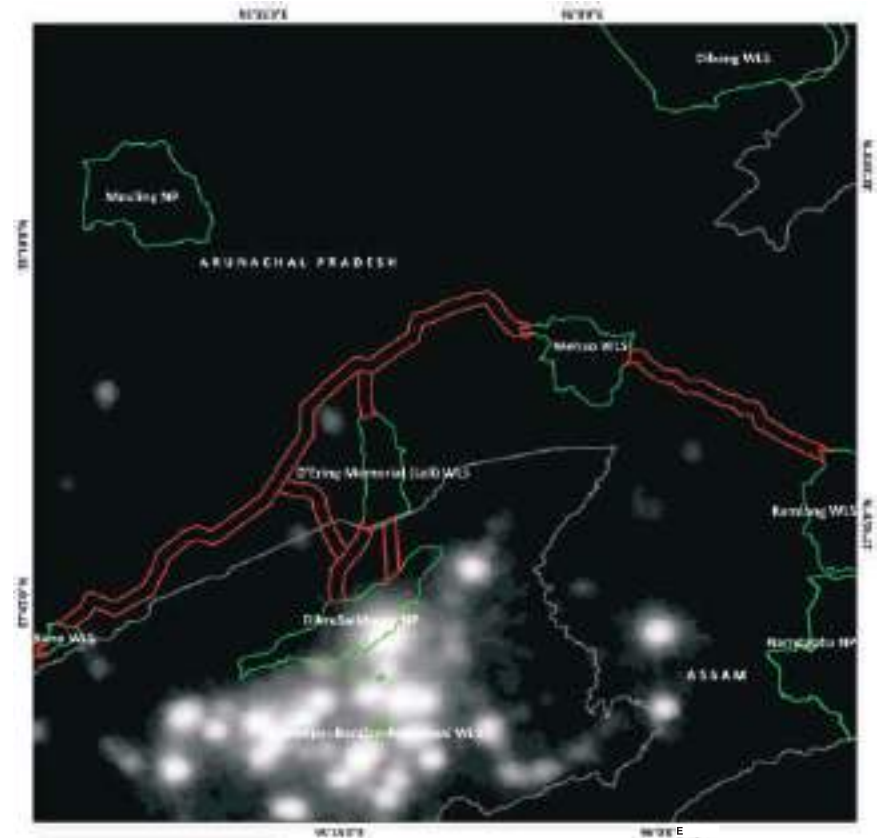
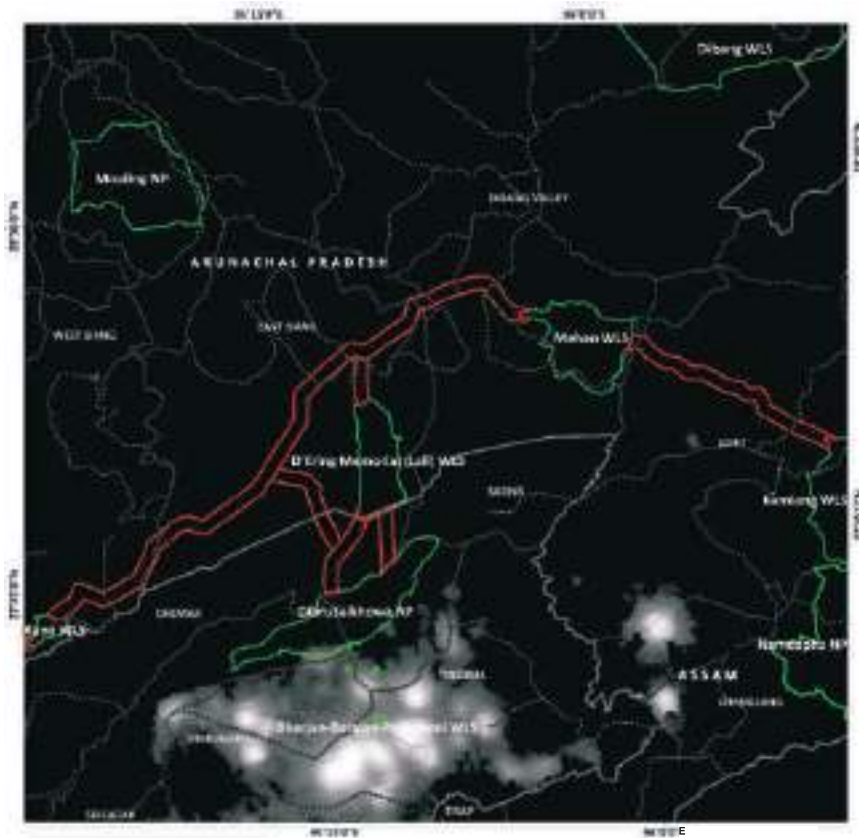
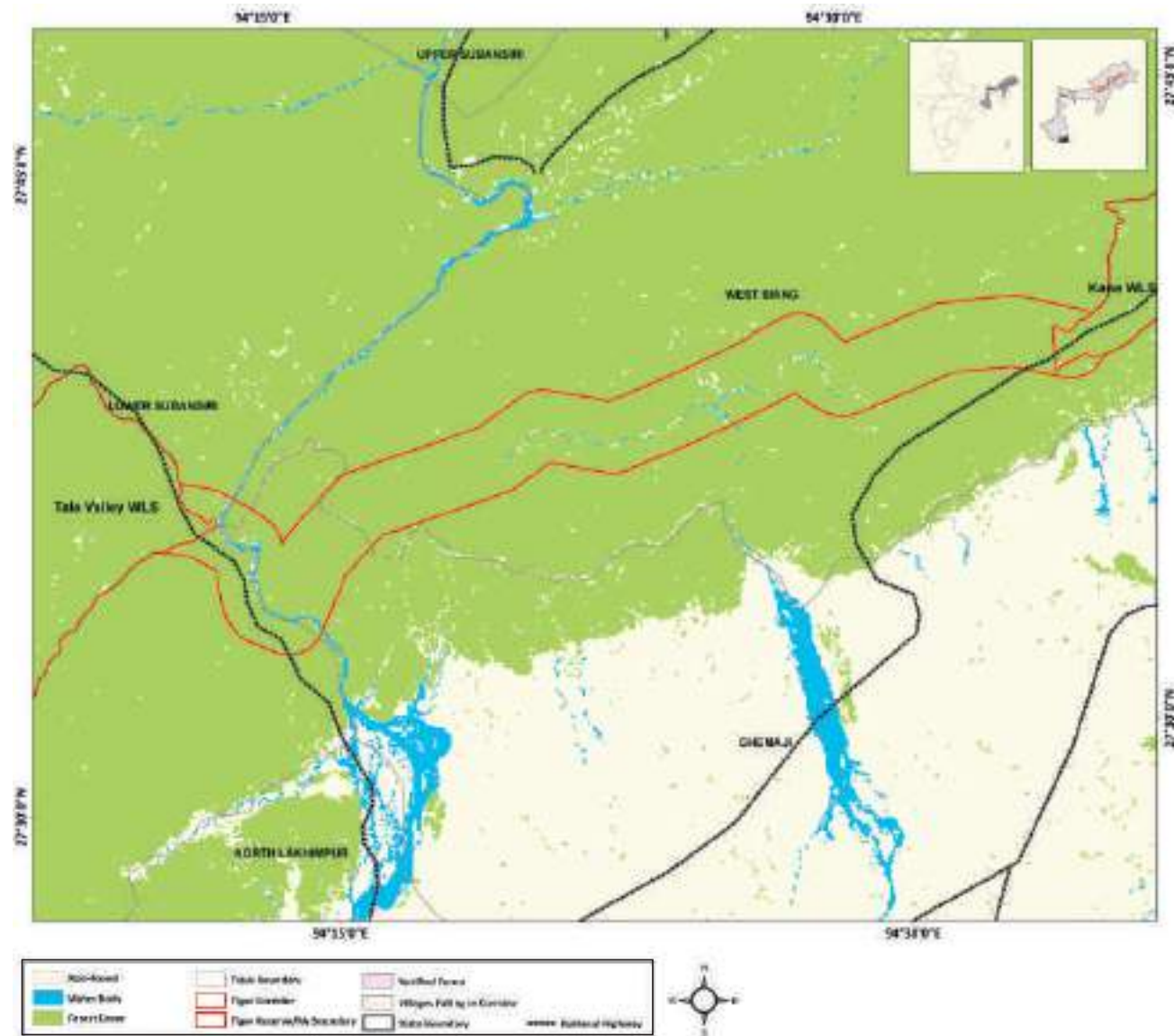


Figure 4.25:
 Human habitation as depicted by nightlights within the Dibru Saikhowa-Ering-Mehao landscape in the year 1992 and 2012

Figure 4.26:

Least Cost Pathway corridor for Tiger movement between Kane WLS-Tale Valley WLS Corridor overlaid with village map



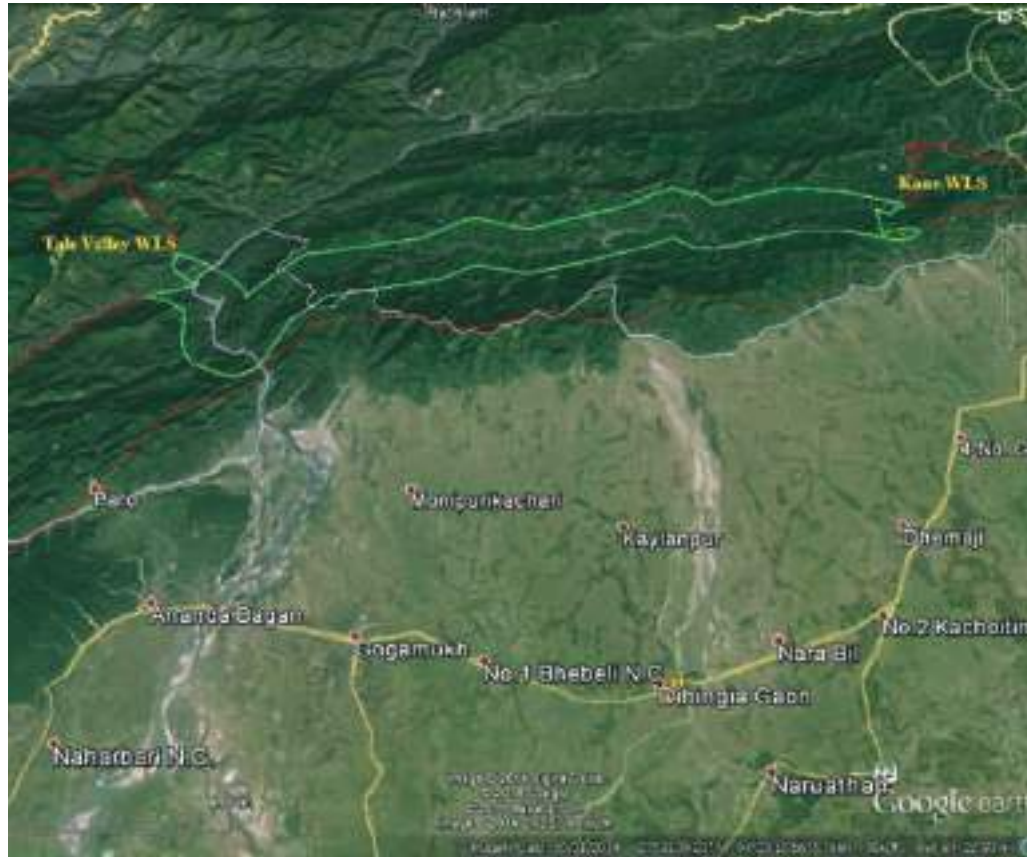


Figure 4.27:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kane WLS-Tale Valley WLS

Kane WLS-Tale Valley WLS Corridor

Habitat size	155799 Km ²
Source Population	Arunachal Pradesh-Bhutan
Size of Source	NA
Protected Areas	Kane WLS
	Tale WLS
Corridors	Kane WLS-Tale WLS

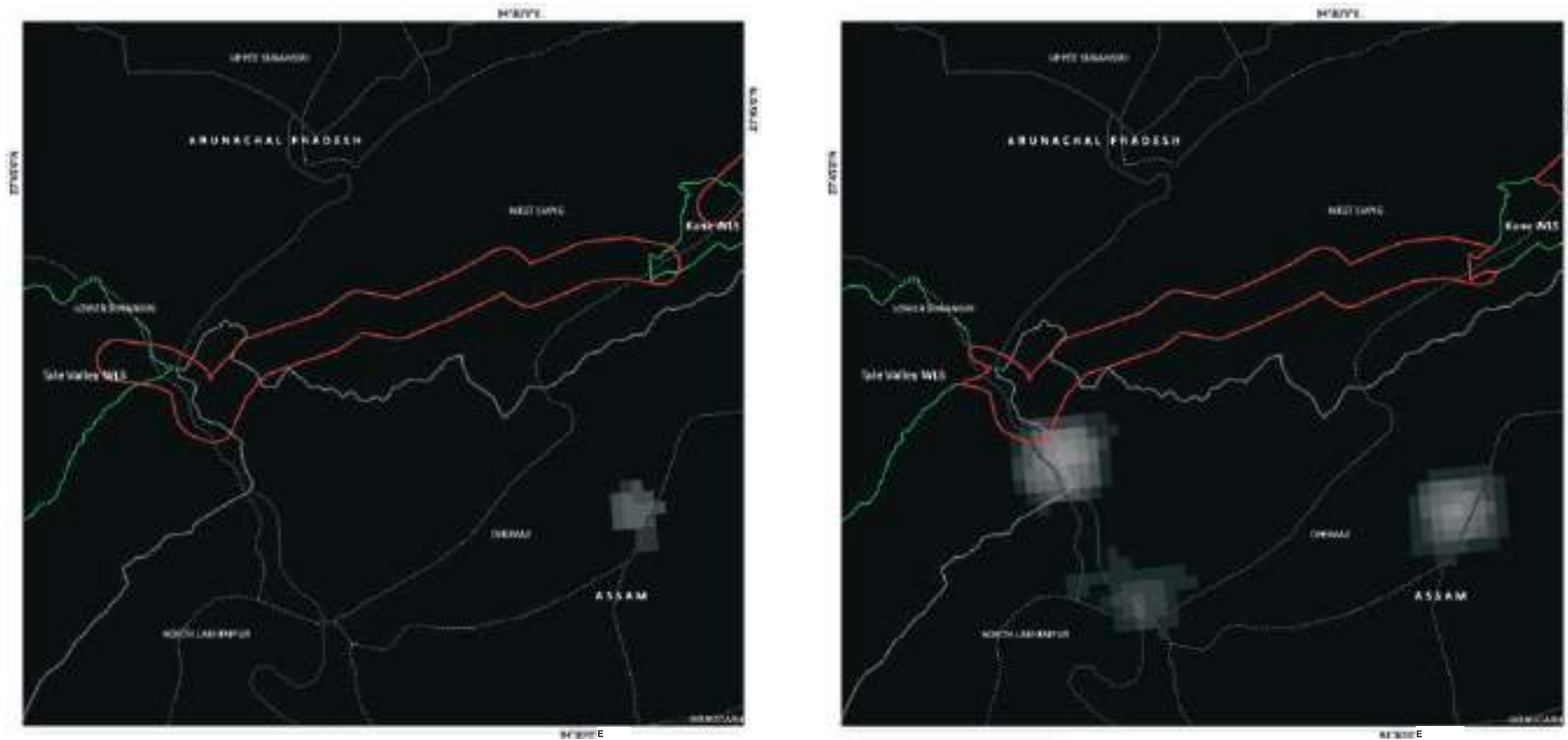
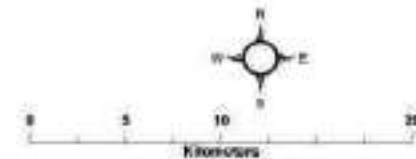


Figure 4.28:

Human habitation as depicted by nightlights within the Kane WLS-Tale Valley WLS landscape in the year 1992 and 2012



BUXA-JALDAPARA

Buxa, is located in the Alipurduar sub-division of Jalpaiguri district and covers an area of 760.87 km². To the east, it is separated from the Manas Tiger Reserve of Assam by River Sankosh while on the west, tea estates and the Joygaon-Nimti State Highway demarcate its boundaries. To the north of it is the international boundary with Bhutan while on the south a mosaic of agricultural land, tea estates and the National Highway 31C are located. The Reserve has 37 forest villages while 7000-8000 pilgrims visit the Mahakal Temple, located within the Reserve, in March each year. The other factors adding to existing disturbance levels in the area include existence of a number of PWD roads, a National Highway and a meter gauge railway line from Damanpur to Hasimara. Until 1996, the area was also mined for dolomite, post which a stay order was passed on mining activities within the Park by the State High Court.

Buxa Tiger Reserve has a weak connectivity to Jaldapara National Park and Gorumara Wildlife Sanctuary. While both these latter areas are small with high levels of disturbance (with about 32 Toto villages around Jaldapara and 9 villages around Gorumara), they still provide some connectivity to tigers dispersing in this landscape. To the east, Buxa has a good connectivity with a much larger tiger landscape of Manas, Bor Nadi Wildlife Sanctuary in Assam and Royal Manas National Park in Bhutan.

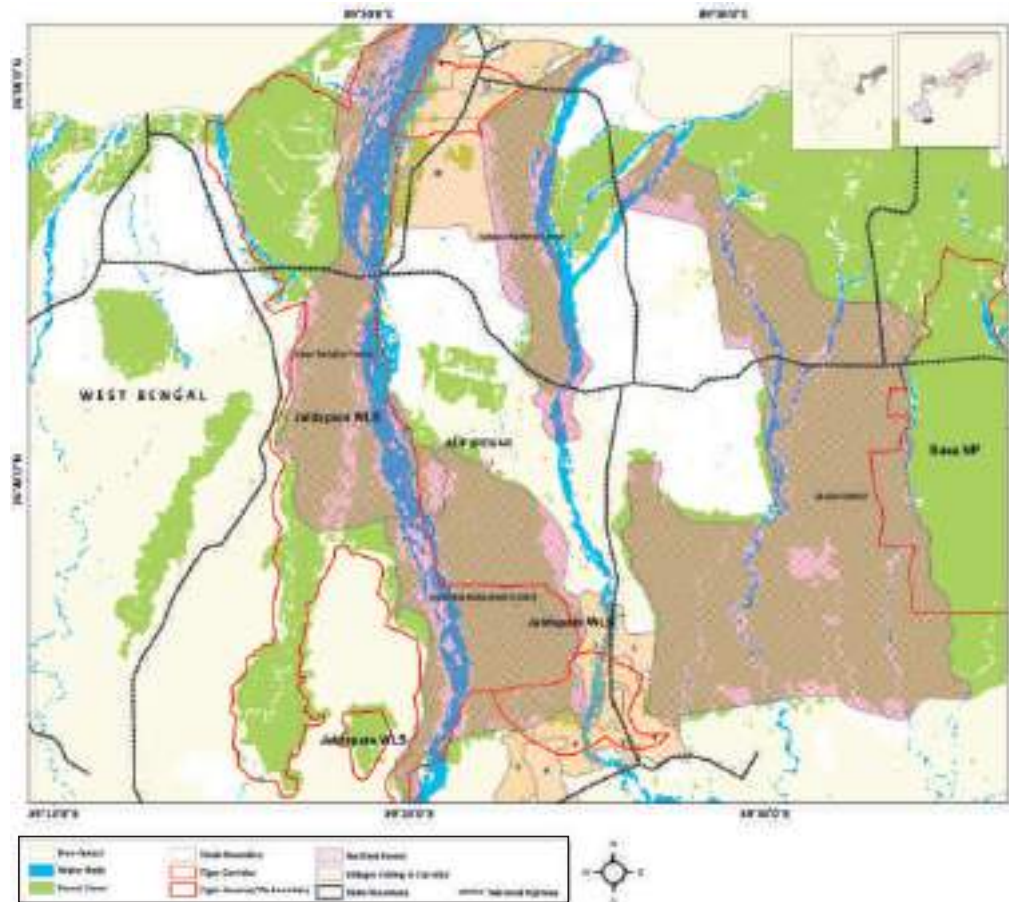


Figure 4.29:
Least Cost Pathway corridor for Tiger movement between Buxa-Jaldapara Corridor overlaid with village map (the village numbers are referenced in Table 4.8)

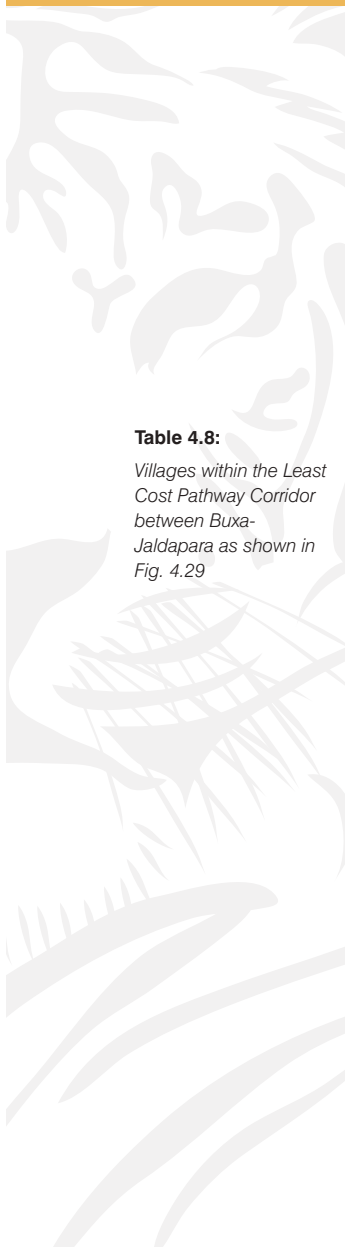


Table 4.8:
Villages within the Least Cost Pathway Corridor between Buxa-Jaldapara as shown in Fig. 4.29

Village_ID	State	District	Tehsil	Village	No of Household (2001)	Total Population (2001)	No of Household (2011)	Total Population (2011)
1	West Bengal	Jalpaiguri	Kalchini	Dakshin Mandabari	516	2625	NA	NA
2			Kalchini	Nimtijhora Tea Garden	870	4266	NA	NA
3			Alipurduar -I	Kumarpara	345	1823	NA	NA
4			Alipurduar -I	Uttar Paitkapara	545	2716	NA	NA
5			Alipurduar -I	Paitkapara Tea Garden	905	4654	NA	NA
6			Alipurduar -I	Uttar Chakoakheti	241	1251	NA	NA
7			Alipurduar -I	Madhya Paitkapara	331	1712	NA	NA
8			Alipurduar -I	Mathura Tea Garden	1705	8472	NA	NA
9			Kalchini	Mechiabasti	966	5046	NA	NA
10			Kalchini	Dalsingpara Tea Garden	2879	15752	NA	NA
11			Kalchini	Tosra Tea Garden	1007	5142	NA	NA

Buxa-Jaldapara Corridor

Habitat size	9096 Km ²
Source Population	Manas-Buxa
Size of Source	9+ in 1349 Km ²
Protected Areas	Buxa TR
	Jaldapara WLS
Corridors	Buxa-Jaldapara1
	Buxa-Jaldapara2

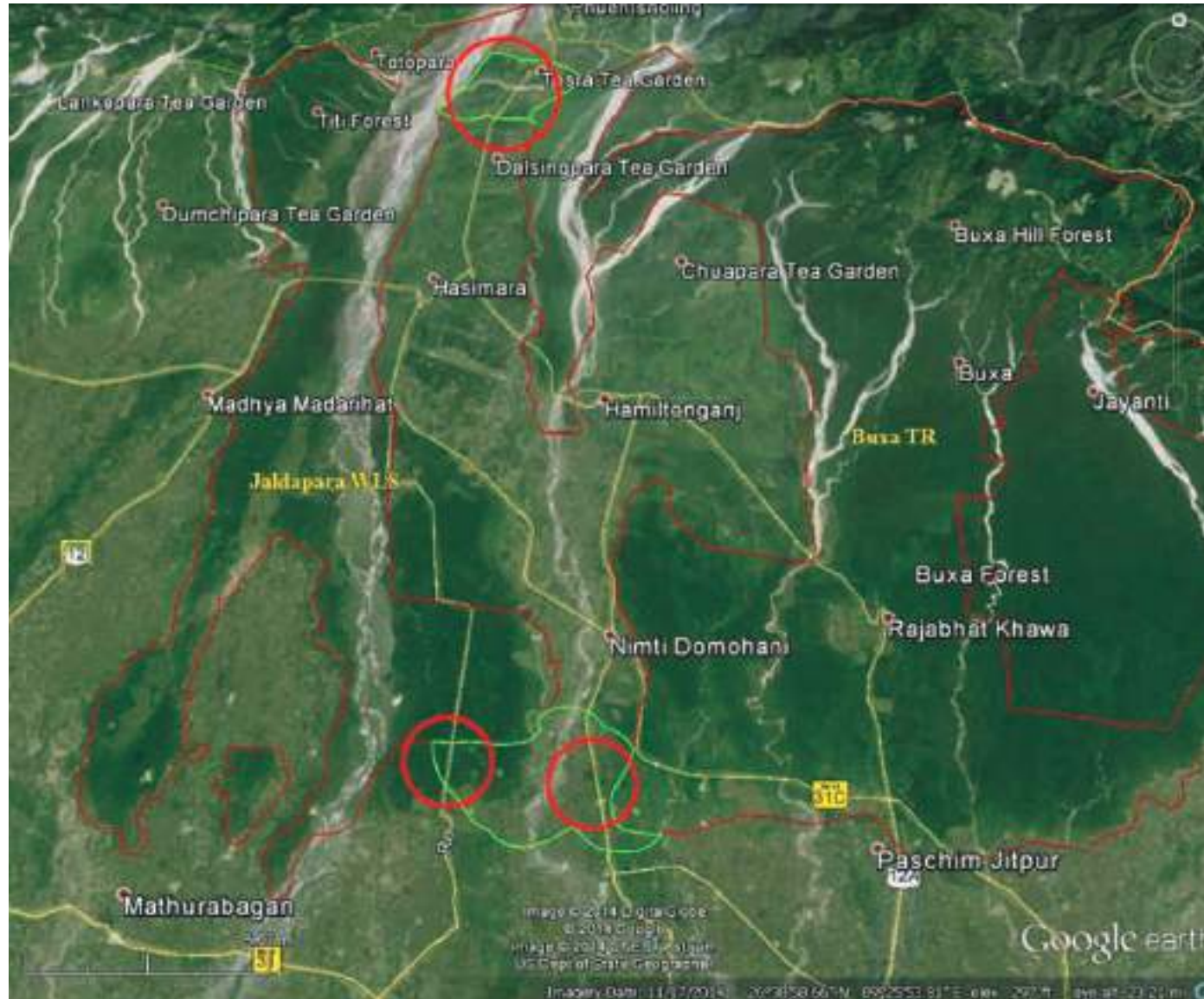


Figure 4.30:
 Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Buxa-Jaldapara

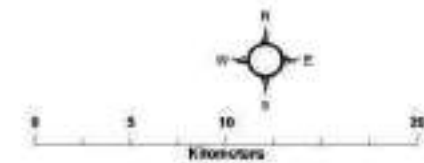
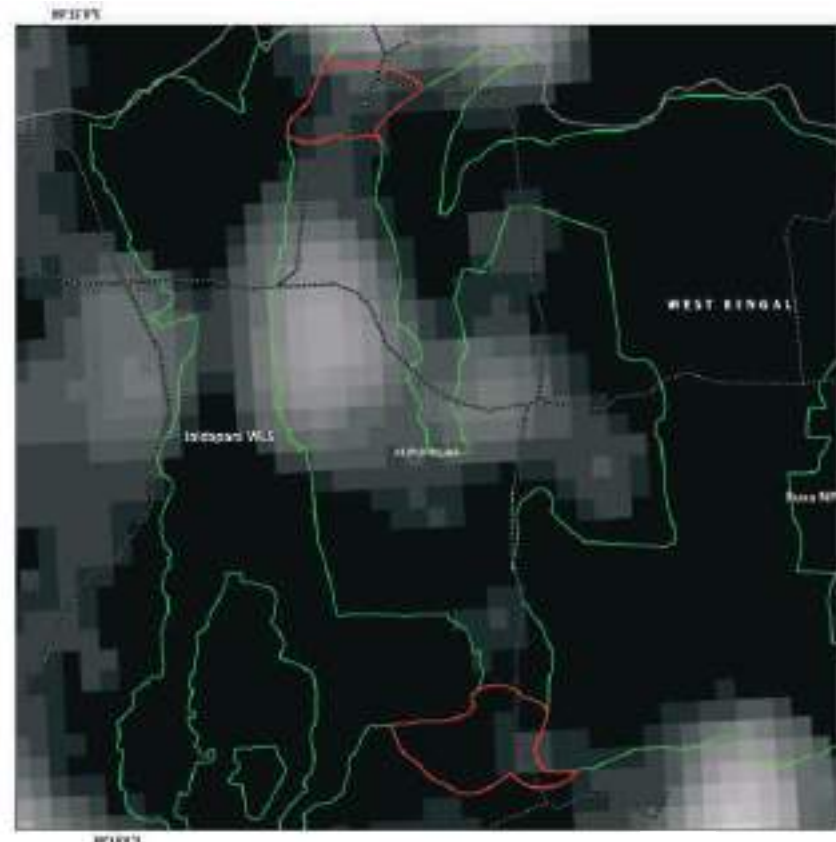
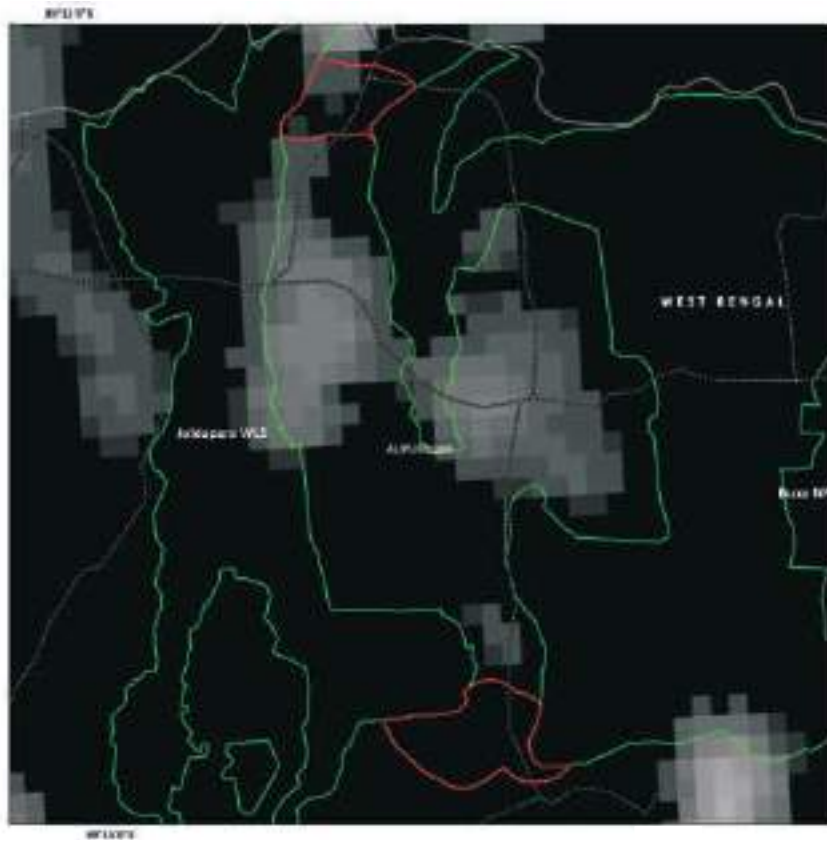


Figure 4.31:
Human habitation as depicted by nightlights within the Buxa-Jaldapara landscape in the year 1992 and 2012

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