

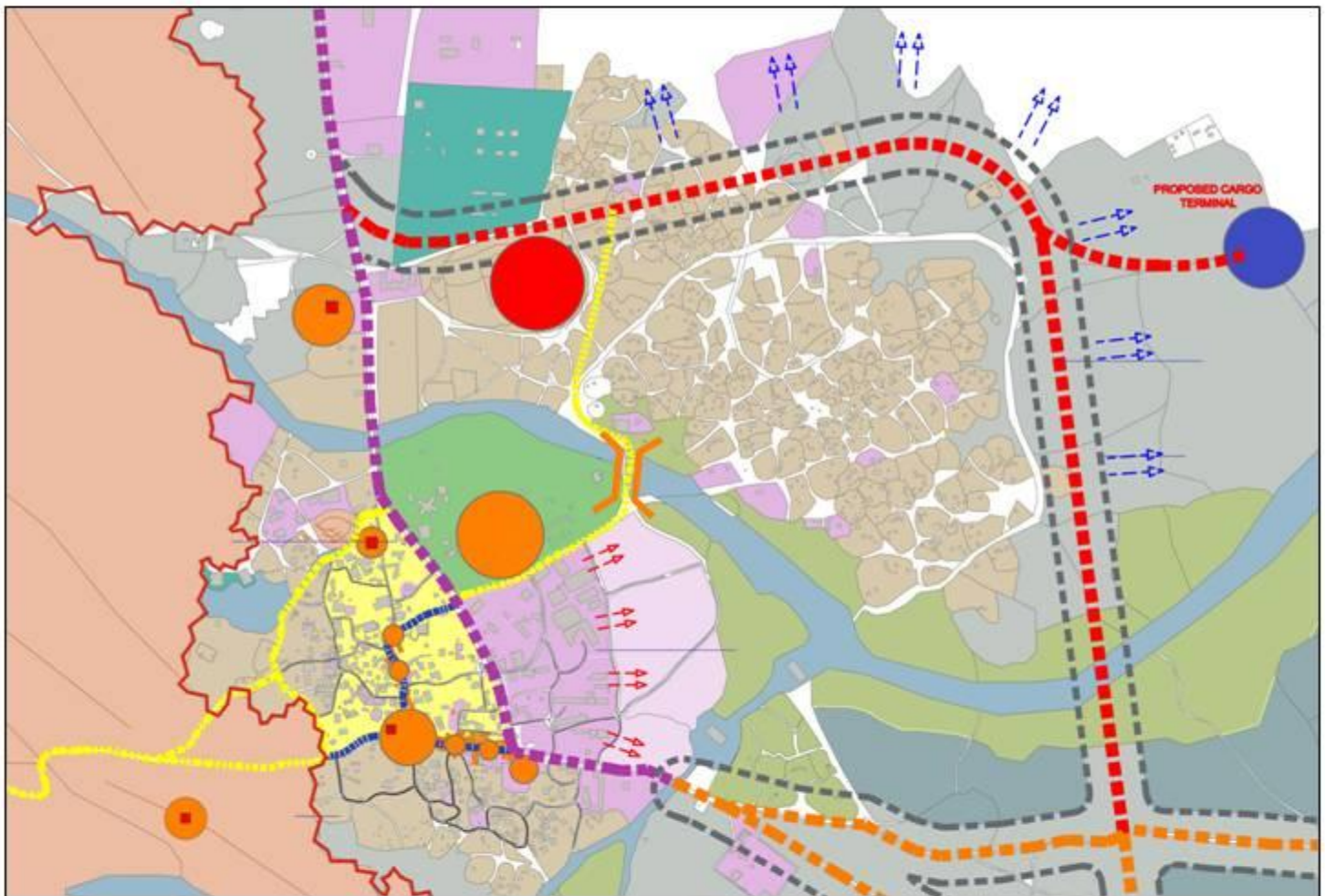
NAGARPARKAR TALUKA PLANNING PROJECT

Volume – Three)

RECOMMENDATIONS AND PROPOSALS

(First Draft: 30 May 2009)

**Prepared for the Thardeep Rural Development Programme,
Mithi, District Tharparkar, Sindh**



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INTRODUCTION

This report constitutes Volume Three (Recommendations and Proposals) of the Nagarparkar Taluka Planning Project which has been initiated by Thardeep Rural Development Programme (TRDP). Volume One (produced earlier) consists of a description of Existing Conditions and Future Scenarios and Volume Two of 57 maps and digitized satellite images documenting and describing existing physical and socio-economic conditions at various settlements and corridors of movement in the Nagarparkar Taluka.

This volume gives a brief background to the Project along with a summary of important findings (detailed in the earlier reports) so that the reader can understand the basis on which the recommendations and the proposals have been developed. The report also suggests certain institutional arrangements that the TRDP, Government of Sindh and the Tharparkar District Government may like to develop for the implementation of the recommendations. However, the suggestions and the proposals contained in this report need to be reviewed through stakeholder workshops, discussions and debates on the basis of which modifications to the report can be made and proposals finalised. TRDP intends to initiate such a process.

Persons who have worked on this report are my colleagues Architect/Planner Christophe Polak and Architects Furqan Khan, Aqsa Mumtaz and Tooba Bint-i-Tahir. The report has been put together by my Secretary, Israr Ahmad Rana.

ARIF HASAN

For HASAN & POLAK

Karachi, Date: 26 May 2009

1. BACKGROUND

1.1 ORIGINS OF THE PROJECT

After building of the road from Mithi to Nagarparkar, Thardeep Rural Development Project (TRDP) noticed that a very large number of people started visiting Nagarparkar's built-heritage sites and scenic spots, especially after the rains. There was also a marked increase in the number of people attending religious festivals and melas. Over the long weekend of August 14, 2008, over 35,000 persons visited the area.

TRDP was concerned regarding this increase because in the absence of proper planning for tourist related infrastructure, it could have serious adverse physical and social repercussions on the Taluka. At the same time, this influx of tourists and pilgrims to religious sites could benefit the economy of the area and hence its people as well.

1.2 TRDP'S INITIATIVE

As a result of the above concerns and a desire to tap the potential of tourism for the local population, the TRDP decided to:

- Develop Kasbo Village as a tourist destination and resort with community involvement and management
- Build a tourist information and residential area on a plot of land it has purchased in Nagarparkar and to have it managed and run by local communities with support and training from the TRDP
- Make tourism related inputs in Nagarparkar Town by helping to preserve and promote heritage sites and their immediate environment
- Contact Arif Hasan for discussions on how to proceed with the architectural and planning inputs required for the above projects

1.3 VISITS AND DISCUSSIONS

Between August and October 2008, Arif Hasan and his colleagues from Hasan & Polak (Architects and Urban Planners) visited Nagarparkar Taluka several times and had discussions with the TRDP, local communities and local government representatives and agencies at various sites. As a result, a number of conclusions were arrived at. These are listed below:

- Nagarparkar Taluka has a whole range of built and archaeological heritage sites, places of Hindu and Muslim pilgrimage, numerous melas and intangible heritage linked to them. These sites are not maintained and are deteriorating rapidly.
- With tourism and an increase in pilgrims, scenic spots would be encroached upon. Already the sale of land was taking place for that purpose, especially along the Bodisar-Nagarparkar Corridor.
- The building of the Badin Coastal Highway and the Thar Coal Project would further increase economic activity related to granite and China clay mining and introduce the

fisheries industry in the Taluka as well. It is estimated that this would generate around 80,000 jobs by 2020 most of which would go to outsiders unless otherwise planned for.

- This development, unless planned for, would have severe ecological repercussions, marginalise the Tharris and adversely affect the culture of tolerance (that Nagarparkar is known for) and the folklore of the region.
- With roads, transport would create massive environmental degradation unless the required infrastructure to serve it is created. This is already happening in Nagarparkar Town.
- Given the present construction and development trends, the above scenario would lead to the development of an irrational landuse and an environmentally unfriendly architecture would develop in the form of tourist facilities, offices, schools and factories. This would devastate the urban and rural built and natural environment of the Taluka. Again this is already happening and a climatically and environmentally inappropriate architecture is being created.
- The above changes would not only effect Kasbo Village and Nagarparkar Town but would also result in major landuse changes in the villages of Virawah, Bodisar, Ghor and Churio, all of which contain considerable built and intangible heritage.
- These changes would also affect the Islamkot to Virawah, Virawah to Bodisar, Bodisar to Nagarparkar and Nagarparkar to Kasbo corridors. Developments along these corridors unless planned for would encroach upon scenic spots and natural assets as they have done in other scenic areas of Pakistan.
- Meetings with local government organisations and agencies established that they did not have the human and financial resources to plan and effectively implement appropriate development.

1.4 FINAL WORK PLAN FOR PHASE ONE

On the basis of these findings, it was decided to document existing physical, socio-economic and governance related conditions in the Nagarparkar Taluka. For this satellite images of the corridors and settlements were acquired and digitised and detail surveys were carried out between November 2008 and January 2009. Work done for this Phase is given below:

i) Documentation of existing conditions

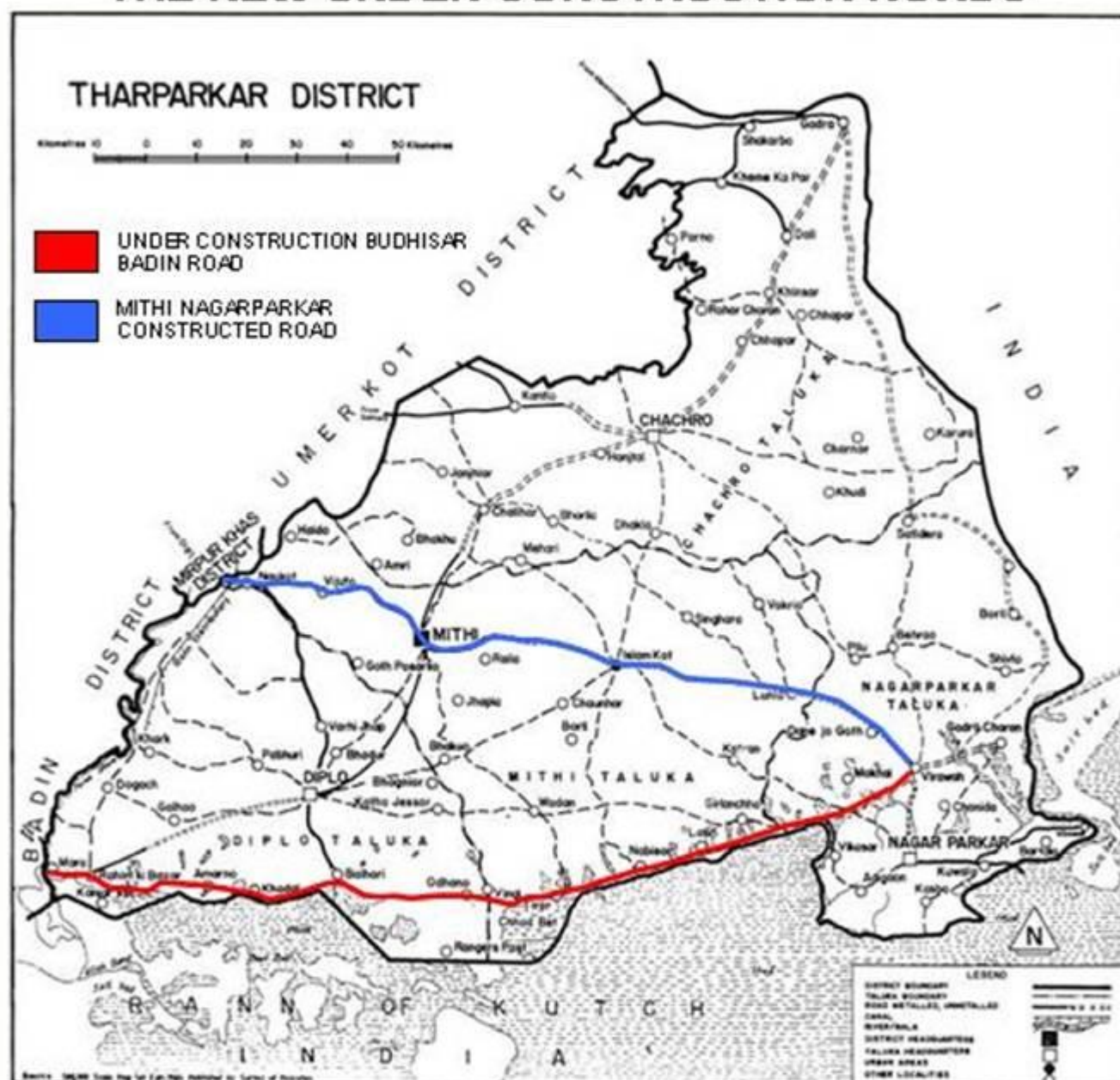
- The physical, socio-economic and governance related conditions, along with the history and folklore of the region, have been documented through interviews, observations and projections of the previous census reports and government and NGO literature.
- Scenarios for the future (2020) have been developed. These include the “do nothing scenario”, the “muddle through scenario”, and the “structure plan scenario”.
- Heritage and pilgrimage sites have been listed along with their history, folklore and present conditions.

ii) Mapping of conditions and landuse

- Satellite images of the important project locations have been acquired and digitised.
- Mapping for the following areas have been carried out.
 - Nagarparkar to Bodisar corridor
 - Nagarparkar
 - Nagarparkar to Kasbo corridor
 - Loralai
 - Kasbo
 - Virawah
 - Bodisar
 - Churio
- This mapping consists of the following:
 - Satellite image
 - Existing landuse
 - Land marks
 - Conservation sites
 - Traffic patterns
 - Land ownership
 - Heritage and tourism related locations
 - Age and conditions of buildings
- A report summarising this work has been prepared in two Volumes.
 - Volume 1: Existing Conditions and Future Scenarios
 - Volume 2: 57 Maps of Existing Conditions

1.5 MAPS OF THE THAR DISTRICT AND NAGARPARKAR TALUKA

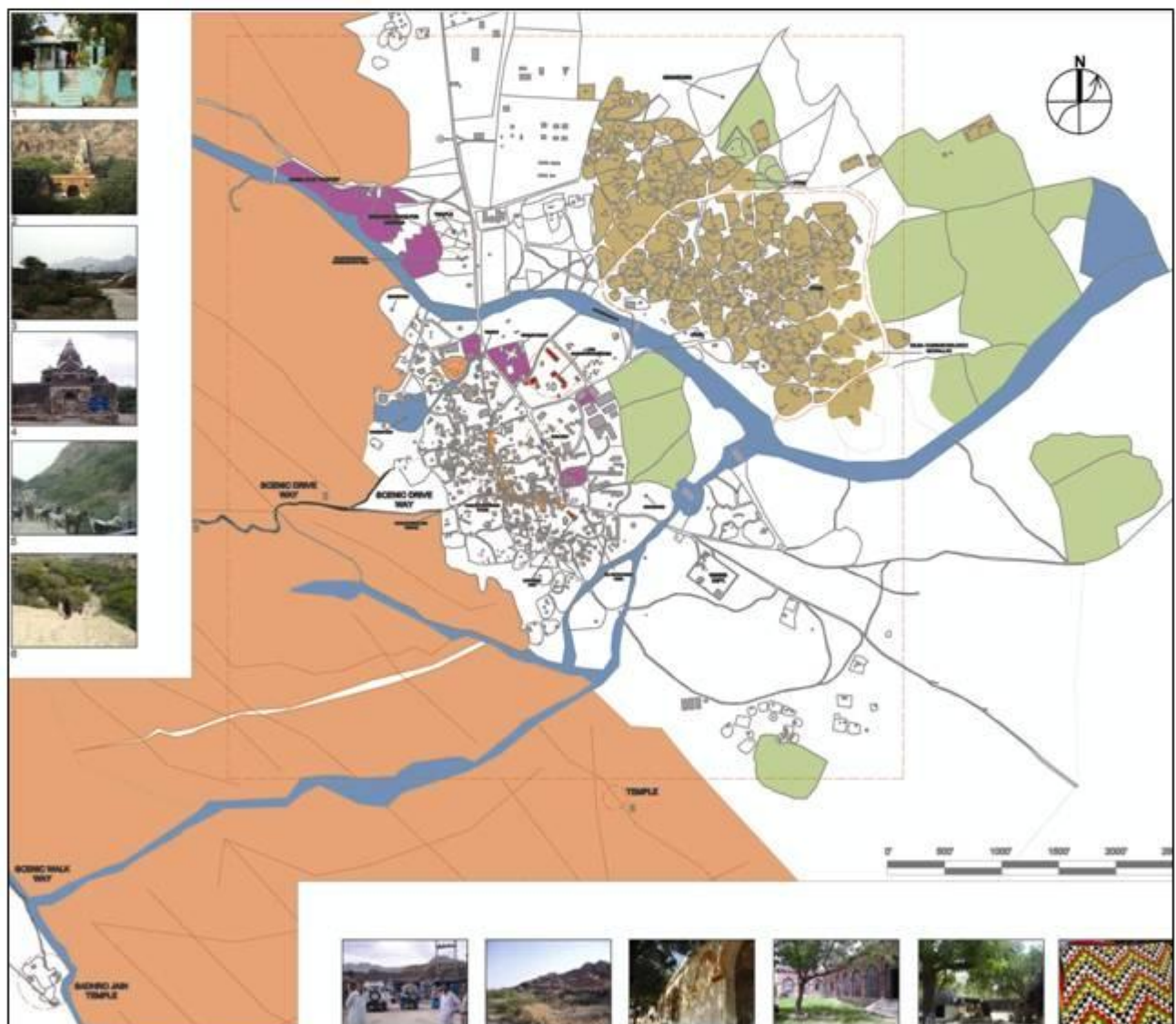
MAPS OF THE TALUKA AND THAR HIGHLIGHTING THE NEW UNDER CONSTRUCTION ROADS



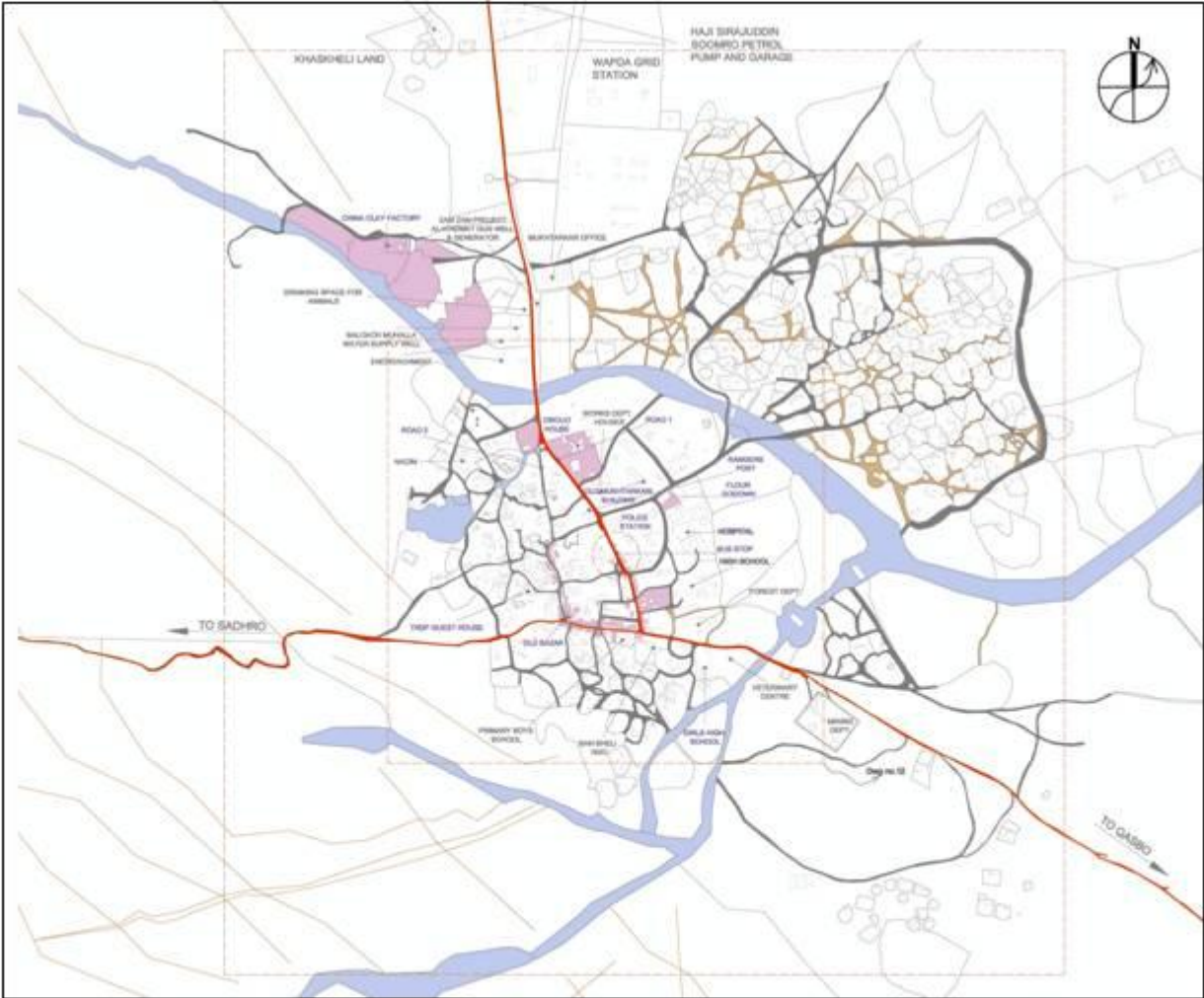
1.6 SOME EXAMPLES FOR MAPS MADE FOR PHASE ONE

NAGARPARKAR EXISTING HERITAGE AND TOURISM SITES

LEGEND	
	TRADITIONAL VILLAGE
	AGRICULTURE LAND
	OLD MARKET AREA
	GRANITE HILLS
	COMMERCIAL ACTIVITIES
	WATER ELEMENT
	SCENIC WAY
	HISTORICAL BUILDING
	TOURIST ATTRACTION NODES

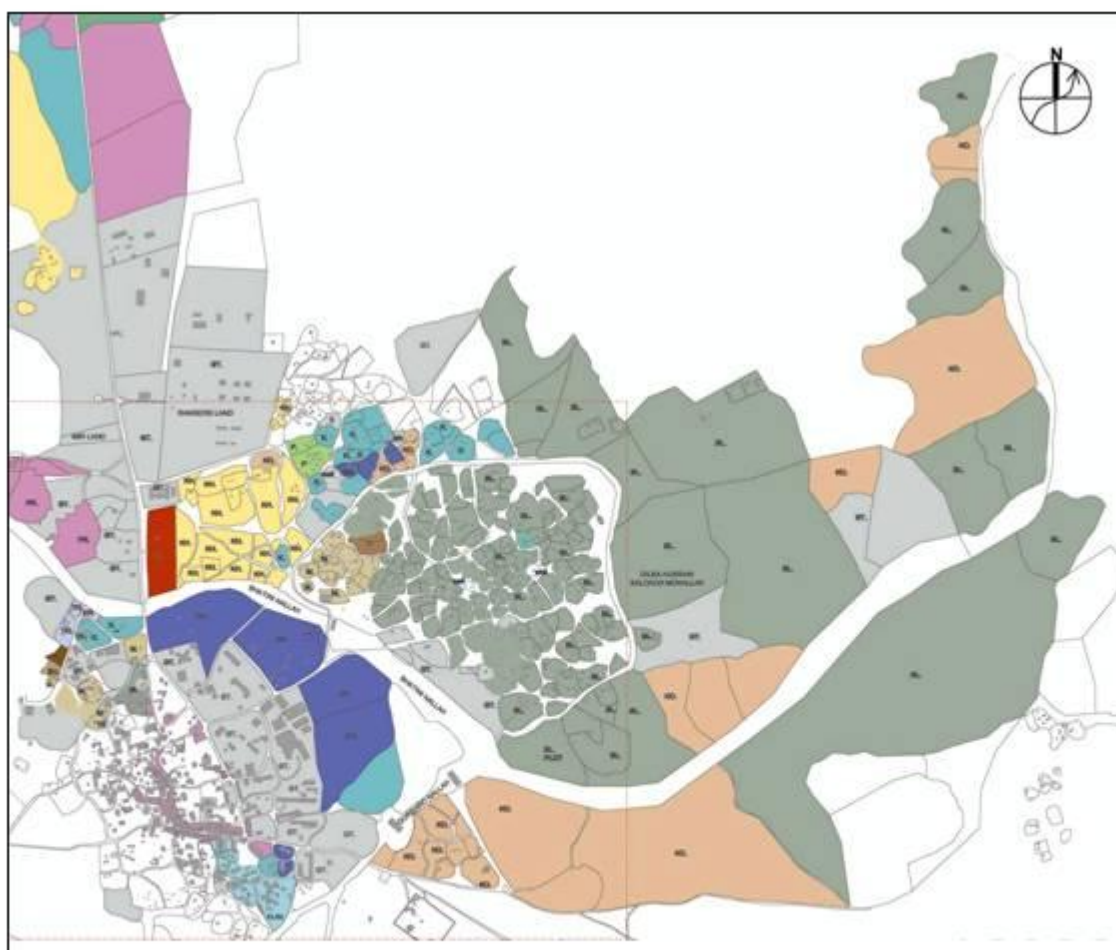


NAGARPARKAR EXISTING TRAFFIC PATTERN

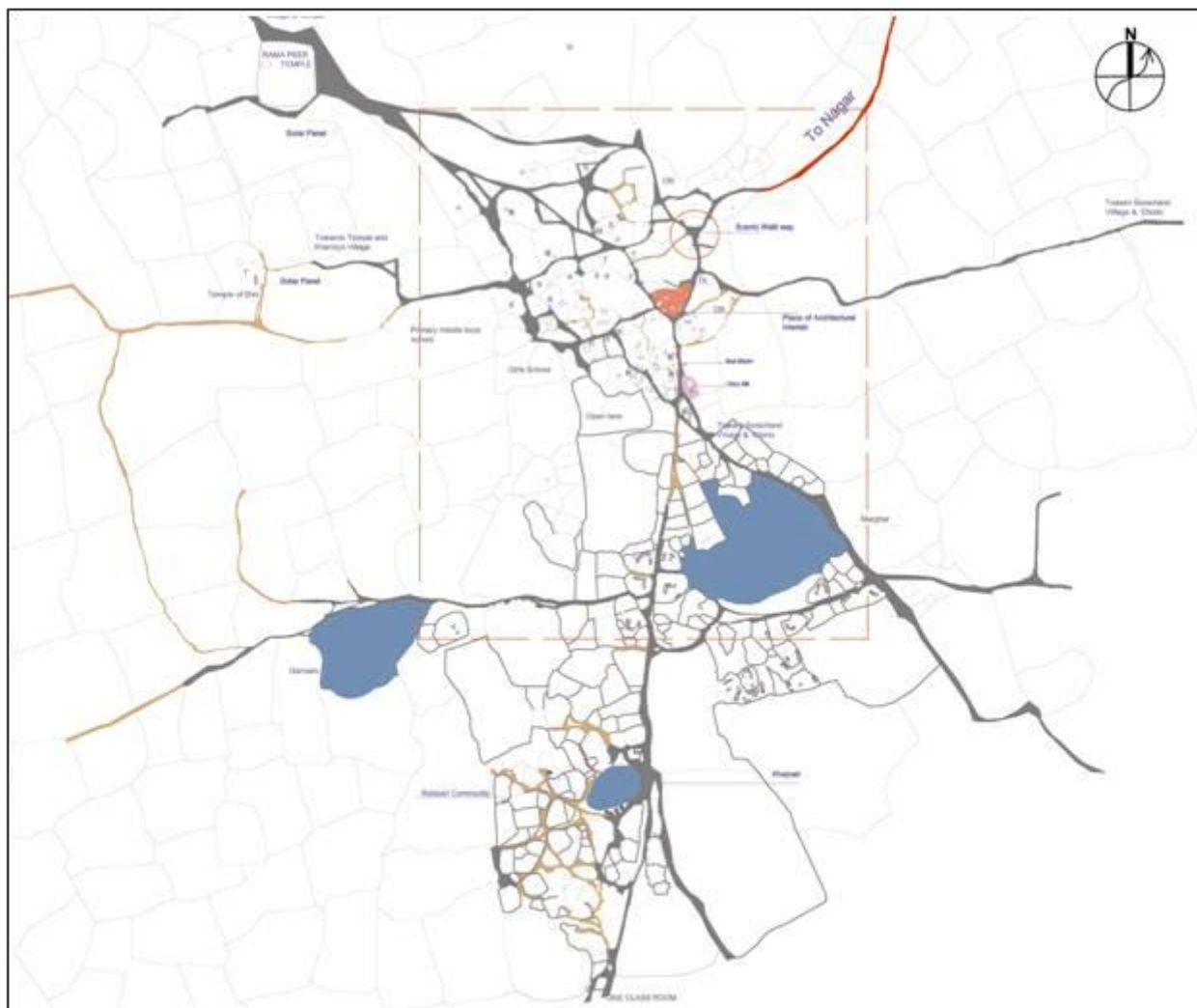


NAGARPARKAR EXISTING LAND OWNERSHIP

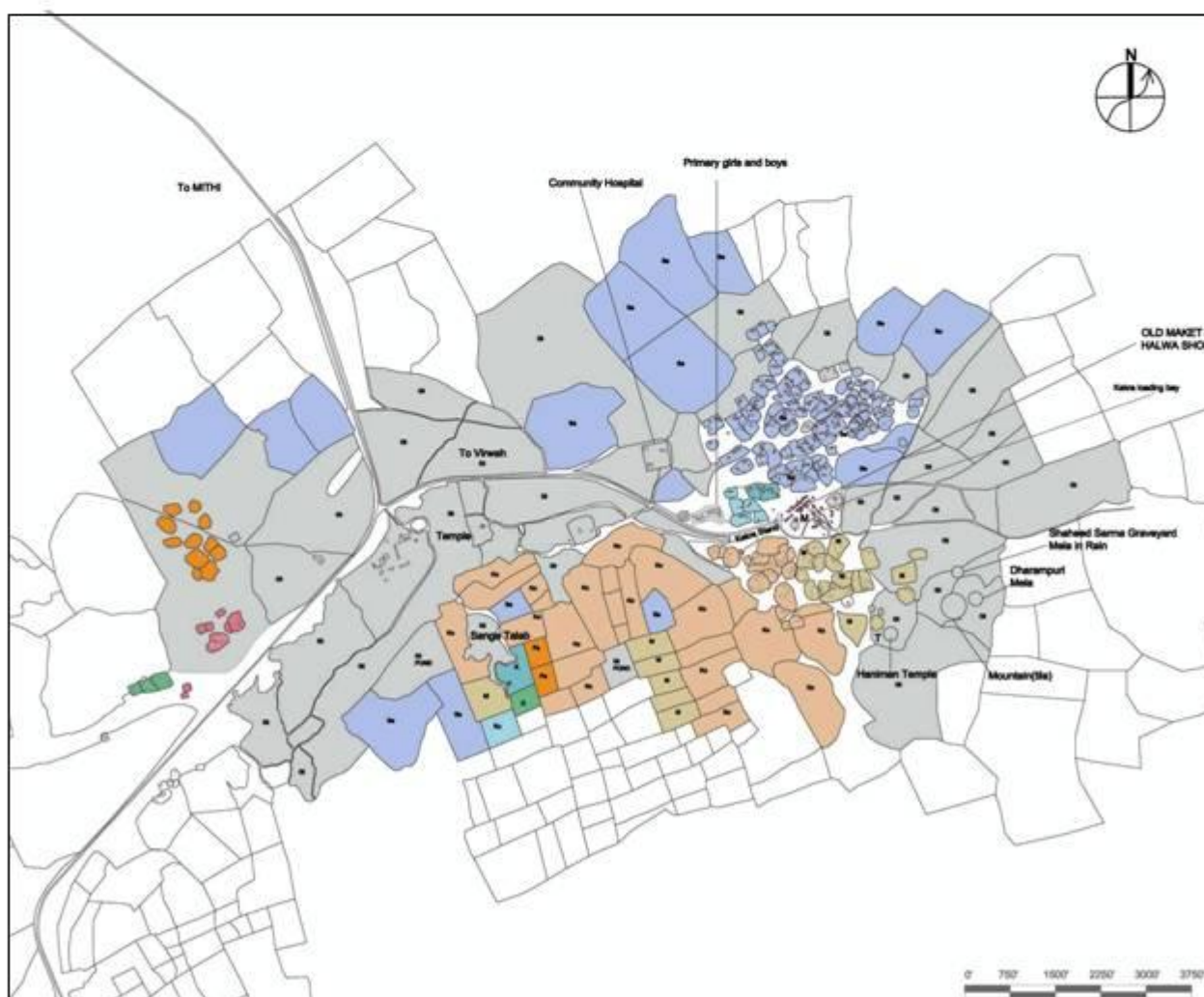
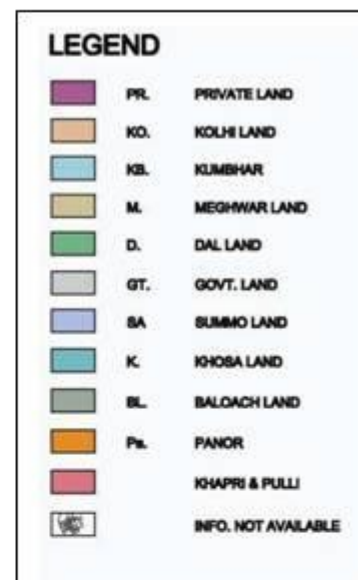
LEGEND	
	PR. PRIVATE LAND
	KO. KOLHI LAND
	KUM. KUMBHAR
	M. MEGHWAR LAND
	D. DAL LAND
	CH. CHARJUN LAND
	GOVT. LAND
	SU. SUMMO LAND
	KOLHI AND GOVT LAND
	K. KHOSA LAND
	KH. KHASHKHELI LAND
	P. PATHAN LAND
	S. SHEIKH LAND
	BL. BALOACH LAND
	BR. BARDHAMAN LAND
	F. FAGIR LAND
	T. THAKUR LAND
	TH. THEBA LAND
	KR. KHARAK LAND
	C. CHRISTIAN LAND
	Dwg no 18
	INFO. NOT AVAILABLE
	GRANITE HILLS



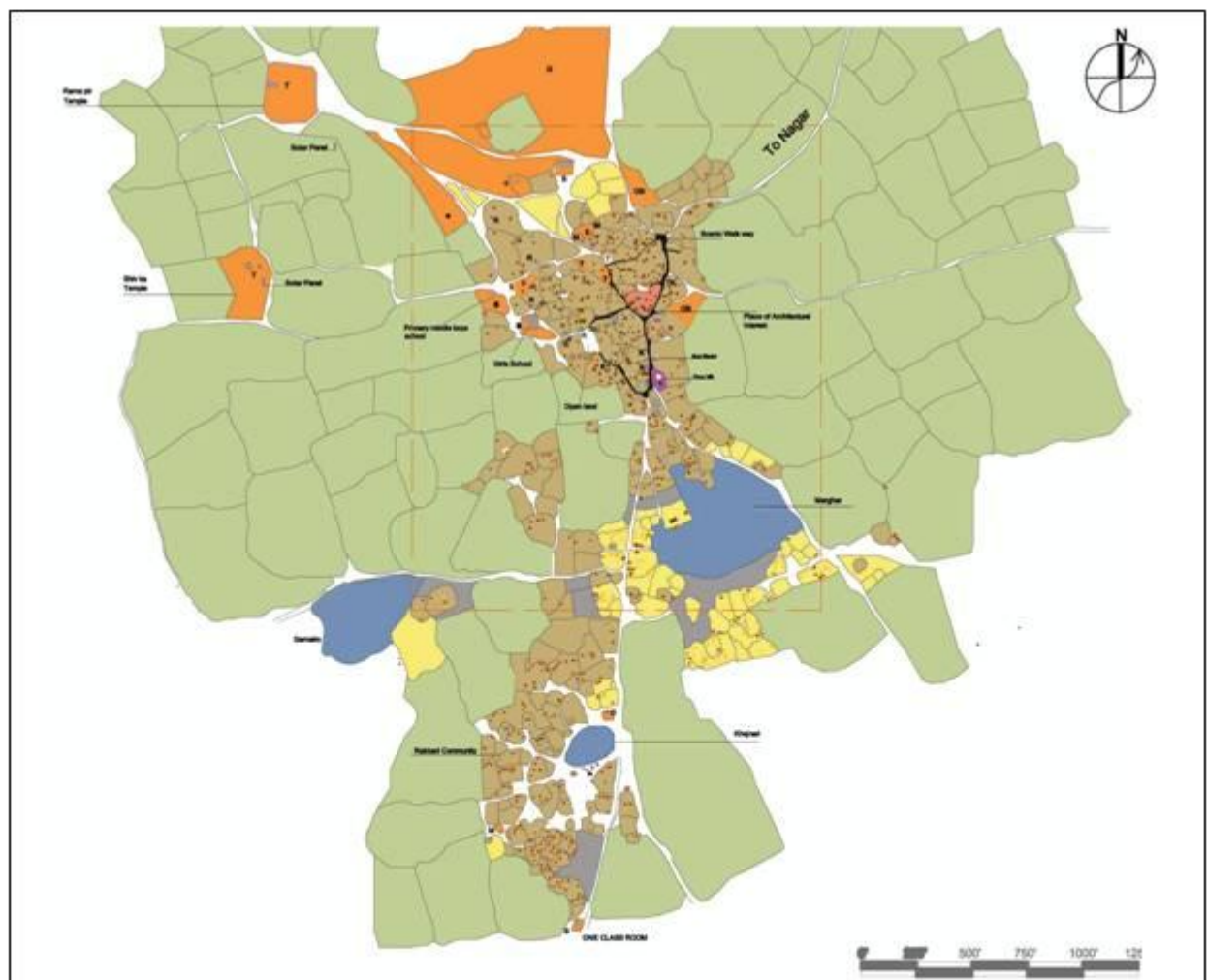
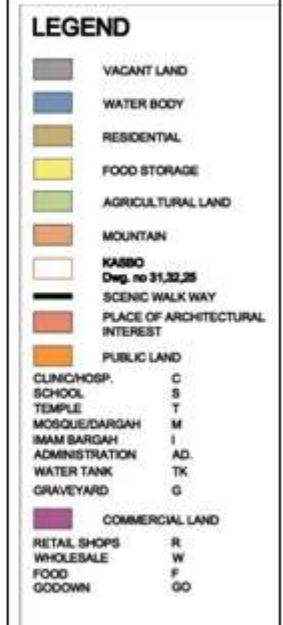
KASBO EXISTING TRAFFIC PATTERN



VIRAWAH EXISTING LAND OWNERSHIP



KASBO EXISTING LANDUSE



2. FINDINGS, RECOMMENDATIONS AND POSSIBLE PROJECTS

2.1 NAGARPARKAR TALUKA

2.1.1 Summary of findings

Details of the physical, socio-economic and governance issues in the Taluka as a whole have been recorded in Volume – One: Existing Conditions and Future Scenarios. A brief summary is given below.

- The history of the Taluka and its relationship to Gujrat and Kutch has been documented along with the socio-economic change that has taken place as a result of Partition and the two wars with India.
- In demographic terms the Taluka will have to cater to the needs of an additional 11,400 households by 2020. These do not include households/population that may be formed as a result of migration to the Taluka and the development of industry, coal and granite mining and fisheries.
- By 2020, 40,000 adolescents will be added to the population through natural growth. Structure plans for all settlements will have to set aside considerable space for the construction of educational institutions and women's hostels. 293 acres of land will be required for this purpose.
- The natural growth population by 2020 can be accommodated through the densification of existing settlements. However, space will have to be allocated for persons working in new job locations along with social and physical infrastructure. These requirements have been worked out in the report.
- Water supply and drainage requirements have been worked out for Nagarparkar, Virawah, Kasbo and Bodisar.
- Water supply schemes provided by local government have fallen into disuse because of their sophistication and management related issues. As a result, people have reverted to their traditional water sources. There is a need for the government schemes to be revived and handed over to the communities who appear willing to manage and operate them.
- Road paving schemes have not benefited local commerce because of their wrong locations.
- Land is being purchased for commercial and tourist related development along the main corridors connecting important villages and urbanising settlements. Construction on these sites will adversely affect the scenic quality of the built-environment.
- Heritage sites are being visited by an increasing number of tourists. These sites are unprotected and some of them have been subjected to vandalism like the Ghorī and Bodisar temples. Meanwhile, archaeological sites are being pillaged for construction material and new construction is taking place adjacent to them such as in Virawah.

- At a modest estimate, 75,000 persons per year visit Nagarparkar Taluka for tourist purposes. However, there is no tourist related governance or physical infrastructure in the Taluka settlements.
- An additional 75,000 persons visit the Taluka for religious functions and festivals. Their number is increasing as a result of the building of roads. The related temples and sites are under increasing population pressure and require new construction to accommodate pilgrims and the services sector that caters them. Additions to these sites are being made in an ad-hoc manner destroying heritage with inappropriate architecture such as at Sadhro temple site.
- It is estimated that by 2020, 400,000 tourists per year will be visiting the Taluka. If they spend Rs 500 each, their total spending will amount to Rs 200 million per year. If proper services can be provided, it is estimated that this figure can be more than tripled to Rs 600 million.
- The architecture of new buildings in the Taluka is not suited to the climate and is not in harmony in scale or style to the vernacular and folk architecture of the region. It is destroying the built-environment. These new buildings are houses built by people and government buildings such as schools, health facilities and offices.
- The traditional chura or hut has problems related to hygiene and high costs of roofing. In addition, the roof structure often catches fire causing considerable financial loss to the owners.
- Investments in infrastructure, especially roads, street pavements and water supply, have been made by government agencies. Many water schemes do not function any more and many street paving have not brought about much economic development or improvement which if properly selected, they would have.

2.1.2 Recommendations

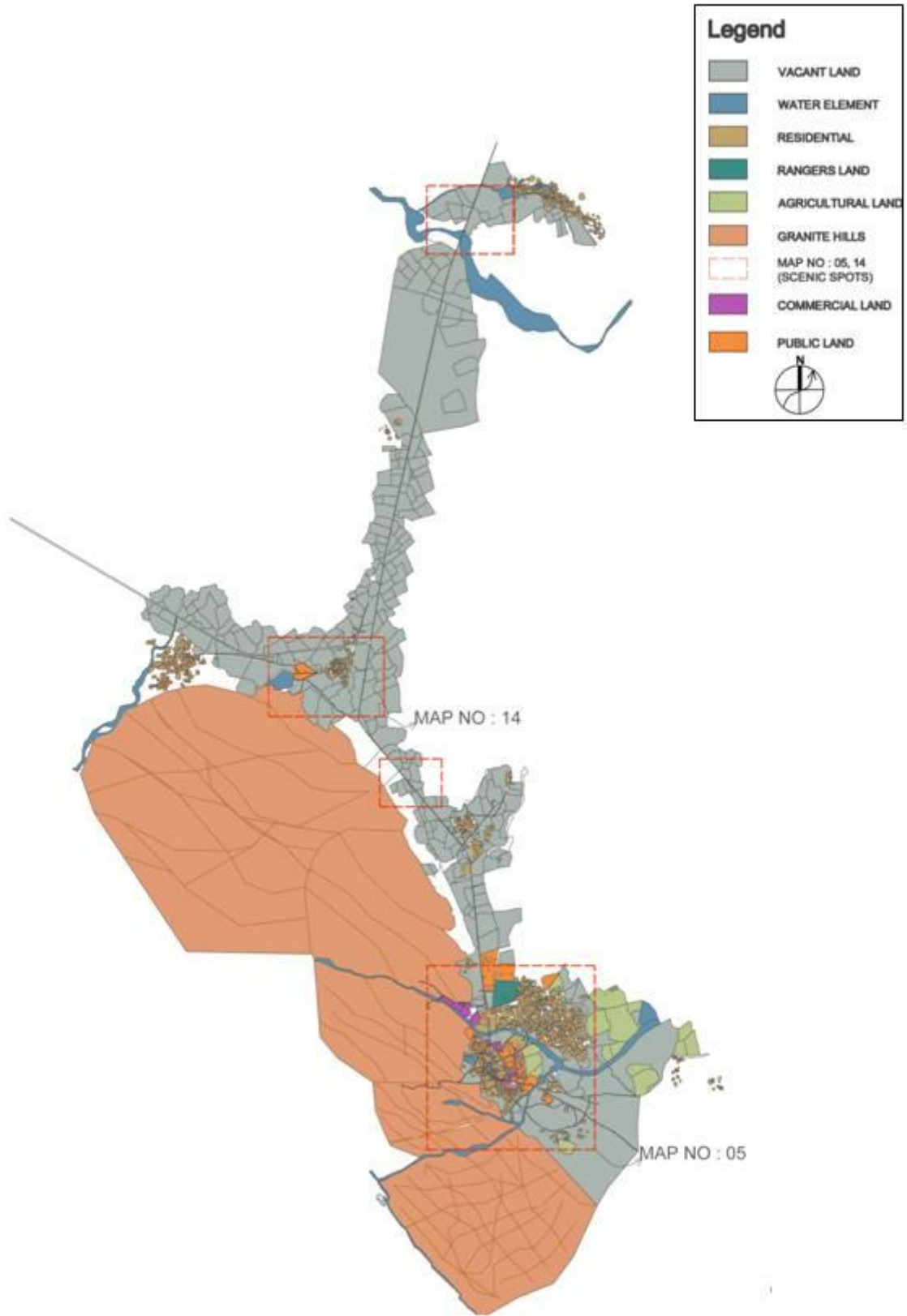
Based on a summary of the findings, the following recommendations have been developed:

- Scenic spots and vistas along the main corridors connecting various settlements need to be identified and protected especially on the Ghor-Virawah, Virawah-Nagarparkar, Nagarparkar-Kasbo and Nagarparkar-Churio corridors.
- A reservation area of 150 feet on either side of the existing roads needs to be created and protected.
- Road junctions on highways have to be protected from construction. An area of 500 metres to one kilometre radius around the junction should be protected so as to prevent the development of a settlement at that point which in turn would cause congestion and environmental degradation leading to the building of a bypass. This is a major problem facing road junctions in Pakistan.
- Plans for the preservation of heritage sites and master plans for pilgrimage sites need to be developed.
- No construction should take place within 150 metres of any archaeological or heritage site in the Taluka. If such construction is required for functional purposes, it should be low key and conservation consistent.

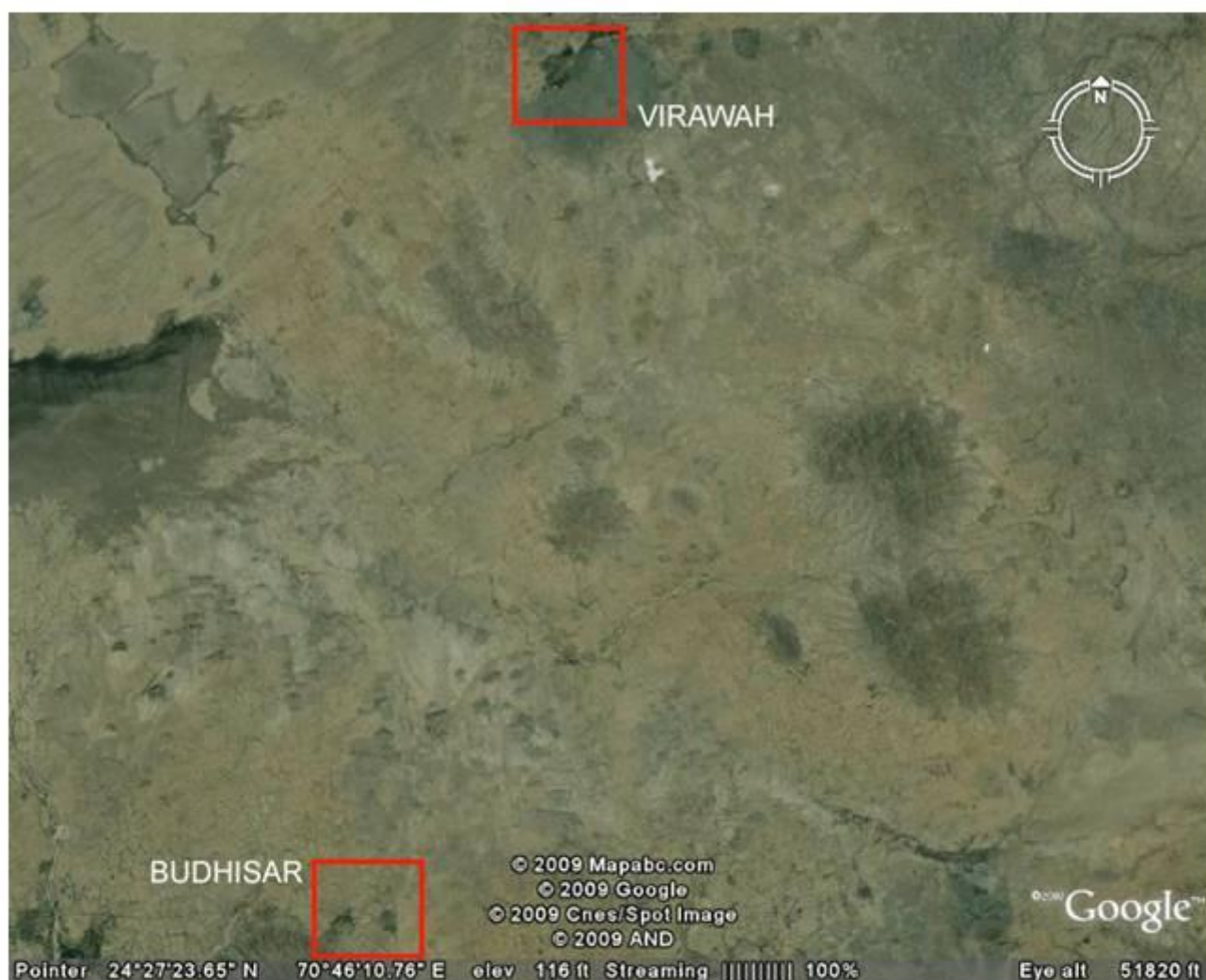
- Guidelines for architectural design and the design for a *chura* roof have been developed (see **Appendix – 1**). However, an understanding on institutional arrangements for their implementation needs to be discussed.
- Guidelines for sanitation (see **Appendix – 2**) and solid waste management (see **Appendix – 3**) have also been developed and favour the decentralisation and miniaturisation of governance systems and technology.
- A study of government water scheme should be made to determine their strengths and weaknesses in operation and maintenance (O&M). On that basis their design should be altered and their O&M issues resolved through decentralisation of technology, O&M and community involvement. For concepts of design for water schemes, see **Appendix – 4**.
- Plans for a governance structure and physical infrastructure for tourist related infrastructure should be established.
- Since most of the Taluka's settlements do not have electricity, the use of solar energy should be studied and promoted. This is already being done by TRDP but needs additional research and demonstration.

2.1.3 Scenic spots along the major road corridors in the Taluka

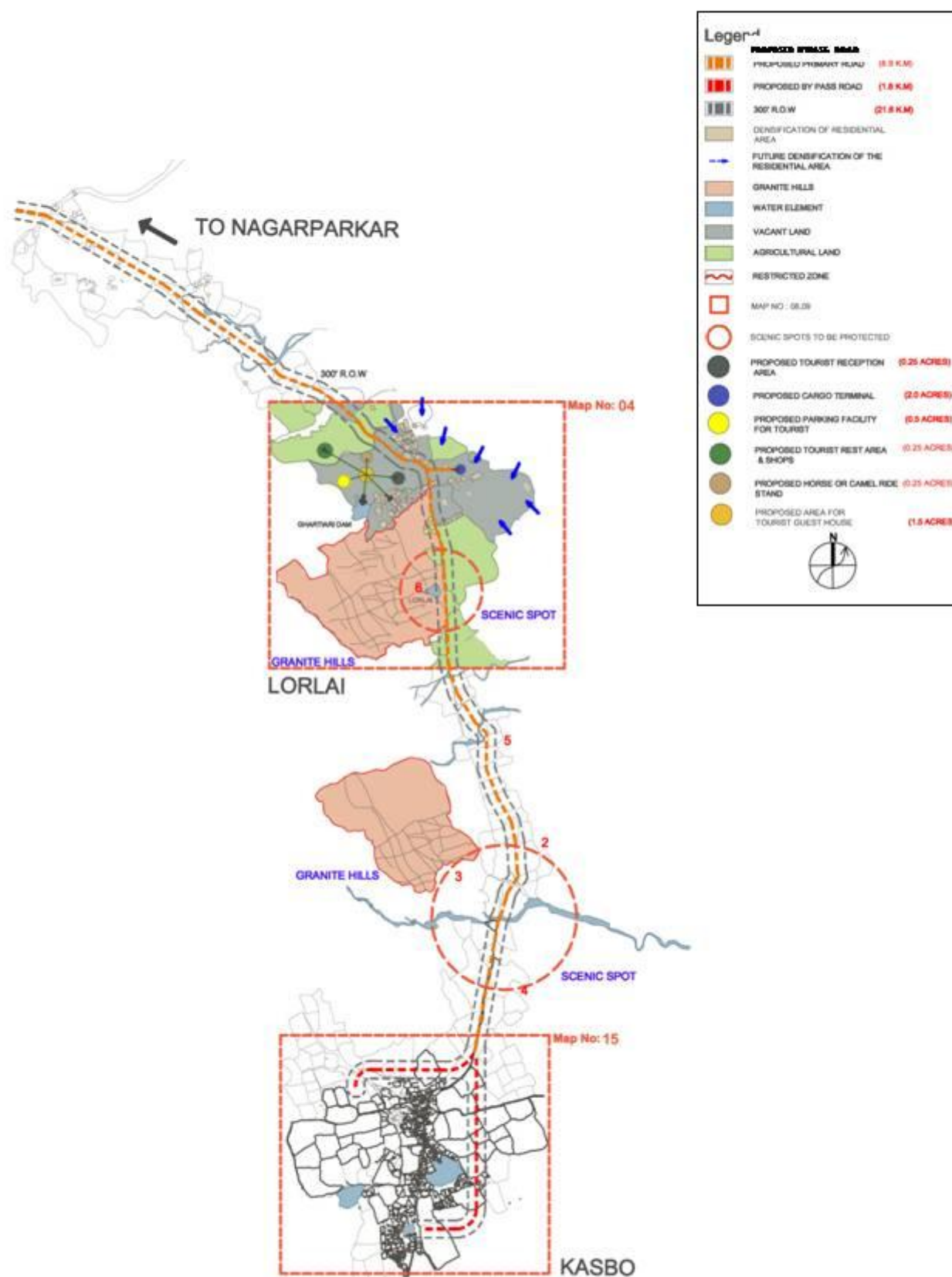
**EXISTING LAND USE AND SCENIC SPOTS ON THE
NAGARPARKAR - BUDHISAR CORRIDOR**



EXISTING LAND USE AND SCENIC SPOTS ON THE BUDHISAR - VIRAWAH CORRIDOR



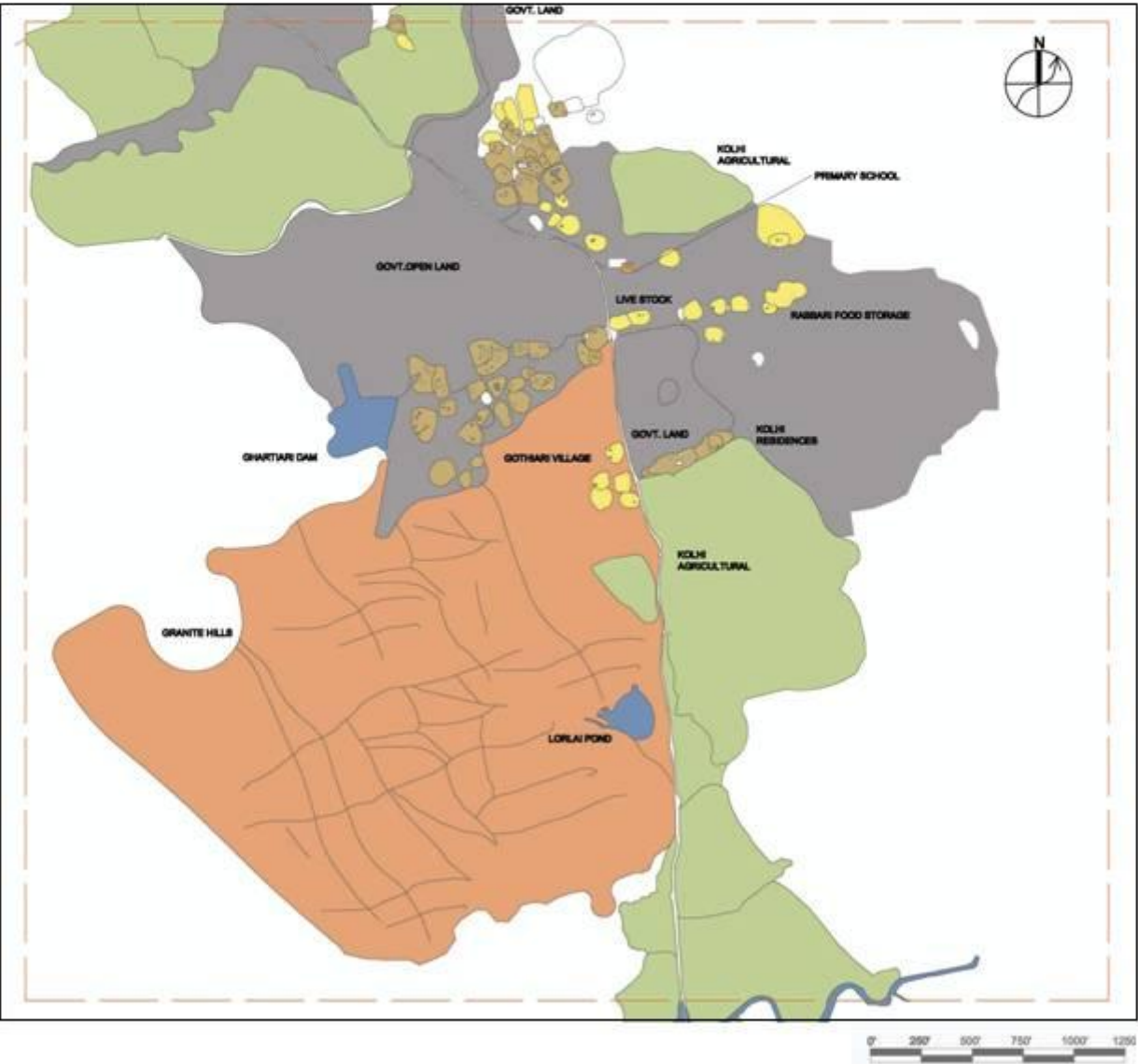
EXISTING LAND USE AND SCENIC SPOTS ON THE NAGARPARKAR - KASBO CORRIDOR



NAGARPARKAR - KASBO CORRIDOR IMAGES



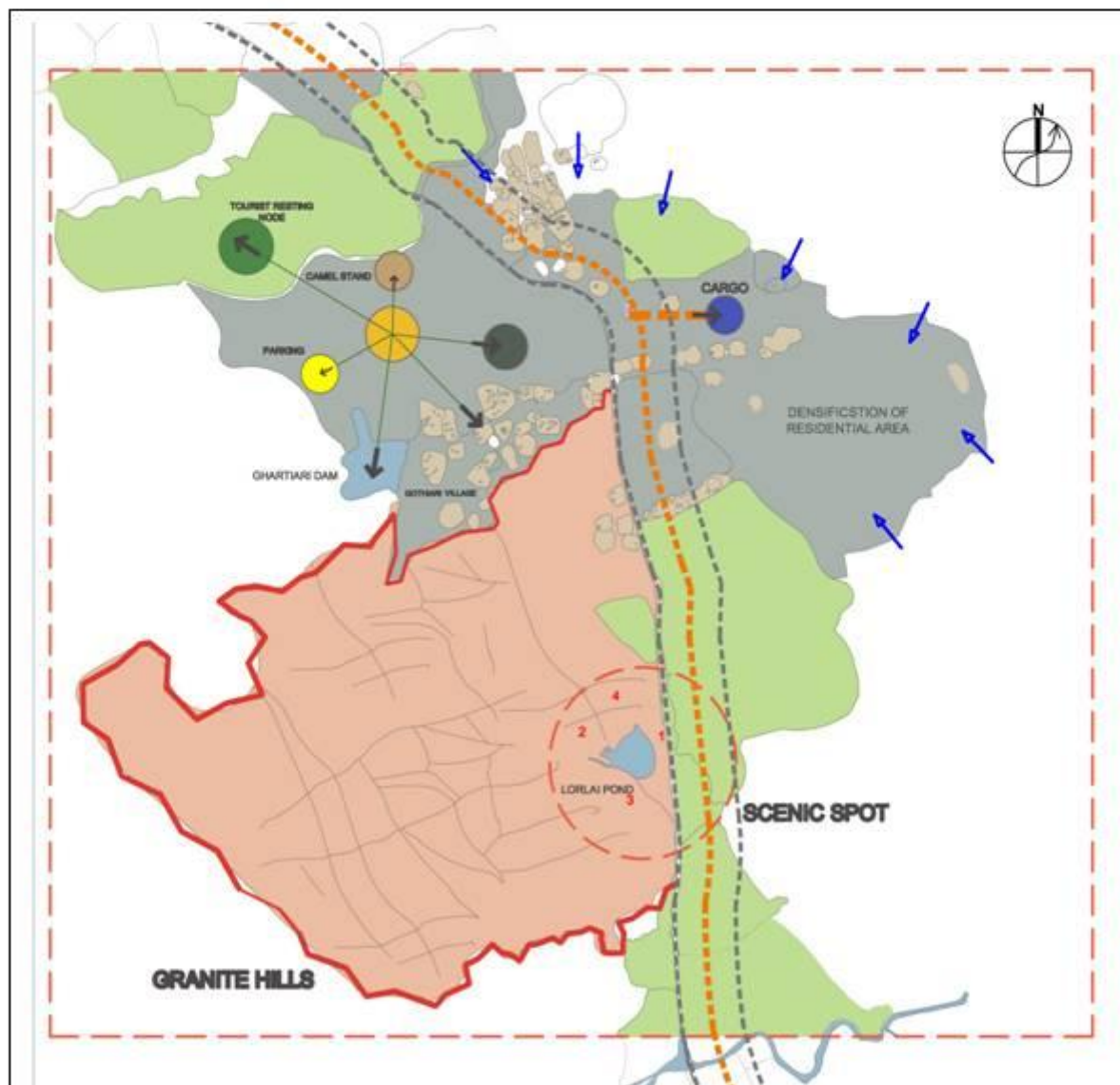
LORLAI EXISTING LANDUSE



LORLAI SCENIC SPOTS



LORLAI PROPOSED LANDUSE



2.2 NAGARPARKAR TOWN

2.2.1 Summary of findings

Details of the physical, socio-economic and governance related issues of Nagarparkar Town are contained in Section 3, Chapter 5 of Volume One: Existing Conditions and Future Scenarios. A summary of the important findings is given below.

- Current population of the Town is about 8,000. Given the 1981-1998 growth rate it will be around 11,000 in 2020. Given the building of the coastal highway, expansion of granite and coal mining, and tourism, along with the possibility of Nagarparkar Taluka becoming a separate district with the town as its headquarters, the likely population in 2020 will be about 40,000 at a modest estimate.
- At present the Hindu population of the Town is 70 per cent. However, with the influx of mining and tourism (and possibly fisheries) the Hindu population is likely to decrease in percentage terms. Therefore, it is necessary that the town and the Taluka maintain and further develop a tolerant political and social culture. This can be achieved to the promotion of its folklore, history and its places of religious heritage.
- By 2020, an additional 3,680 households will be added to the town population. In addition, 100,000 tourists per year will be passing through or visiting Nagarparkar Town. Although housing requirements through natural growth can be accommodated in the various paras along the core of the town, housing and related facilities for the additional population and tourists will have to be provided. **An area of 130 acres will be required for this.**
- Schools for a school age going population of 9,000 will have to be developed by 2020. Space for this expansion will have to be provided along with hostels (especially for girls) for students from out of the town locations. In addition, teacher's training and health related institutions and facilities will also be required and space for them and other government institutions has to be identified. 26 acres will be required for these institutional buildings.
- There are important heritage sites with the town. These include the old bazaar, an ancient Jain temple which is in a terrible state of repair, the old Mukhtarkari and an additional two temples and houses near the bazaar.
- The town is expanding along the Nagarparkar-Bodisar Corridor. As a result of this expansion, the old town will be abandoned and turned into a slum. Katchi abadis will be developed in it and this will adversely affect the heritage sites and access to them. This pattern of development has already happened in Mithi and is taking place in Islamkot.
- The area between the old bazaar and the area where government institutions are located, is becoming the transport hub of the town. This is creating unplanned development within the Town centre to service the hub and is causing congestion and environmental degradation.
- As always happens in such cases, the transport terminal will be shifted eventually to a bypass where new commercial development will take place which will further

marginalise the existing town unless physical and economic links with it and the government institutions and the old town structure are created.

- Water requirements of the Town by 2020 will be 300,000 gallons per day. It is unlikely that the shallow rainwater aquifer can supply this amount of water. Other sources will have to be identified.
- Sanitation today consists almost entirely of soak pits. These are bound to have adverse affect on the quality of the rainwater aquifer. To prevent this, a sewage system with a treatment disposal is required. In addition, the volume of solid waste is bound to increase and a public-private partnership for its disposal and the development of the landfill sites is required.
- The local government institutions are weak and do not have the necessary human and financial resources to develop, manage and maintain required infrastructure.
- Towards the north of the Town is the Karunjhar Range. Within it two important heritage sites are located. These are:
 - Sadhro Temple: This is about 3 kilometres from Nagarparkar. The legends and rituals attach to it have been documented. The religious festivals of Shiv ka Mela and Kathi Katak Ashnan Mela bring over 50,000 pilgrims every year to this site. A number of buildings relate to the rituals performed here. There is a need for conservation consistent new buildings and facilities.
 - The other site is Anchlisar where there is a ling of Maha Dev. Inappropriate construction and desecration of the site is taking place along with solid waste accumulation.
- The Karunjhar Range has been declared a national park. However, the process of treating it as such has not yet been put in place.
- The Karunjhar Range begins immediately north of the old bazaar which is the northern extremity of the Town. Further expansion of the Town towards the north would adversely affect the scenic quality of the region.

2.2.2 Recommendations

- i) A landuse and road proposal (2010-2020) has been prepared for Nagarparkar Town in which growth directions have been identified. This landuse plan proposes and/or identifies locations of:
 - A bypass to Kasbo and Churio, with separate cargo and passenger terminals on it. **4 acres will be required for the two terminals.**
 - A dam on the Bhattiani Nala with a road, shops and recreational areas on it linking the passenger terminal to the government institutional area.
 - Road rationalisation into primary, secondary and tertiary roads to make the landuse proposals workable.
 - Densification of the existing government institutional area and its expansion to the south on land acquired for this purpose. **15.6 acres of land will have to be acquired for this function.**

- Conversion of the area between the old bazaar and the area for government institutions into an area for the development of tourism related infrastructure consisting of shops, crafts centres, hotels and residential accommodation with soft landscaping and pedestrian areas and with conservation consistent architecture.
 - A conservation plan for the old bazaar and the temples located in and around it.
 - Locations of new housing schemes. All of these are allocated on government owned land.
 - Development of water and sanitation plans for the Town and a comprehensive community based solid waste management programme as defined in **Appendices – 2, 3 and 4.**
- ii) Other interventions:
- Incentives, infrastructure and proposals for the promotion of Tharri art and culture
 - Stopping the growth of the Town to the north so as to protect the scenic area in the Karunjhar hills
- iii) Institutional arrangements both within TRDP and government agencies will have to be developed for the implementation of the recommendations.

2.2.3 Projects that come out of the recommendations

i) Immediate projects:

- Study for the conservation and conversion of the old Mukhtarkari into a Nagarparkar Taluka Museum
- Plans for the development of a cultural precinct around the old Mukhtarkari including the building of an open amphitheatre.
- Plans for the creation of a zoo in the Karunjhar National Park at a distance of not more than three kilometres from the centre of the Town.
- Documentation and preparation of a conservation plan for the Jain temples in the bazaar.
- Development of a proposal for the documentation and conservation of the old bazaar and its related structures.
- Development of an institutional arrangement through a TRDP-government partnership for the implementation of the above projects.

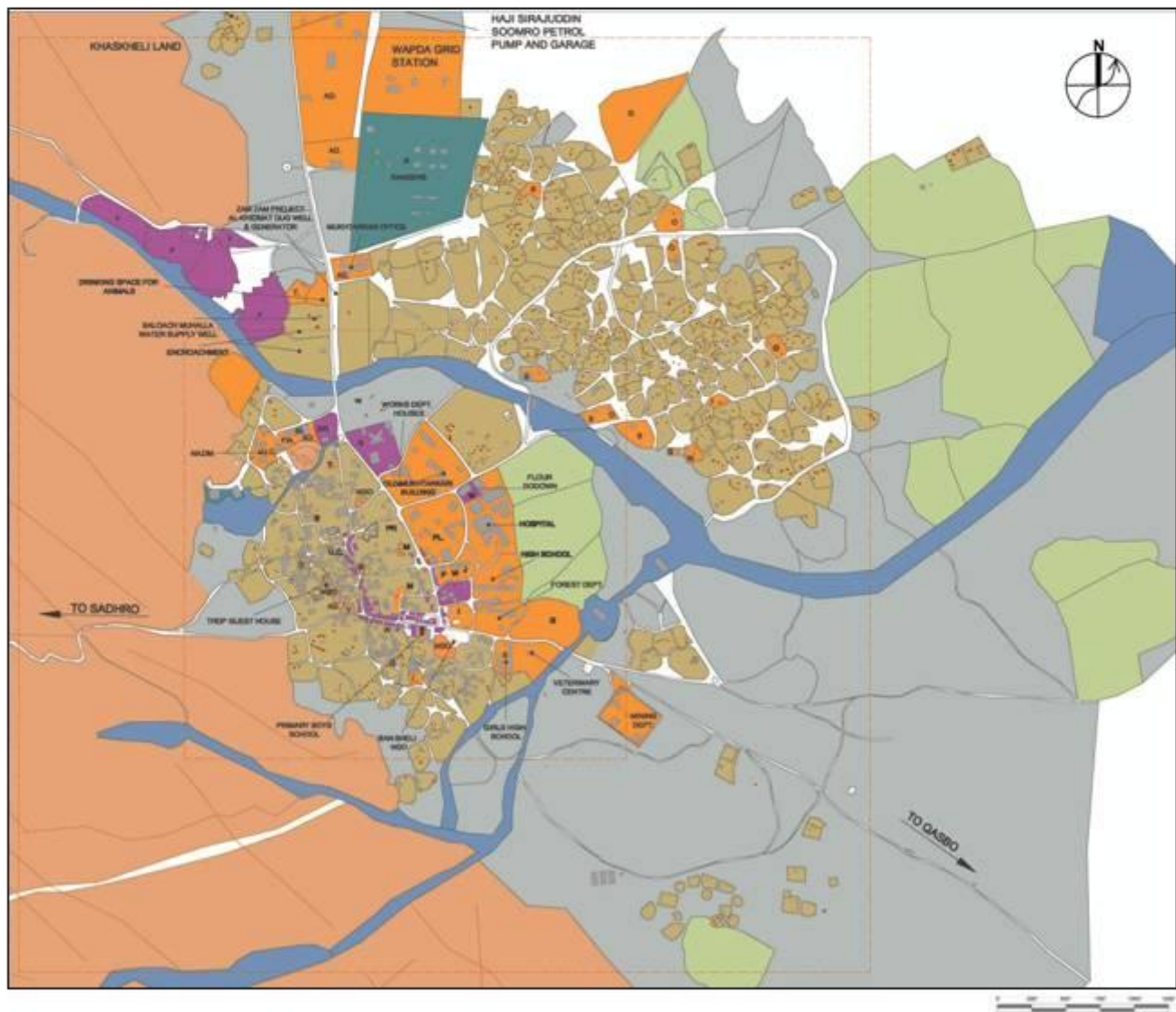
ii) Later projects for which studies can be initiated on the basis of the concepts that have been developed:

- Bypass to Kasbo and Churio
- Cargo and passenger terminals and facilities related to them

- The building of the dam on the Bhattiani Nala and the proposed road network
- Housing projects at the identified locations for low income groups
- Water, sanitation and solid waste management projects

2.2.4 Maps and photographs of Nagarparkar Town for the following:

NAGARPARKAR EXISTING LANDUSE



NAGARPARKAR



Granite Hills



Granite Mining



Nagar Bazar



School



China Clay Factory



Hospital

NAGARPARKAR



Old Nagar Bazar



Conservation Building



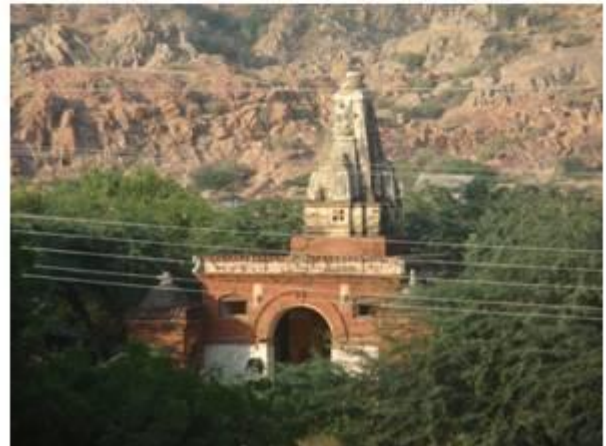
Temple



Jain Temple

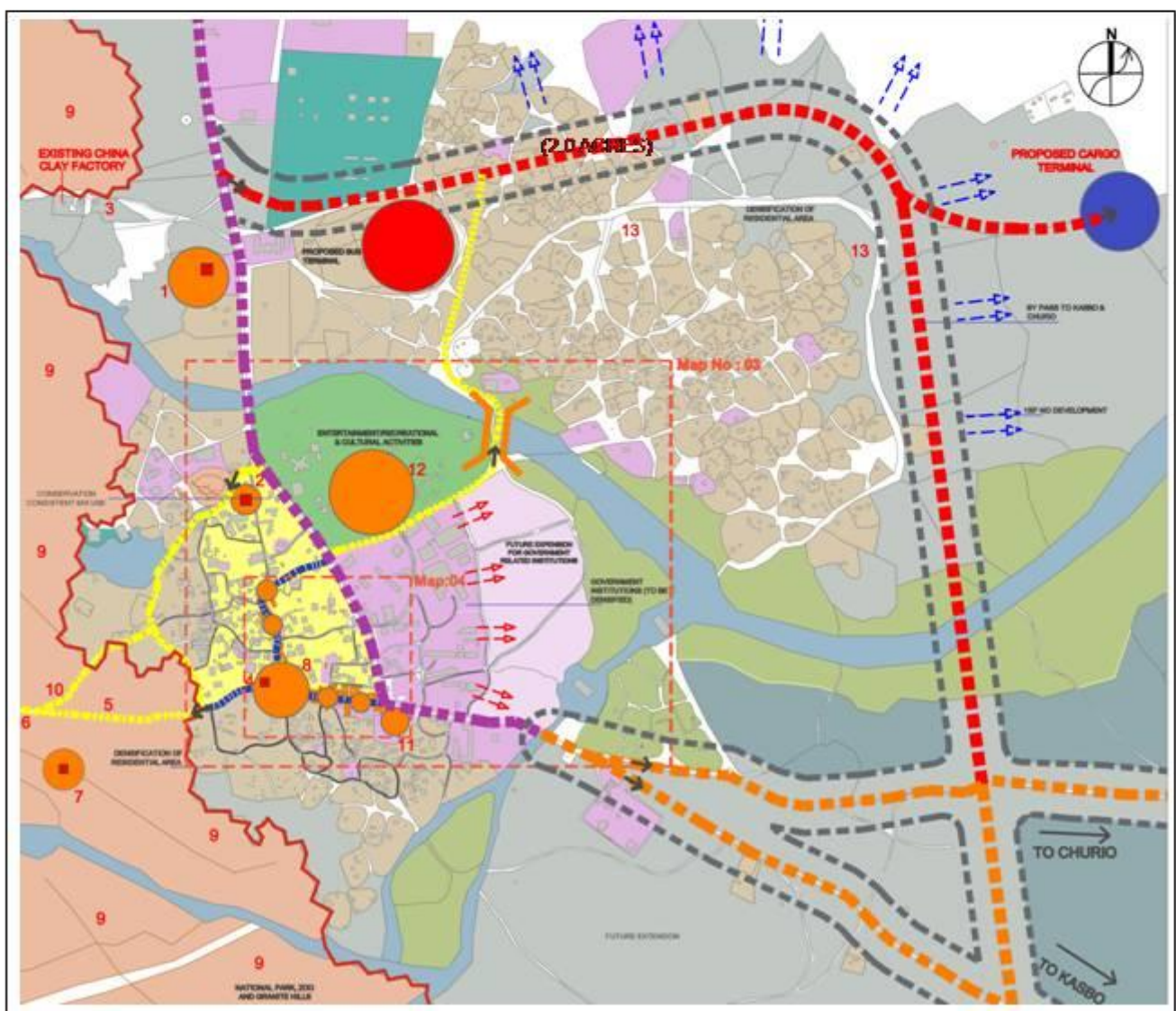


Temple

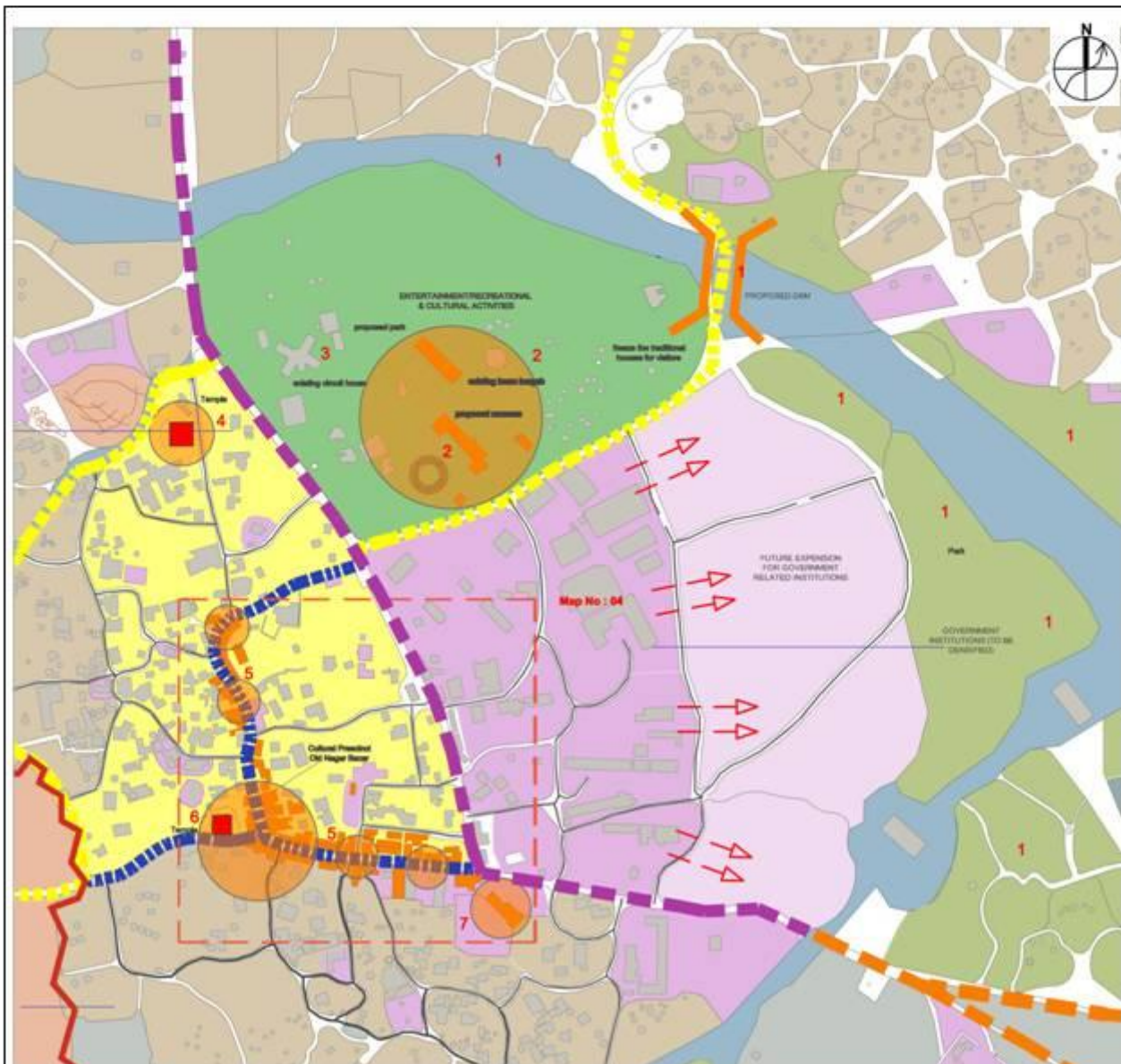
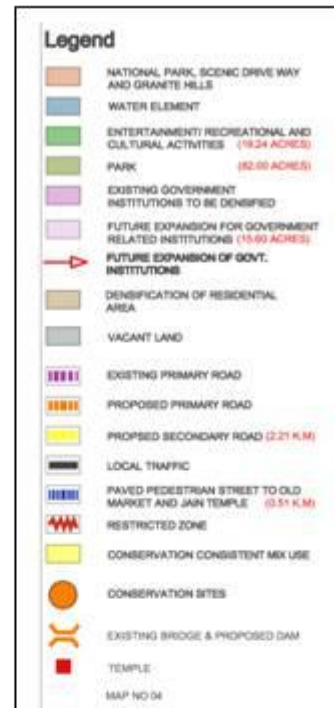


Temple

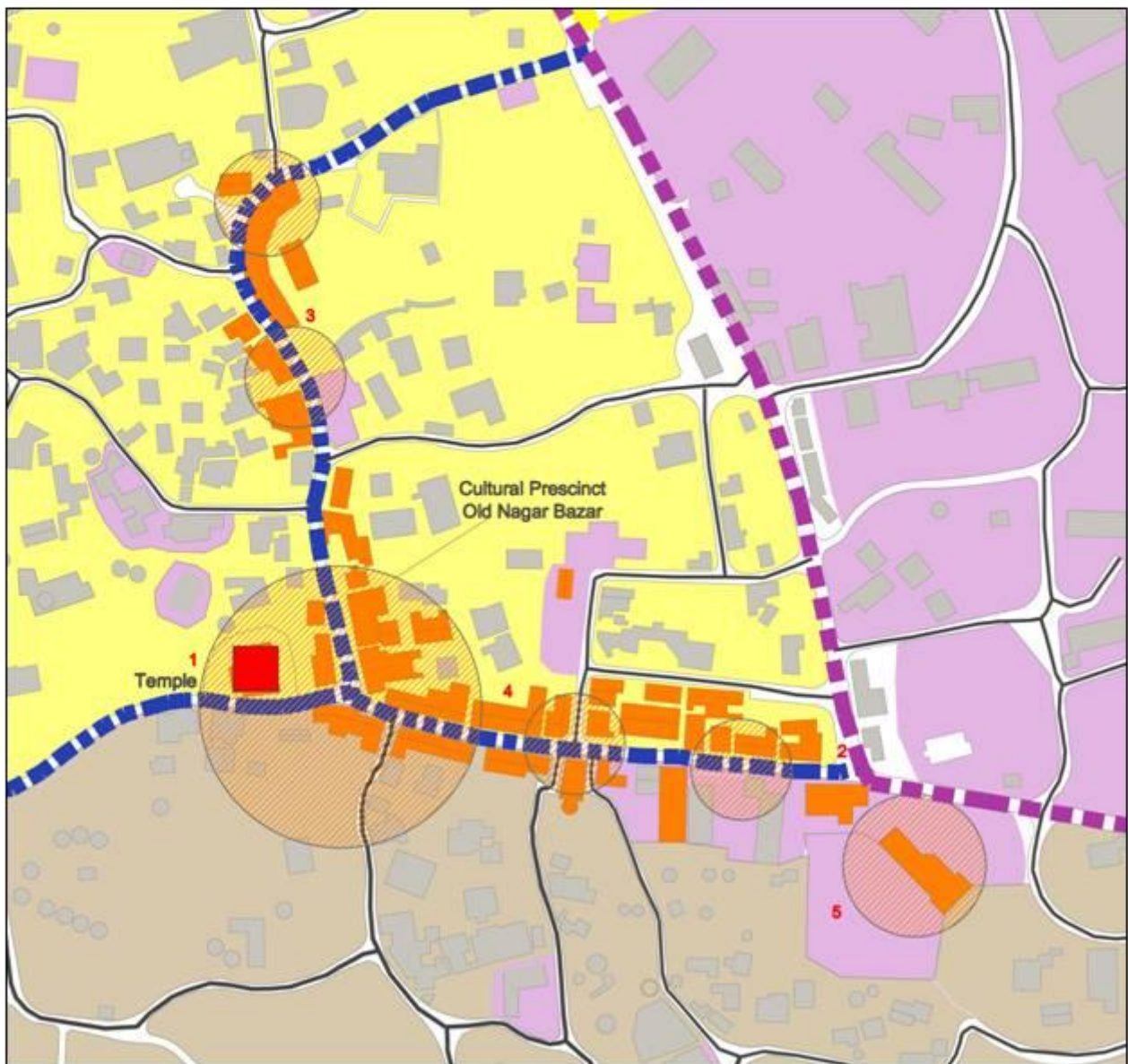
PROPOSED GENERAL LANDUSE



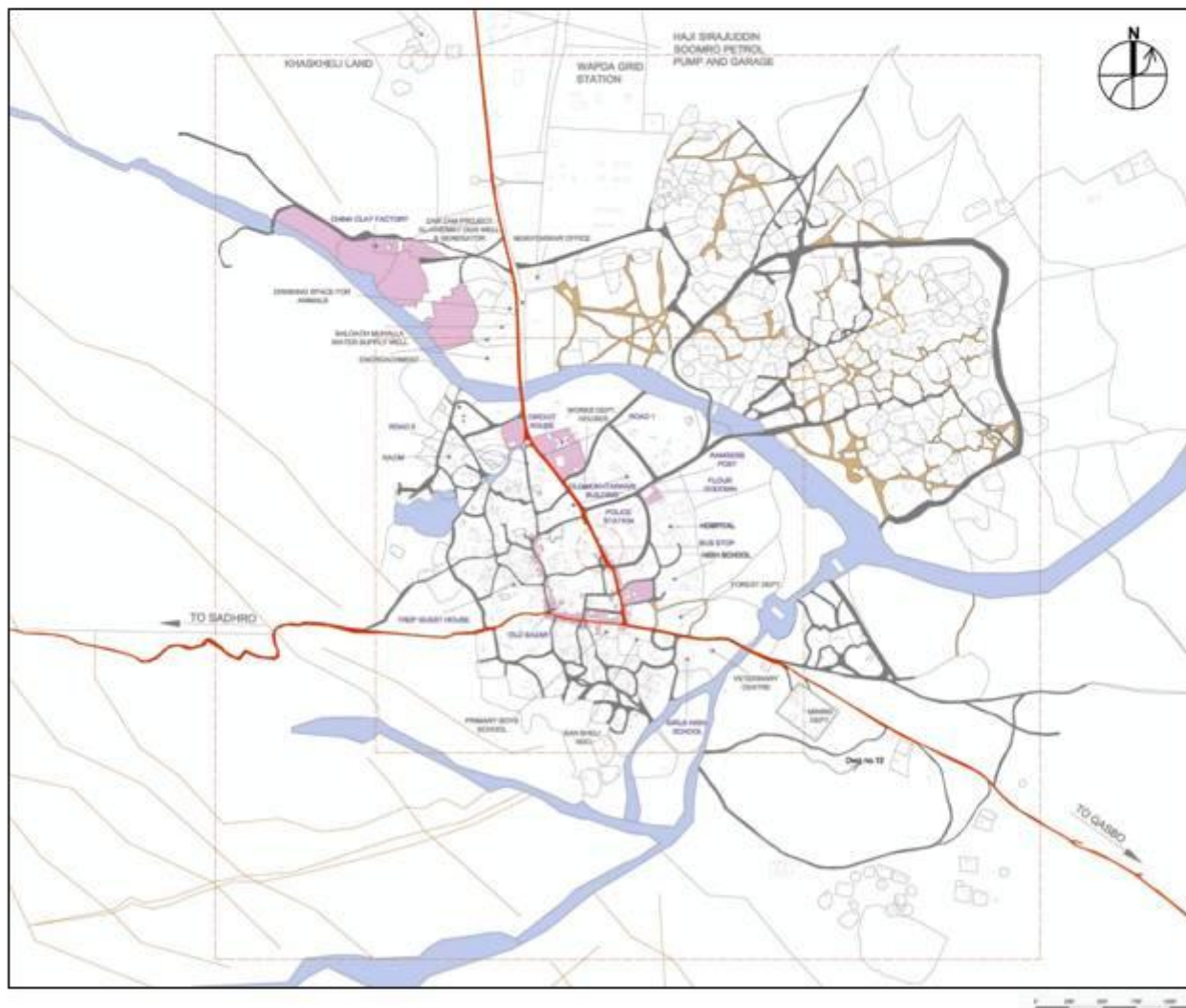
PROPOSED SPECIFIC LAND USE - 1



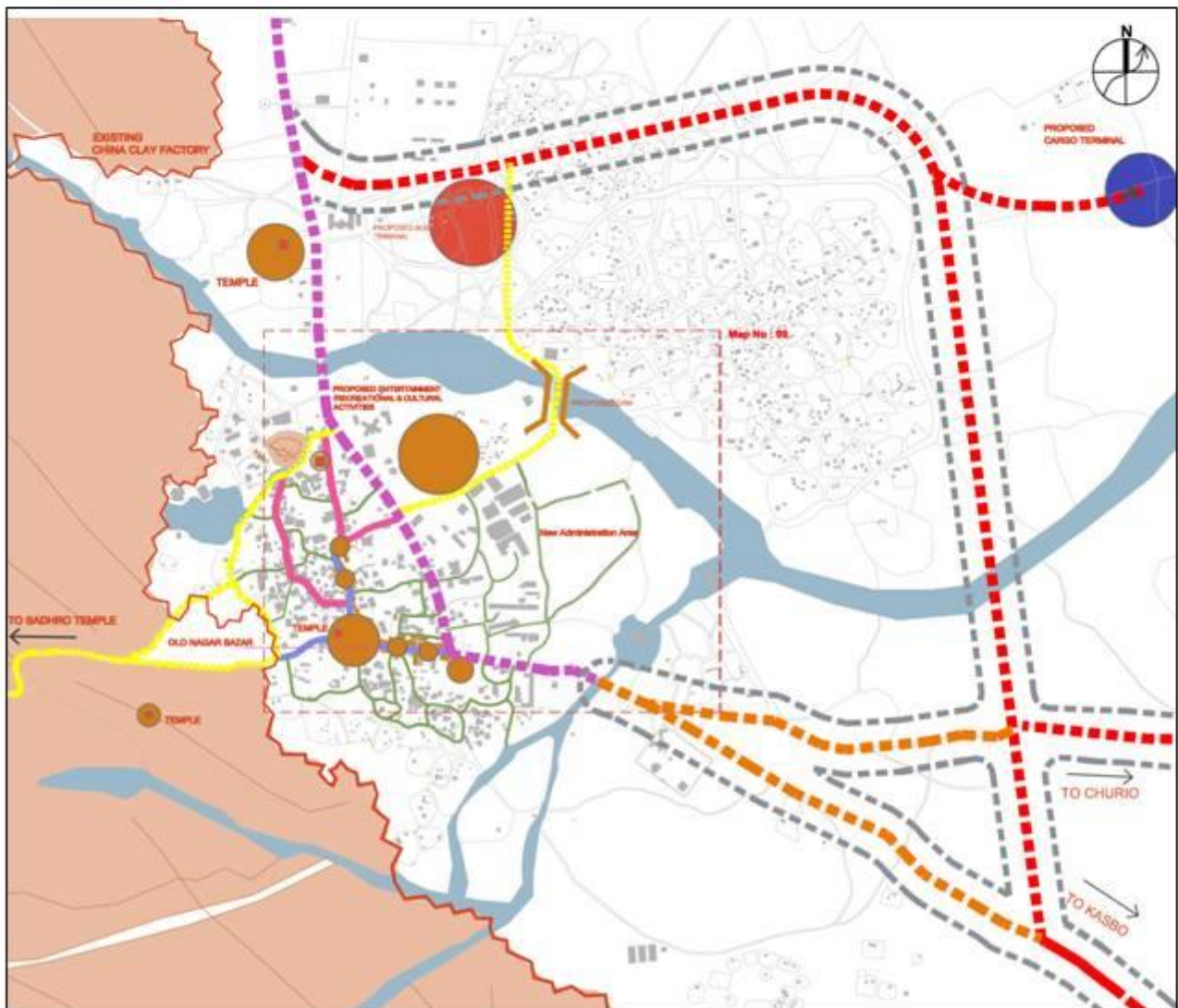
PROPOSED SPECIFIC LANDUSE - 2



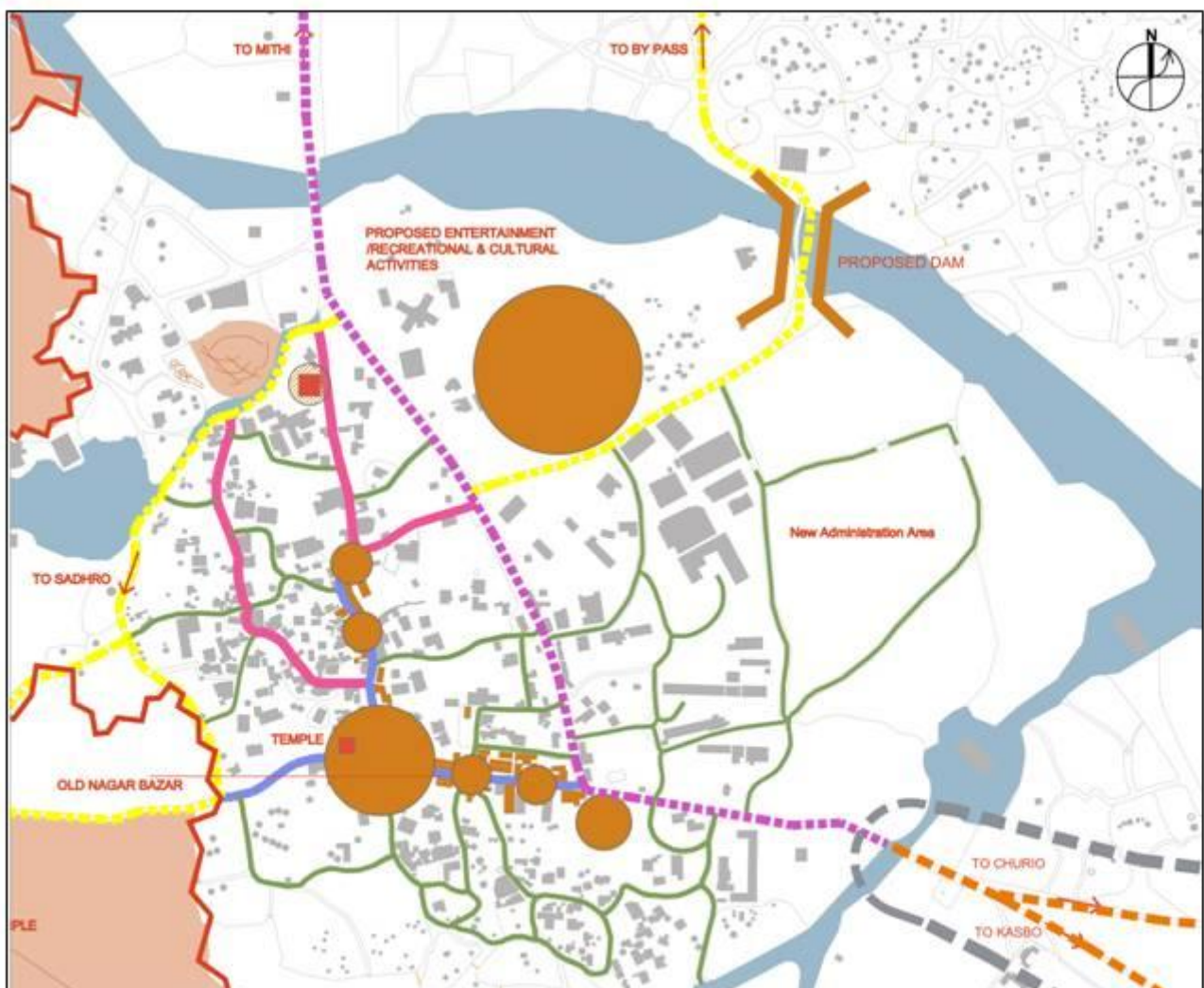
EXISTING TRAFFIC PATTERN



PROPOSED TRAFFIC PLAN



PROPOSED TRAFFIC PLAN : AREA DETAILS



2.3 VIRAWAH VILLAGE

2.3.1 Summary of findings

Details of the existing demographic, socio-economic, physical conditions and heritage related sites have been covered in detail in Section 5, Chapter 5 of Volume One: Existing Conditions and Future Scenarios. A summary of the more important findings is given below:

- Virawah's population today is 9,200. By 2020, it will be 11,250 through natural growth. However, given its strategic location and its agricultural and livestock production potential, it is estimated that in 2020 it will have a population of at least 15,000.
- 300 extra households as a result of natural increase can be accommodated through densification of the existing paras. Space for an additional 3,000 population will be required along with space for education and health facilities.
- Government related facilities and institutions are being developed near the village on the north side of the road that links the village with the Mithi-Nagarparkar Highway. There is considerable space for densification of this area which will meet all requirements till 2020.
- Virawah has major economic activity related to agriculture and livestock. Estimates for this have been acquired and there are 20 to 25 bayparis from the village who acquire and transport animals and produce from the village to Karachi and other Sindh towns.
- The village has two points from which bayparis load animals into vehicles. These points need to be relocated for convenience and developed so that this activity can be facilitated. 20 to 25 trucks and kekras come to Virawah every day for transporting crush, china-clay and animals. Their drivers and conductors stay in the bazaar and the vehicles park wherever there is space. There is a need for a proper organisation of transport and driver's accommodations.
- A major product of the village is *mawa* which is purchased in a big way by the visitors to the village and to the neighbouring historic sites.
- There are five dug wells in the village but the water is brackish. A government water supply scheme gets water from 6 kilometres away through a piped system but the scheme functions erratically and is usually non-functional. As a result, women walk about two kilometres to fetch water from a Ranger's post.
- There is no sewage system in the village except for seven soak pit latrines. The rest of the village goes to the fields due to which there are increasing problems for women. There is no solid waste management system either and nor is there any electricity.
- Virawah is a historic site and contains
 - The remains of Parinagar port (5th – 12th century AD)
 - An important 13th century Jain temple
 - Site of old Virawah
 - The Dhramपुरi Temple
 - The Shaheed Samma Graveyard (12th century)

- About 3,000 cars and motorcycles came to the village to visit these sites during the long weekend of August 14, 2008. An addition, 2,000 persons visit it during the mela around the Samma Graveyard and an additional 2,000 for the Dhramपुरi Mela. Pilgrims visiting Sadhro also stop to visit the religious sites and to buy halwa.
- The Jain Temple is in a bad state of repair and is difficult to access. The site of old Virawah is being pillaged for construction material. To access the Dhramपुरi and Hanuman mandirs and the Shaheed Samma Graveyard, one does not need to pass through the village bazaar and as such the village does not benefit from the visitors.
- At a distance of 2-1/2 kilometres from the village is the folkloric site of Silver Sarnath. It is also visited by persons passing through the village on the way to Nagarparkar and Sadhro.
- There is no tourist related governance or physical infrastructure in or around the village.
- Local government has invested in street paving but has not related this to economic well being and promotion of local commerce.

2.3.2 Recommendations

- i) A proposed landuse plan (2010-2020) has been prepared for the village. It proposes and/or identifies the locations for:
 - A road from the access road through the bazaar to the sites of old Virawah Dhramपुरi and Hanuman mandirs and the Shaheed Samma Graveyard. This would force visitors to go through the bazaar.
 - Paving of the main bazaar to make it attractive for visitors for shopping, recreational and eating activities.
 - Demarcation and protection of archaeological sites from pillage and vandalism.
 - Restoration of the Jain Mandir and its immediate environment
 - Location for the development of rest houses and residential accommodation for tourists
 - Location for the development of a cargo and truck terminal
 - Introduction of solar energy components
 - Revitalisation of the government water supply scheme
- ii) Other interventions:
 - Creation of an information centre for tourists
 - Creation of training facilities for locals as tourist guides and staff for tourist related facilities

- A programme for the promotion of melas and the development of environmentally sensitive infrastructure for them
- Initiation of discussion and dialogue for a TRDP-government partnership to make the recommendations implementable.

2.3.3 Projects that come out from the recommendations

i) Immediate projects:

- Jain Temple restoration and access development
- Road through the bazaar to the heritage and religious sites
- Paving of the bazaar road to create interest for tourists
- Setting up of a tourist information centre along with a programme for training of guides and staff for tourist related activities.
- Establishing a TRDP-government dialogue for creating necessary governance structures for the implementation of the above.








ii) Later projects for which studies can be initiated on the basis of concepts that have been developed:

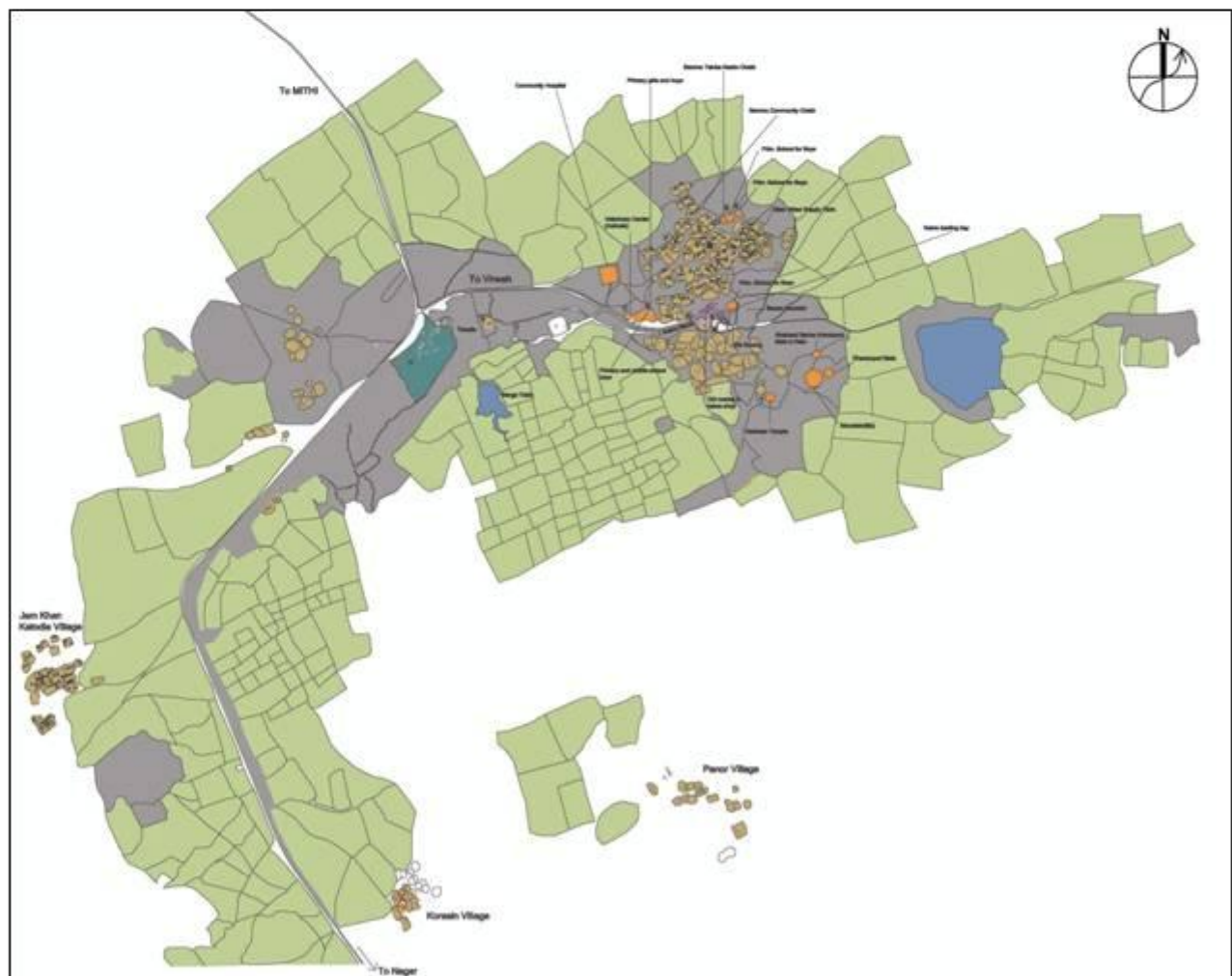
- Rest houses and residential accommodation for tourists
- Restoration of the government's water supply scheme and the development of a model for community-government partnership for its management, operation and maintenance
- Community based sanitation and solid waste management programme
- Truck terminal and cargo handling infrastructure

2.3.4 Maps and photographs for Virawah

VIRAWAH EXISTING LANDUSE

LEGEND

	VACANT LAND
	WATER BODY
	RESIDENTIAL
	RANGERS LAND
	AGRICULTURAL LAND
	PUBLIC LAND
CLINIC/HOSP.	C
SCHOOL	S
TEMPLE	T
MOSQUE/DARGAH	M
GRAVEYARD	G
OTAQ	O
ADMINISTRATION	AD.
	COMMERCIAL LAND



VIRAWAH



Agricultural Land



Agricultural Land



Sanga Pond



Govt. Institutions



Eid Gah



Virawah Bazar

VIRAWAH



Pari nagar



Main Jain Temple



Scenic walkways



Archeological zone

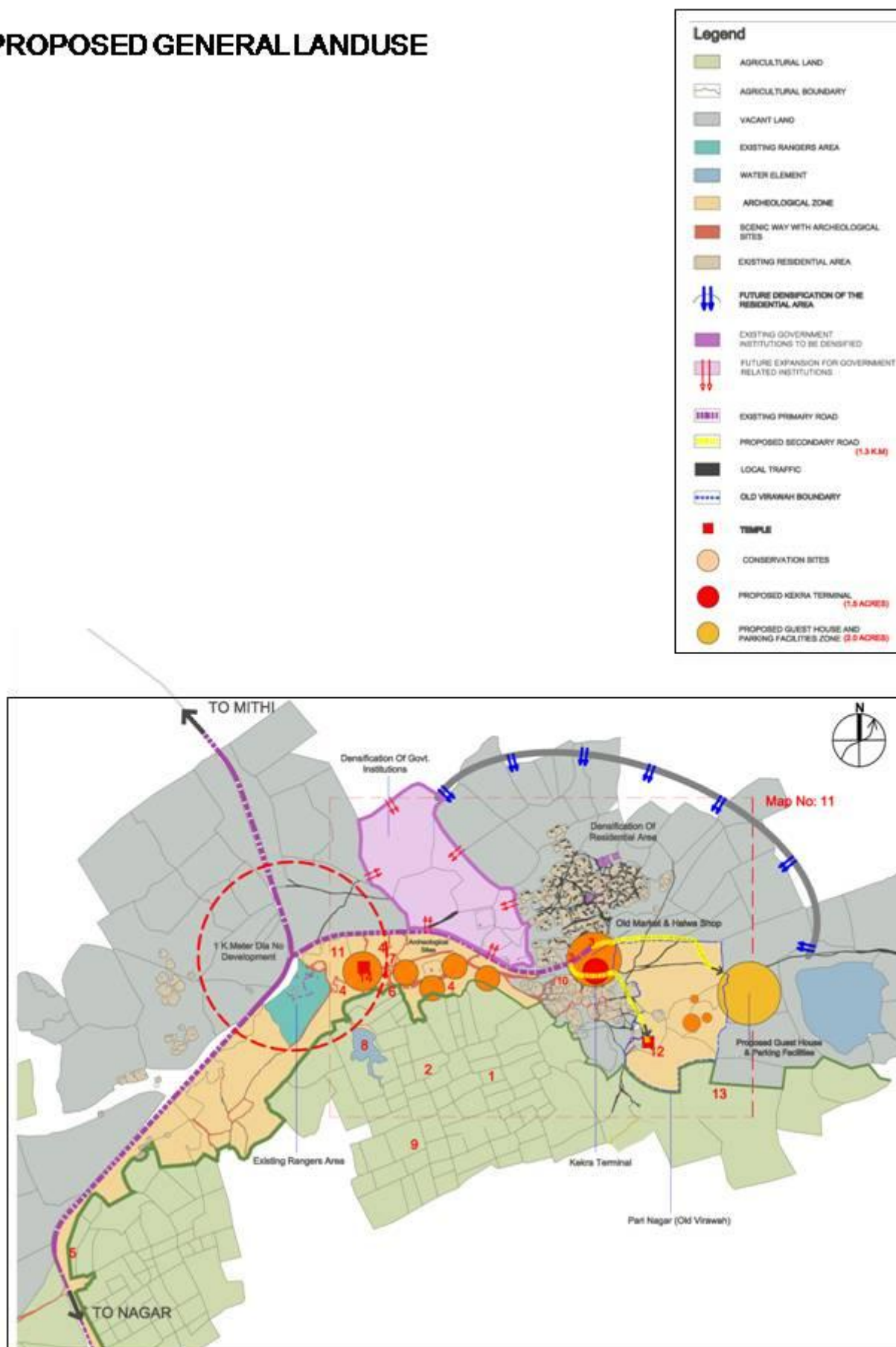


Sanga Temple

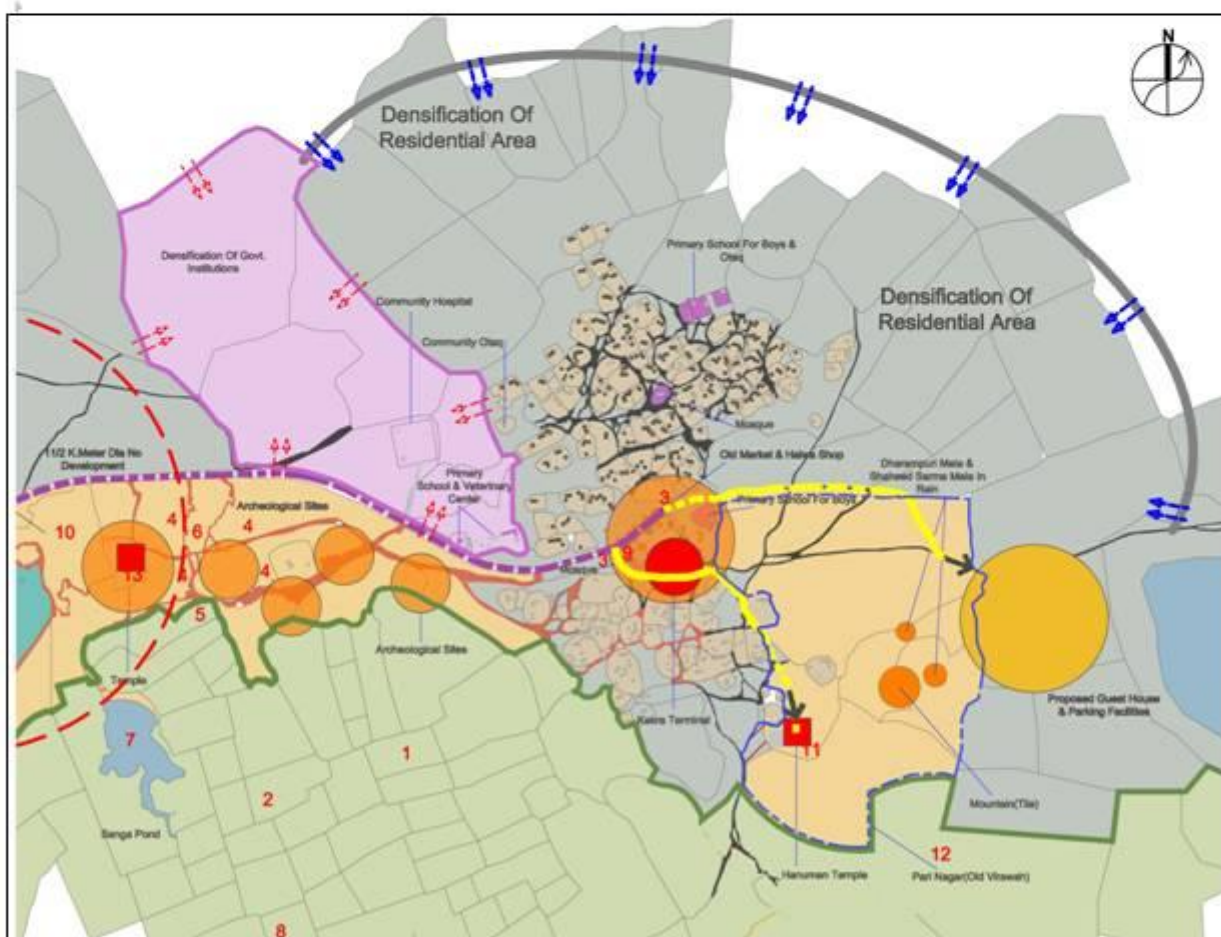
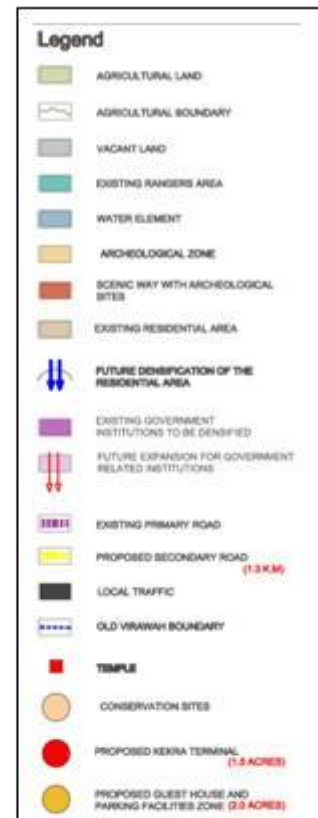


Hanuman Temple

PROPOSED GENERAL LAND USE



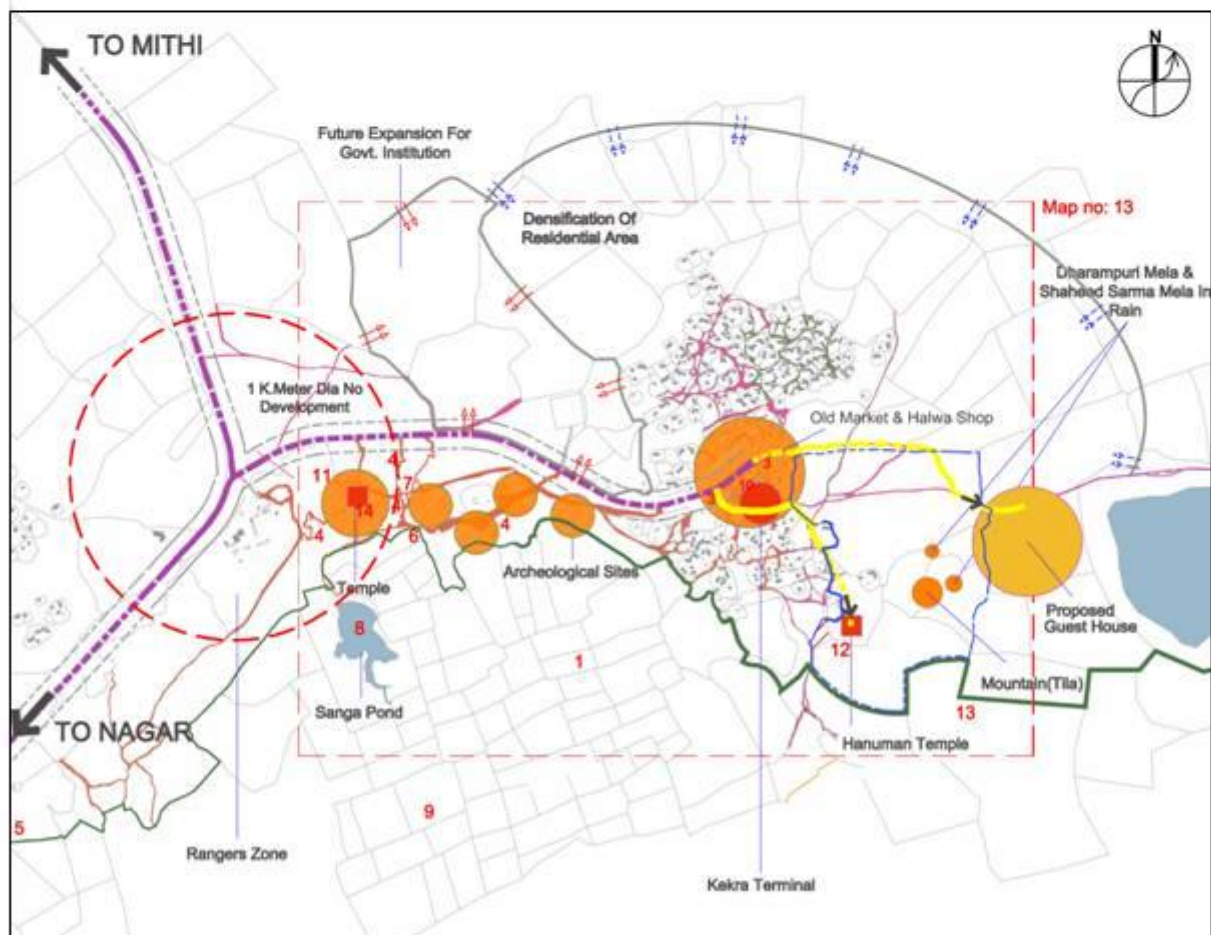
PROPOSED SPECIFIC LAND USE



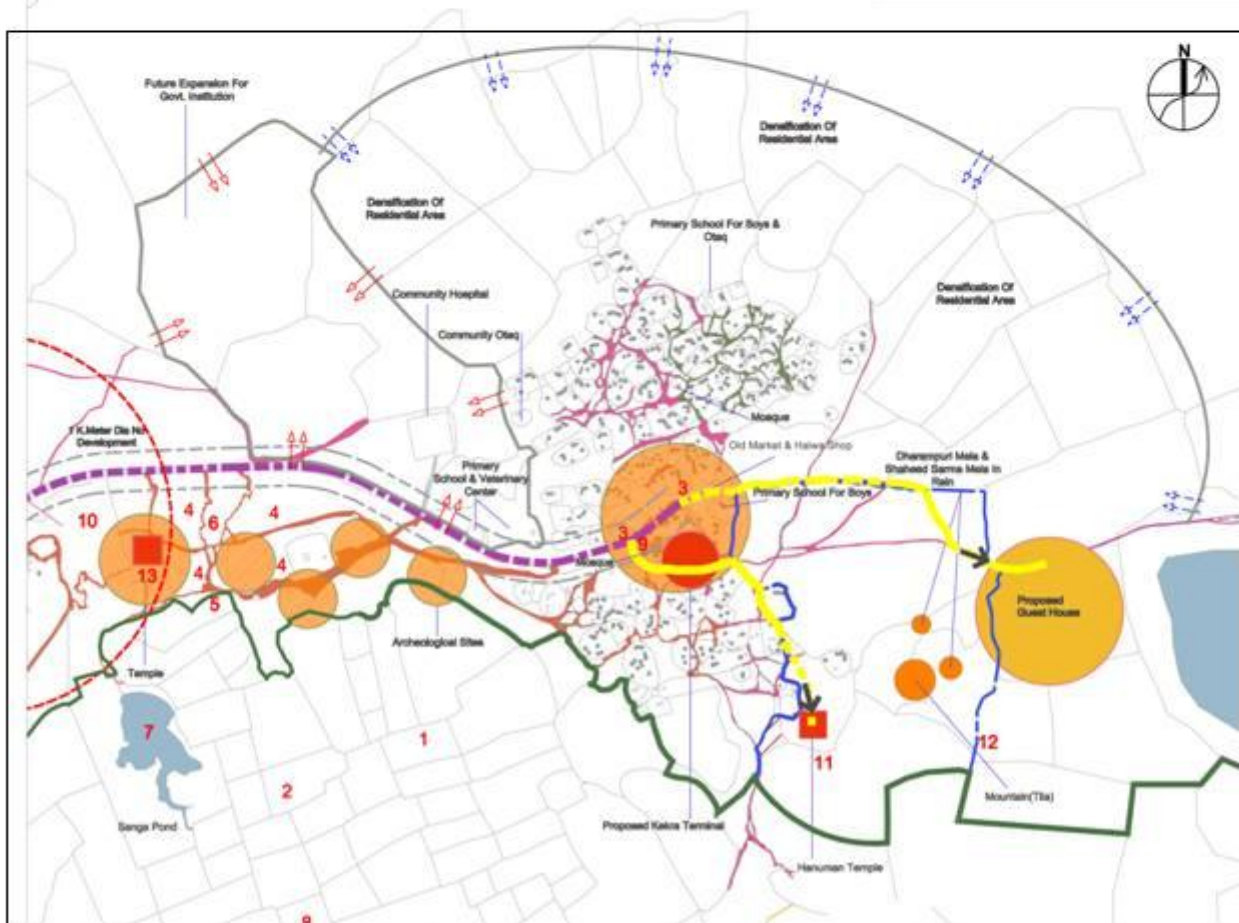
EXISTING TRAFFIC PATTERN



PROPOSED TRAFFIC PLAN



PROPOSED TRAFFIC PLAN DETAILS



2.4 BODISAR VILLAGE

2.4.1 Summary of findings

Details of the existing demographic, socio-economic, physical conditions and heritage related sites have been covered in detail in Section 6, Chapter 5 of Volume One: Existing Conditions and Future Scenarios. A summary of the more important findings is given below:

- Bodisar Village is 5 kilometres north-west of Nagarparkar Town. It is on the junction of the Nagarparkar-Mithi and the Bodisar-Badin highways.
- Because of being located on this junction, it is going to develop as an important urbanised area in the future with granite, china-clay and fisheries companies having their offices here. It will also become a major transport and cargo handling hub.
- There is already considerable pressure on the village population to sell their homes and lands and move out. Purchases of village land by both local elite and as a partnership between local elite and Karachi businessmen have taken place.
- If unplanned urbanisation takes place then the junction will become congested and environmentally degraded creating both environmental and ecological problems.
- To the south-west of the village are the foothills of the Karunjhar range and a number of historic heritage sites and buildings. These include:
 - A large pond created by containing the run off from the foothills. This is a 600 year old tank which is now being expanded by the irrigation department. The history of the tank is closely related to the history of the Taluka and has been recorded in the report for Phase One. The area around the tank is scenic and needs to be preserved.
 - Next to the tank there is a 16th century mosque which is in a bad state of maintenance. It is also being adversely affected by the rising water table due to its proximity to the tank.
 - Also adjacent to the tank is an exquisite Jain temple which has been badly damaged due to the earthquake four years back. The temple will collapse if measures to support its structure are not taken immediately.
 - At the foot of the hills to the north of the Jain temple, two small Jain temples are also located. They have been badly damaged due to water penetration from their roofs. They also need immediate attention.
 - At the foot of the hills and adjacent to the two small temples, there are substantial remains of habitation in the form of mounds containing hammer dressed stones. From their scale, they appear to be of considerable archaeological importance.
- About 1,500 people are said to have visited these monuments on the weekend of August 14, 2008. However, they did not stop at the village but just passed through it.
- The village also attracts about 2,000 Menghawars every year for the Sunat Khati Ram Mela. Khati Ram was a Bughat from the village who died in 1978.

- There are no information, residential or food and drink facilities for tourists to the heritage sites.
- The village and the heritage sites lie to the north of the Bodisar-Badin Highway and can be accessed both from this highway and from its junction with the Bodisar-Nagarparkar Highway where the village is located.
- The population of the village is of the Menghawar caste and as such both men and women are skilled artisans.

2.4.2 Recommendations

- i) A landuse plan has been prepared for Bodisar area. It proposes and/or identifies locations for the following:
 - A 1-1/2 kilometre radius around the junction of the Mithi-Nagarparkar and the Bodisar-Badin highways needs to be protected from future construction. This will save the village from destruction and provide future economic benefits to the local population.
 - The area from the foothills to the Bodisar-Badin Highway which contains the village, the monuments and the pond has to be protected from future construction so as to preserve its heritage nature and ecology. Architecture and construction in this area should be minimum and should follow the guidelines developed for the Taluka as a whole.
 - For accommodating the new commercial, business, transport, cargo and related residential and social facilities, a new village needs to be planned. The site of this village should be to the north of the Bodisar-Badin Highway and 1-1/2 kilometre from the junction of the Bodisar-Badin and the Bodisar-Mith highways.
 - It is estimated that if granite and coal mining develops, the population of the new Bodisar village will be about 25,000 by the year 2020.
- ii) Other interventions:
 - Given the fact that the village population has skills and that a new township will eventually develop, a programme for promoting these skills and marketing them for the visitors to the heritage sites and for the population that is going to work in the companies that are likely to be established.
 - Given the fact that so many tourists visit the heritage sites, residential accommodation and an information centre for them is required.

2.4.3 Projects that come out from the recommendations

i) Immediate projects:

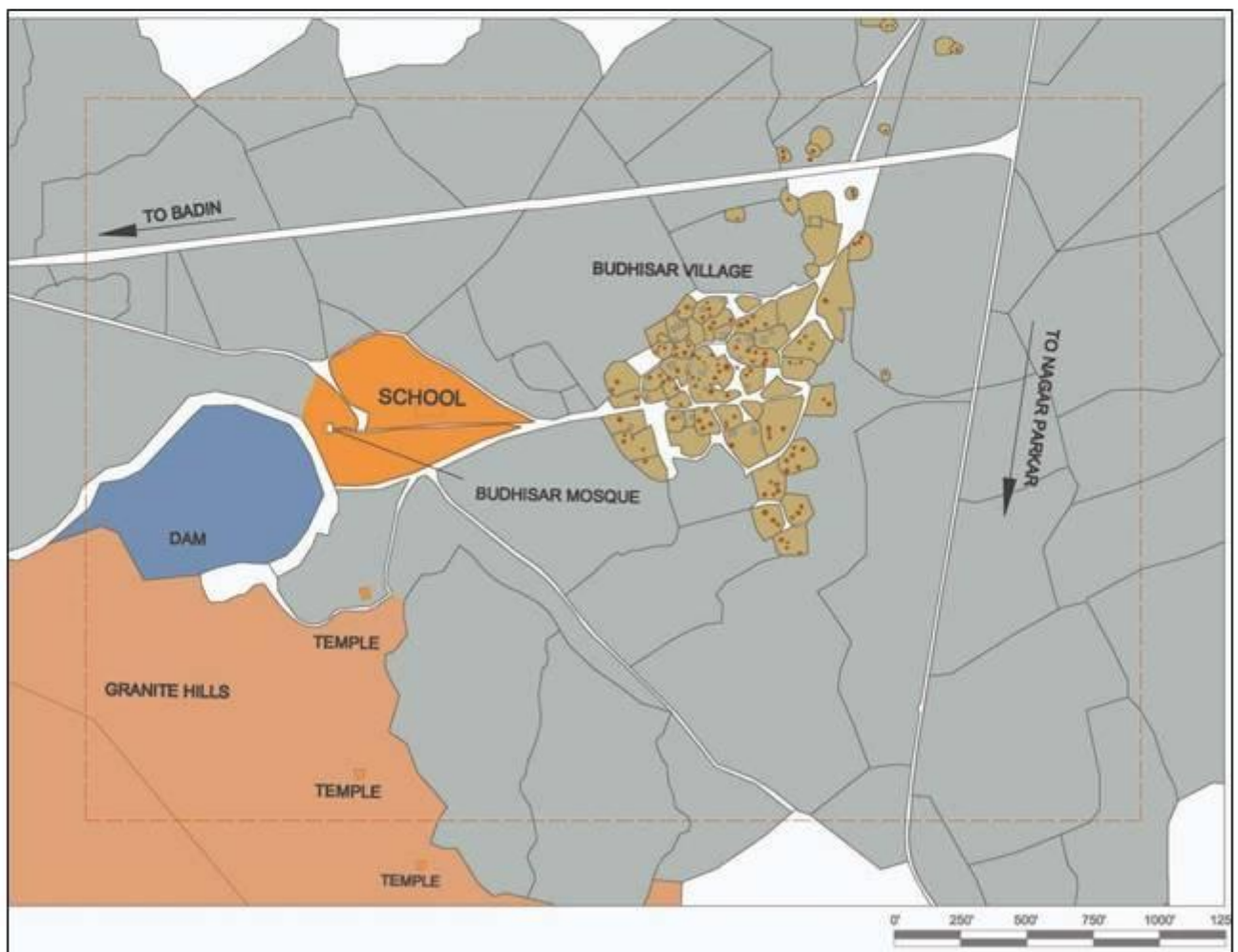
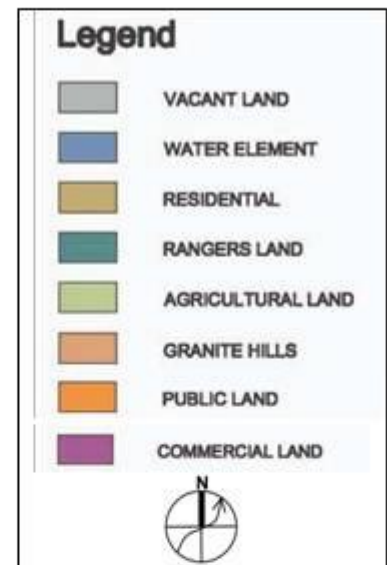
- A study for the initiation of development plans for the junction and the new Bodisar village on the basis of the recommendations in the previous section should be undertaken.
- Restoration and/or preservation of the mosque and the temples should be undertaken immediately. The tracks leading to the mosque and the temples should be clearly identified and trees should be planted on either side of them. Steps in this direction should be initiated and the relevant departments, such as the Sindh Antiquities Department, should be contacted for this purpose.
- A tourist information centre and cheap residential accommodation for tourists should be established. The Sindh Antiquities Department is already constructing a rest house in the neighbourhood.

ii) Later projects for which studies can be initiated on the basis of concepts that have been developed:

- Initiation of development plans for the junction and the new Bodisar village on the basis of the recommendations in the previous section should be undertaken and public consultation should be held to approve and/or modify them.
- A road should be planned through the village to the heritage sites so that the village can benefit from tourism. An area for the development for tourist facilities such as handicrafts shops, toilets, eating and drinking facilities has been identified along with the road alignment.
- An assessment of skills present in the village and the possibility of organising them for commercial purposes should be undertaken.
- A plan for the forestation around the pond and along the Kuranjhar hills should be initiated through the relevant department

2.4.4 Maps and photographs: Bodisar Proposal

BUDHISAR EXISTING LANDUSE



BUDHISAR



Camel Riding



Dam



POND



Under Construction SPILLWAY



Stone Pitching for Spillway



Budhisar Mosque

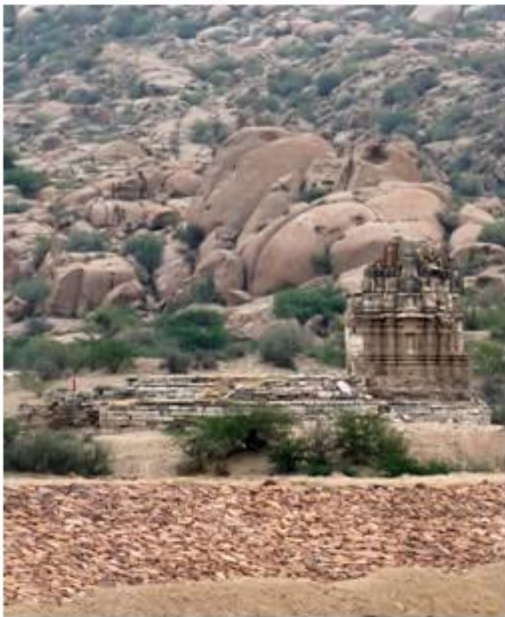
BUDHISAR



Old Grave With Mosque



Small Temple-1



Main Jain Temple

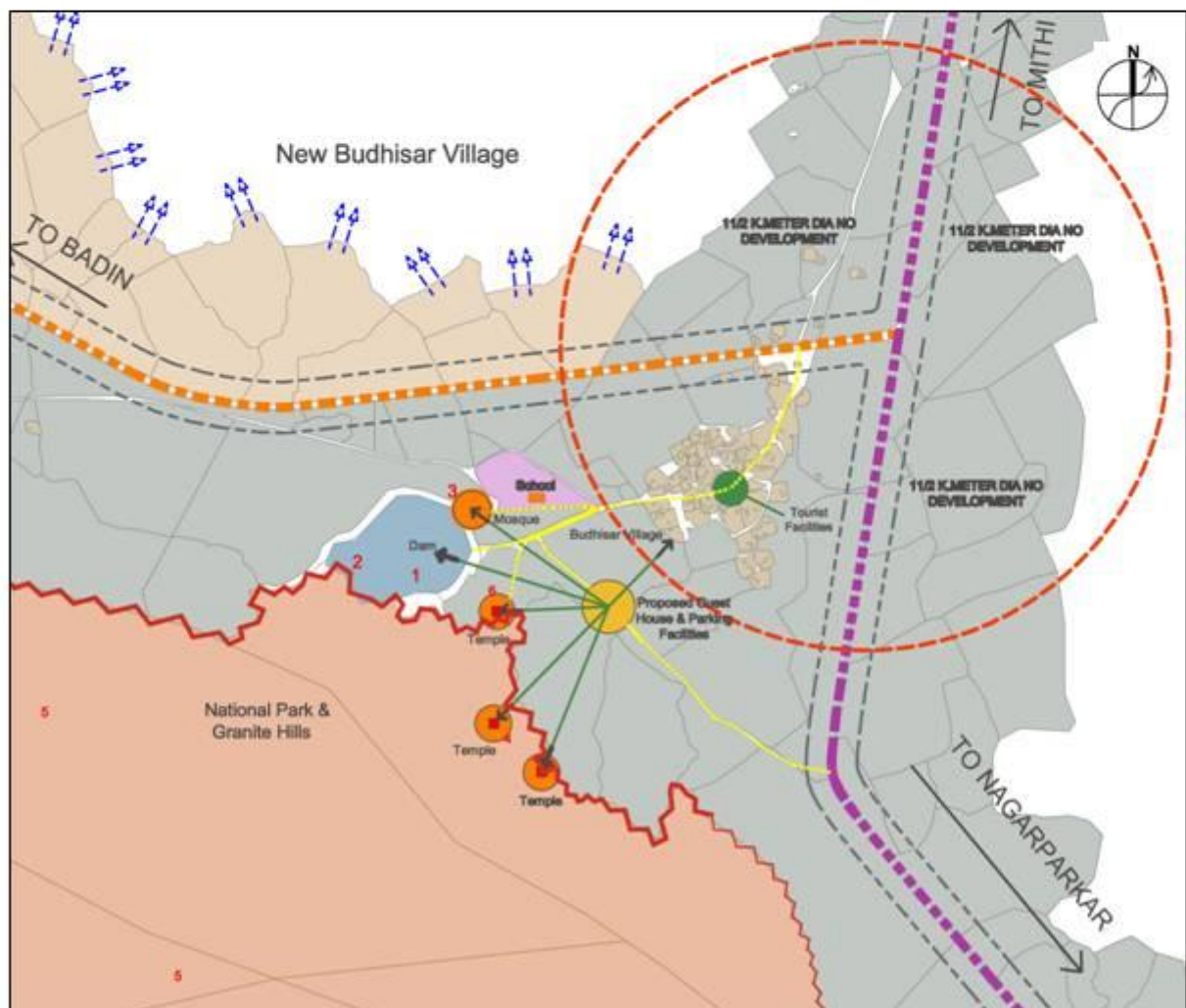


Main Jain Temple



School

PROPOSED GENERAL LANDUSE



2.5 KASBO VILLAGE

2.5.1 Summary of findings

Details of the existing demographic, socio-economic, physical conditions and heritage related sites have been covered in detail in Section 4, Chapter 5 of Volume One: Existing Conditions and Future Scenarios. A summary of the more important findings is given below:

- The population of Kasbo Village today is 4,200. On the basis of the existing growth rate it will be 5,200 in 2020. 98 per cent of this population is Hindu.
- Natural increase in the population can be accommodated easily through densification. However, space for migrants and the services sector to tourism and transport will have to be accommodated.
- The school age going population is about 2,000 and will be 3,000 in 2020. The present facilities do not cater to the present school going population. Space for the expansion of schools and related facilities is required. Children from neighbouring villages also attend classes at the village schools and go for higher education to Mithi. 08 acres of land will be required by 2020 for education related infrastructure.
- Apart from one government dispensary the village has no health facility and the dispensary has no doctor.
- There is a government piped water scheme in the village. However, the supply from the scheme is unreliable and so people get water from dug wells and tube wells.
- There are no sanitation facilities, electricity or solid waste management systems in place in the village.
- Kasbo is rich in economic terms. Its economy is almost entirely dependent on agriculture and livestock. 100 to 150 kekras come and leave the village yearly and the produce and livestock are sold increasingly to the Karachi market.
- Agricultural produce is stored on vacant government land from where it is picked up by the kekras and by trucks. There are no proper pick up points or cargo handling spaces.
- There are 20 to 30 grocery and clothes/textile shops in the village and they provide supplies on credit to the village communities.
- The village has a large population of Menghawars. Both men and women have artisanal skills and know how to make, shawls, blankets, *gilm*, and embroidery. However, due to an absence of a market, most of them shifted to Naukot.
- The village kumhars manufacture roof tiles that are used extensively for vernacular architecture throughout the region. Carpenters in the village also manufacture beautifully carved doors and donkey and bullock carts.
- The village can be divided into two. The northern part of the village is dense and is completely dominated by the Manghawar community. It already has urban characteristics and contains schools, temples, and retail shops. The southern part of the village is spread out and gives the feel of a deserted rural area.

- One enters the village from Nagarparkar from the north and transport moves through the northern part of the village and terminates at the end of the southern part. This transport movement defines the main artery of the village.
- Transport and produce pick-up points can be logically located at the southern end of the village. This will benefit the marginalised southern part in physical and socio-economic terms.
- The open spaces along the artery are extremely attractive and in the northern part of the village there are beautiful narrow walkways that open out onto small spaces where shops and community gathering spaces have developed.
- These walkways lead to two important temples of Shri Ramapir and Shiv Mandir. These temples are of considerable historical importance and about 200 persons per day visit them during the monsoon season. About 20 per cent of the visitors are families. They do not stay the night as there is no accommodation for them.
- The village communities have no objection to the developing of residential accommodation for them on the periphery of the village but not in the village itself. They have no problems with tourists walking through the village, observing village life, and eating and drinking at spots on the way.
- A festival (between August and October) is held every year at Shri Ramapir Temple. About 3,000 people come for this festival and stay the night in the festival grounds. Many of them stay with their relatives in Kasbo. People come from Nagarparkar and set up shops and stalls for the festival and food is served to the pilgrims.
- About 4,000 people come for the Shiv-Ratt in February at the Shiv Mandir and spend the night at the Mandir site.
- The number of persons visiting the mandirs and the festivals and rituals around them are increasing and need to be better organised. Space and construction for accommodating the pilgrims and toilet facilities for them also need to be developed.
- In the fields near the temples, the TRDP has developed solar operated tube wells. These are already a major tourist attraction and have the potential of being developed further as an attraction through publicity.
- The road from Nagarparkar to Kasbo is being built. After that the number of visitors to Kasbo will increase and so will trade, commerce, livestock and agricultural activity. The Kasbo communities feel that the tourist and pilgrim related economy can be promoted and provide benefits to them.
- With the building of the road transport into Kasbo will increase and as such the main artery that links northern and southern Kasbo will become environmentally degraded and congested, destroying the present ambience of the village. Therefore, alternative routes bypassing the village need to be developed.

2.5.2 Recommendations

- i) A landuse plan (2010-2020) has been developed for Kasbo Village. It proposes and/or identifies locations of:
 - Bypass to the village leading to a product pick up point and bus terminal in the south of the village and another terminal to the north-west of the village.
 - Location of guest houses and tourist accommodation to the north-west of the village.
 - Spaces for the development of tourist related reception, rest areas and shops along with spaces for horse and/or camel stands which tourists can use for riding purposes.
 - Paving of the main artery along with the identification of picturesque lanes and spaces for development and paving.
 - Protection of important vernacular architecture and spaces for densification of residential accommodation.
 - Identification and restoration/preservation of heritage sites and areas.
 - Identification of horse and/or camel ride paths from the village to the temples and solar tube wells.
- ii) Other interventions:
 - Identification of locations for social sector infrastructure projects and their scale.
 - Initiation of a study for developing and marketing for tourists of artisanal products produced by the local community.
 - Initiation of community managed tourism services including the training of guides and staff for the management of tourist rest houses and residential accommodation.
 - Studies for the development and implementation of sustainable water supply, sanitation, solid waste and solar energy programmes. The concepts for these have been developed.

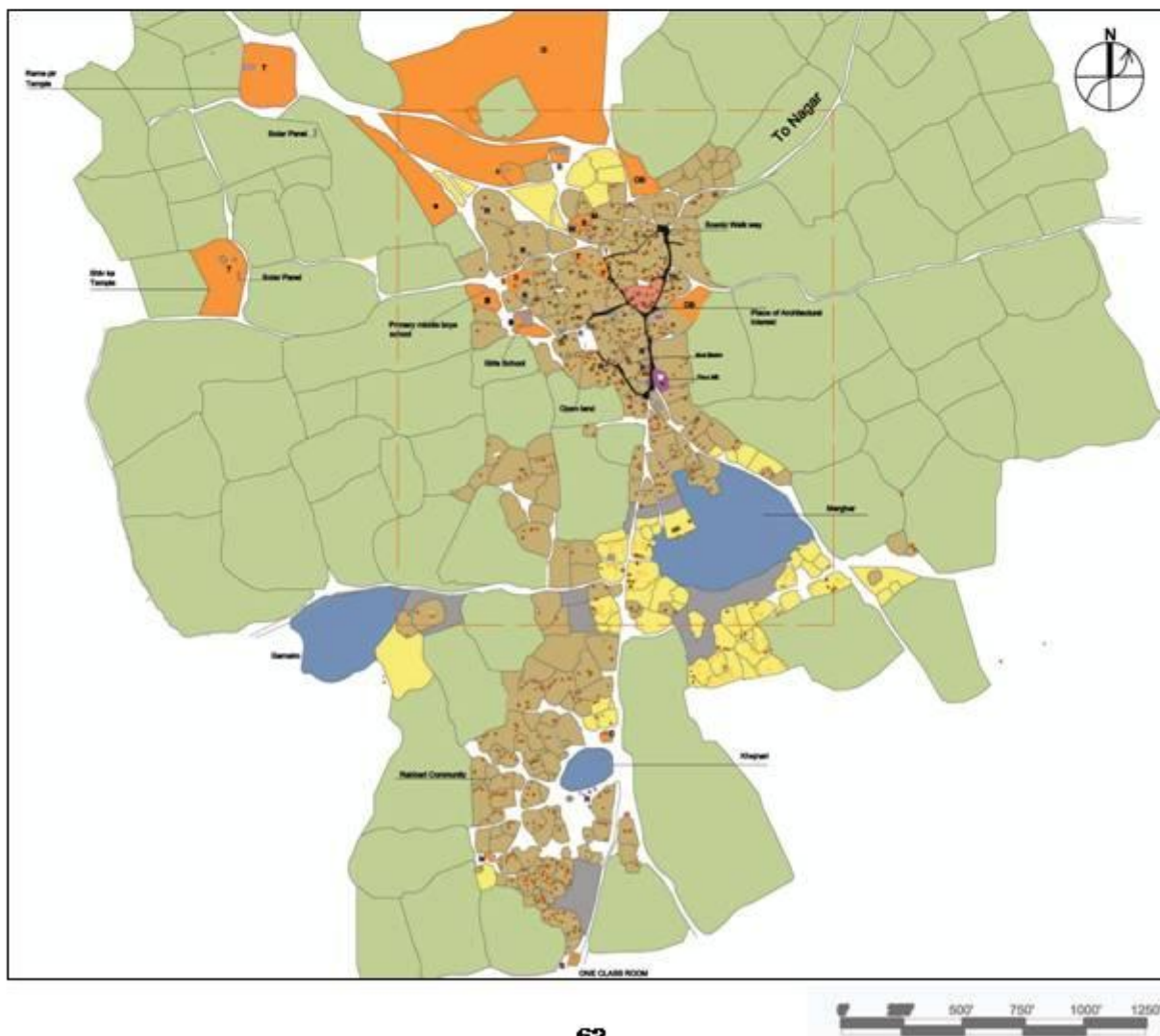
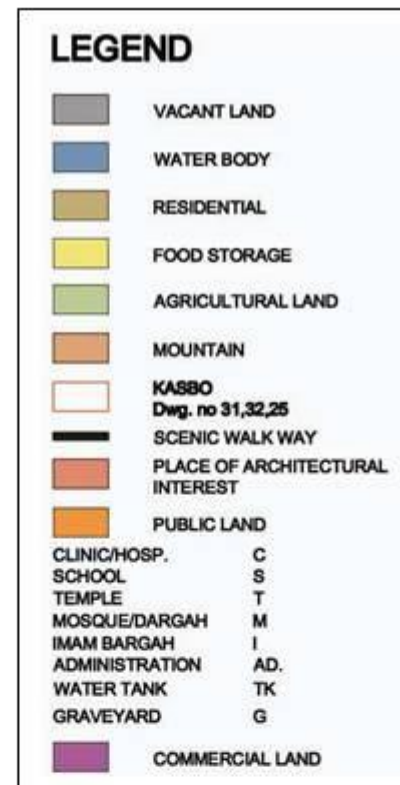
2.5.3 Projects that come out from the recommendations

- i) **Immediate projects:**
 - Support to the TRDP's community managed tourism development plan consisting of developing:
 - Reception and briefing centre for tourists
 - Paving of walkways through which tourists will walk and view the social and physical aspects of the village and access the temples
 - Points from where tourists can hire camels/horses to go to the temples and solar sites

- Community managed water, sanitation and solid waste management programmes
 - Building tourist residential facilities at allocated sites
 - Initiating a programme for the training of community members for the management of tourist related functions such as guides, managers, waiters etc.
 - Development of a governance programme within TRDP, community organisations in Kasbo and government agencies to make the TRDP proposal possible.
- ii) **Later projects for which studies can be initiated on the basis of the concepts that have been developed:**
- Initiation of studies for the building of the bypass, product pick-up points and bus terminals that have been recommended.
 - Identification of land that needs to be acquired for the above functions.

2.5.4 Maps and photographs of Kasbo

KASBO EXISTING LANDUSE



KASBO



Agricultural Land



Agricultural Land



School



Dargah



KASBO



Scenic walkways



Scenic walkways



Shiv ka Temple



Temple

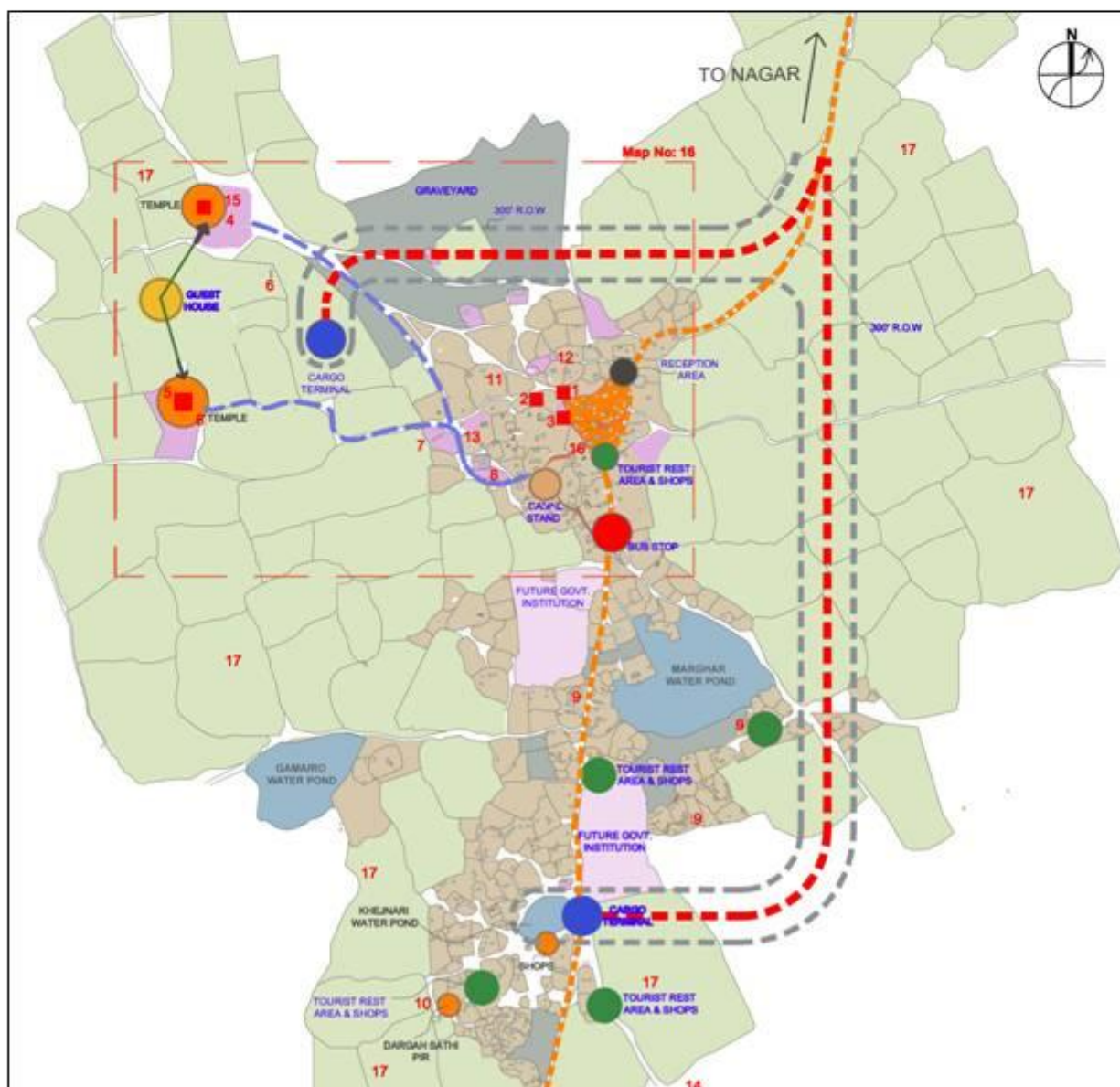


Solar Panel

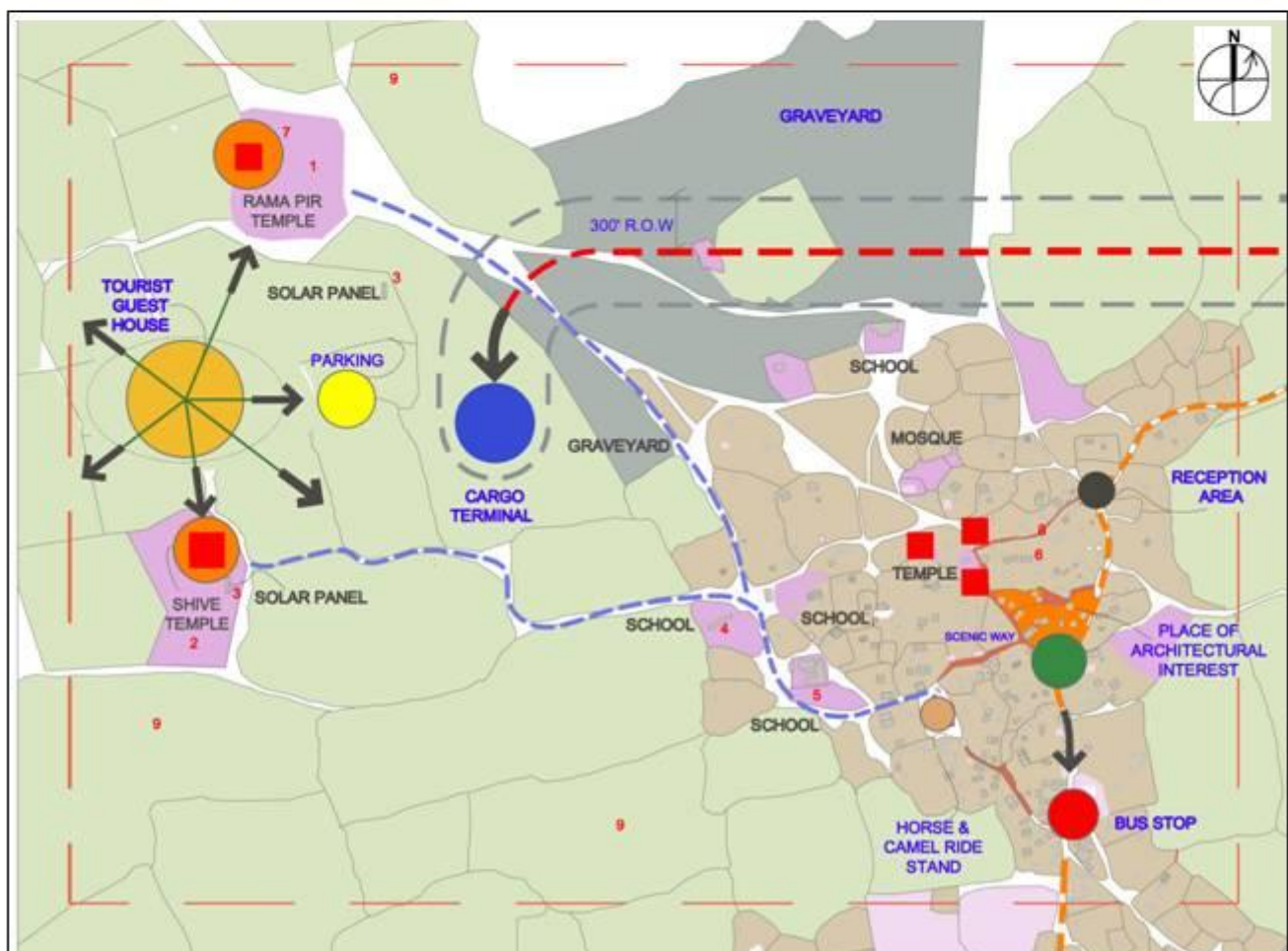


Rama Pir Temple

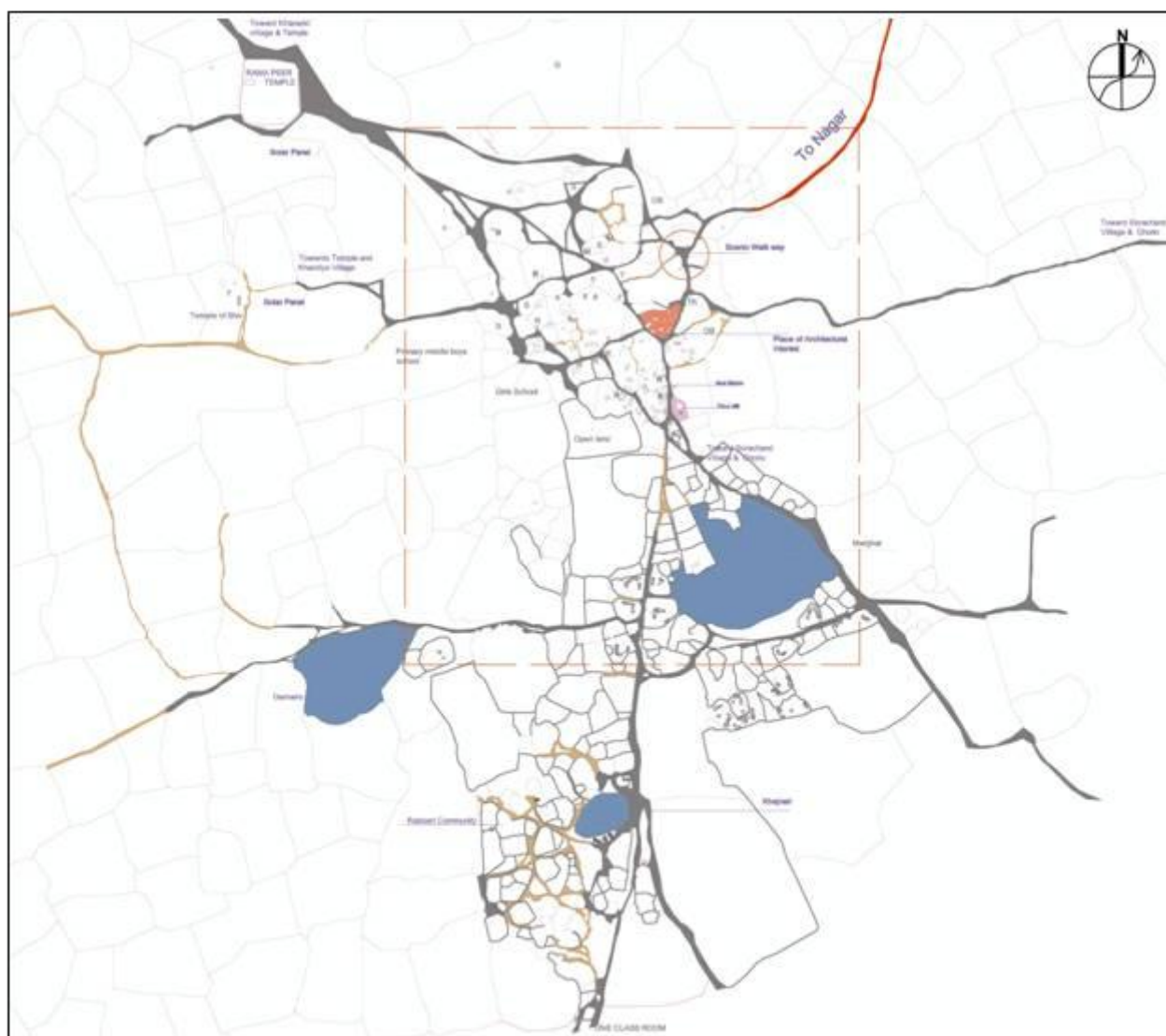
PROPOSED GENERAL LANDUSE



PROPOSED SPECIFIC LAND USE



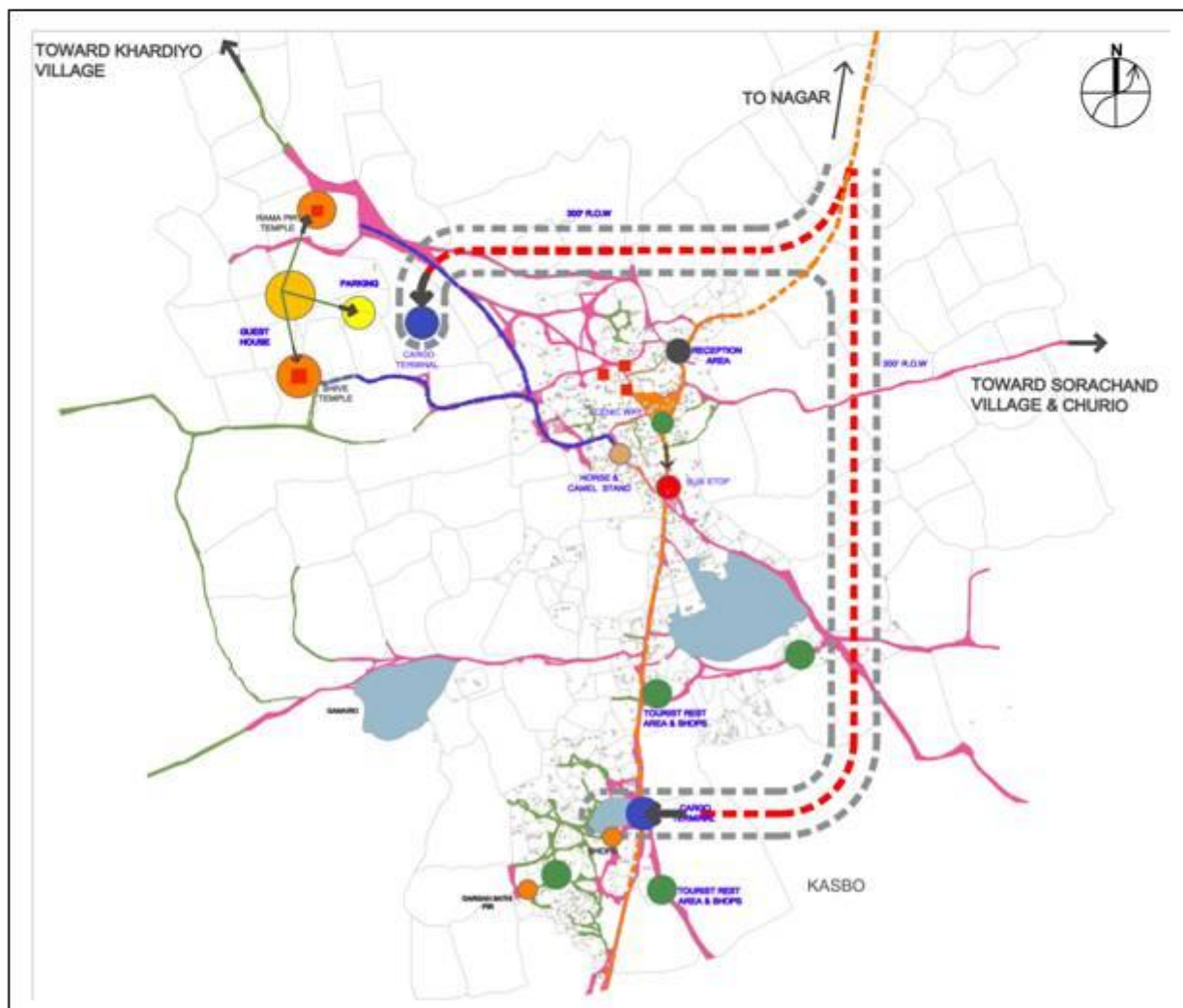
EXISTING TRAFFIC PATTERN



PROPOSED TRAFFIC PLAN

Legend

-  PROPOSED BYPASS (2.7 K.M)
-  PROPOSED PRIMARY ROAD (1.85 K.M)
-  SECONDARY ROAD
-  TERTIARY ROAD
-  300' R.O.W (5.4 K.M)
-  PROPOSED HORSE OR CAMEL RIDE (1.25 K.M) TO TEMPLES
-  SCENIC WALK WAY
-  WATER ELEMENT
-  TEMPLE
-  PROPOSED HORSE OR CAMEL RIDE STAND (0.25 ACRES)
-  PROPOSED RECEPTEION AREA FOR TOURIST (0.25 ACRES)
-  PROPOSED TOURIST REST AREA AND SHOPS (0.25 ACRES)
-  PROPOSED CARGO TERMINAL (1.5 ACRES)
-  CONSERVATION SITES
-  PROPOSED PARKING FACILITY FOR TOURIST (1.0 ACRES)
-  PROPOSED BUS STOP (0.25 ACRES)
-  PROPOSED AREA FOR TOURIST GUEST HOUSE (2.0 ACRES)



2.6 GHORI VILLAGE

2.6.1 Summary of findings

Details of the existing demographic, socio-economic, physical conditions and heritage related sites have been covered in detail in Section 7, Chapter 5 of Volume One: Existing Conditions and Future Scenarios. A summary of the more important findings is given below:

- The village has a population of 2,000 (300 households). The village residential area can be densified to accommodate natural growth till 2020. It is unlikely that there will be any migration related growth in the village.
- The village needs schools desperately. About 25 per cent of the school age going children go to school.
- The Nazim has provided a tube well which taps the aquifer at 300 feet. The water is brackish and the system functions erratically.
- There is a presence of TRDP in the village. They have provided 22 hand pumps and are promoting a pit latrine sanitation programme.
- The village has a large livestock population of 4 to 5 thousand and about 1,500 (including camels) per year are sold for the Karachi, other Sindh cities and the Balochistan markets.
- The village is socially and economically upwardly mobile with about 25 persons working in garment factories in Karachi and an additional 22 in government jobs.
- 1-1/2 kilometres east of Ghorī and about 3 kilometres from the main Mithi-Nagarparkar Highway is the famous 14th century Jain temple, known as the Ghorī Temple. Legends associated with it have been recorded in Volume 1 of the Report.
- Thousands of tourists visit the temple every year. During and after the rains, 50 to 60 cars and/or motorcycles visit the temple every day but they do not stop at the village since there is no attraction over there for them. People who attend the Sadhro Mela invariably visit the temple in transit. Their number “is in thousands”.
- There are five Devi mandirs in the village. Some visitors visit them as well.

2.6.2 Recommendations for projects

i) Immediate projects:

- A documentation and preservation plan for the Ghorī Temple and the area around it.
- Planting trees along the road from Ghorī village to the temple.
- Creation of a tourist reception centre on the other side of the road from the Temple and at a distance of 200 metres from it. The reception centre should have a tea shop, a shed for housing horses and camels so that tourists could come from the village to the temple on camel or horse back. The architecture of the reception centre should not adversely affect the natural environment around the monument or impinge on its historic importance.

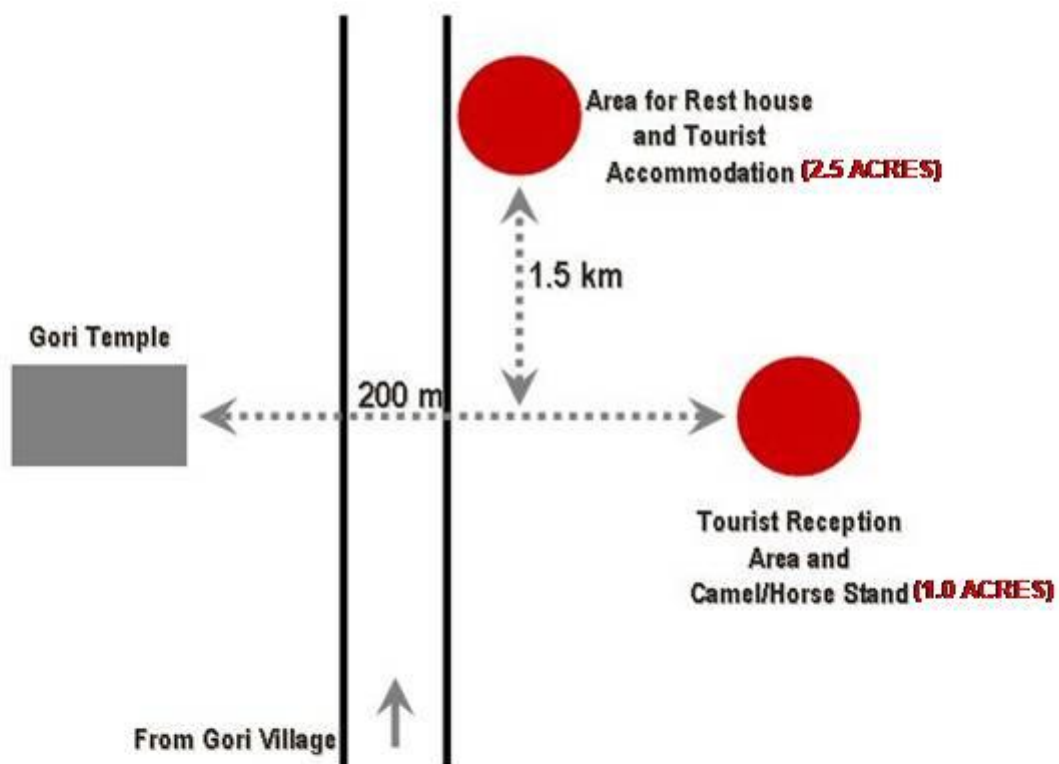
- Creating a car park at 100 metres from the temple complex and surrounding it with trees.
- Creating the institutional arrangements for making the above possible.

ii) Later projects for which studies can be initiated:

- Building of a rest house and residential accommodation for tourists. This should be located about one kilometre beyond the temple to the east. A site on government land had been identified for it.
- The development of a landuse plan for the village.

2.6.3 Plan of Ghorī Village access road to the temple and location of proposed facilities

GHORI: TEMPLE SITE PROPOSAL



GORI VILLAGE

GHORI TEMPLE



2.7 CHURIO VILLAGE

2.7.1 Summary of findings

Details of the existing demographic, socio-economic, physical conditions and heritage related sites have been covered in detail in Section 7, Chapter 5 of Volume One: Existing Conditions and Future Scenarios. A summary of the more important findings is given below:

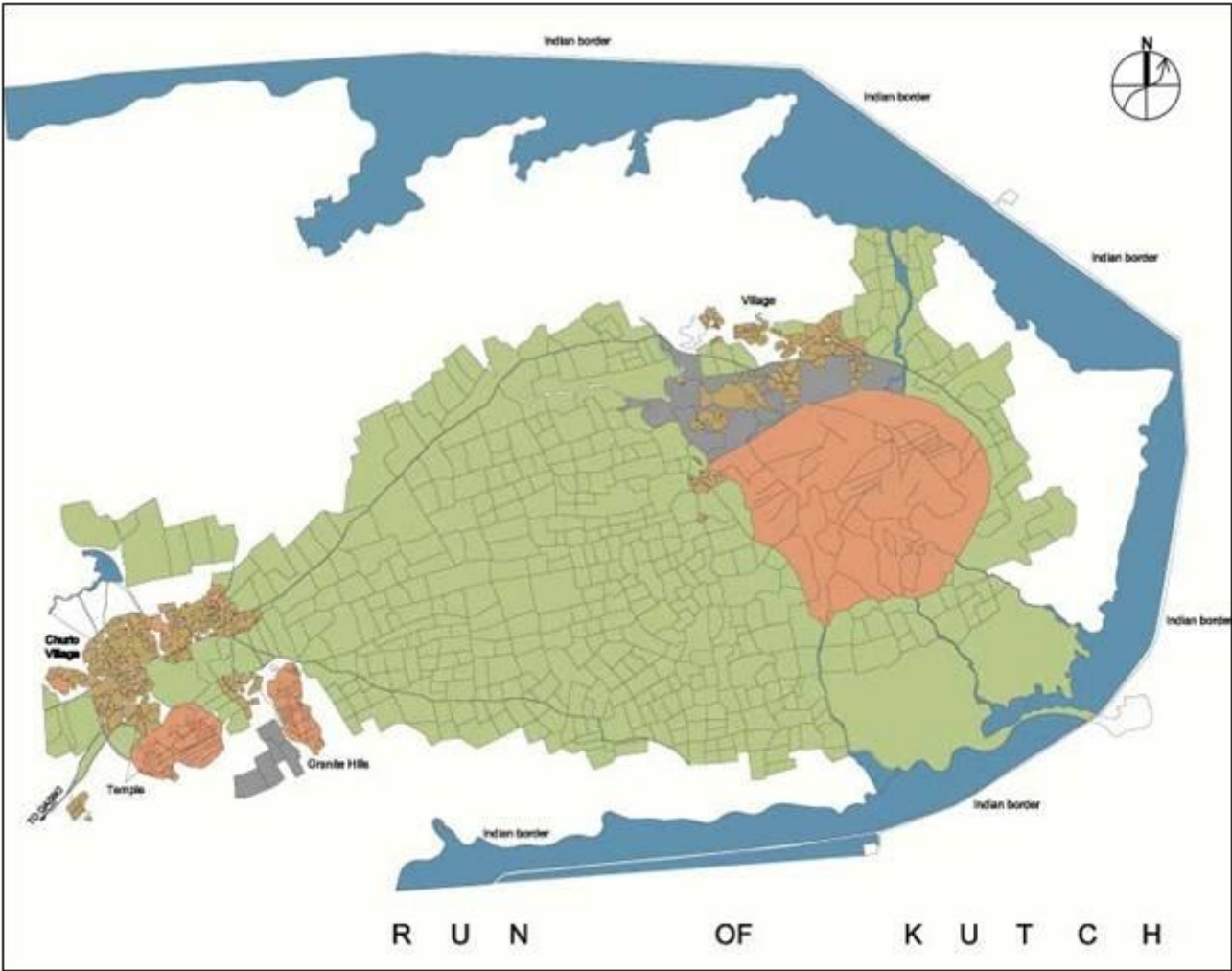
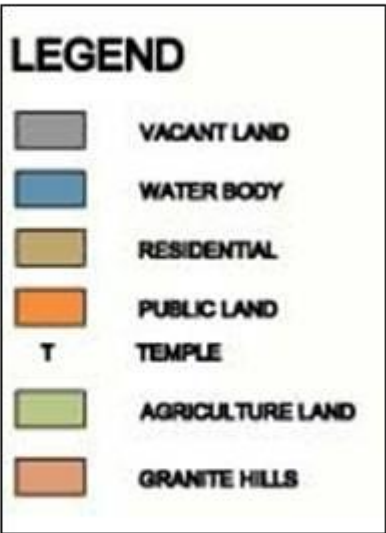
- Churio village is located 22 kilometres east of Nagarparkar Town on a protrusion that juts out as a peninsular into India.
- Given the location and distance from Nagarparkar, it is unlikely that its population of about 2,500 will increase by more than 20 per cent by 2020. This increase can easily be accommodated through densification in the paras of different communities.
- Churio has a big tourist potential. It has granite protrusions to the south and east of it which are very dramatic. These overlook the Indian border to the north, south and east. A beautiful view of the Runn of Kutch is also available.
- The Indians light up their side of the border at night. The movement of vehicles and settlements is easily available.
- There are two important mandirs in the village. One is the Shiv Mandir and the other is dedicated to Sammat Devi and commands a beautiful view of the Indian border and Runn of Kutch.
- Both these temples, if facilities are available, would attract tourists from all over Sindh because of the views they offer.

2.7.2 Recommendations and projects

- Tourism could be built around providing view points on the hills for looking into neighbouring India. Binoculars and telescopes could be made available for this purpose along with eating, drinking and relaxing facilities. The architecture of these view points could merge into the natural environment so as to be unobtrusive.
- A rest house would also be very popular in Churio, especially if it is built on the granite hill east of the village.
- A documentation and preservation programme for the two temples needs to be initiated along with a landuse plan.
- A study for the development and implementation of the above proposals is required along with addressing the security issues for which an understanding with the Rangers is necessary.

2.7.3 Maps and photographs

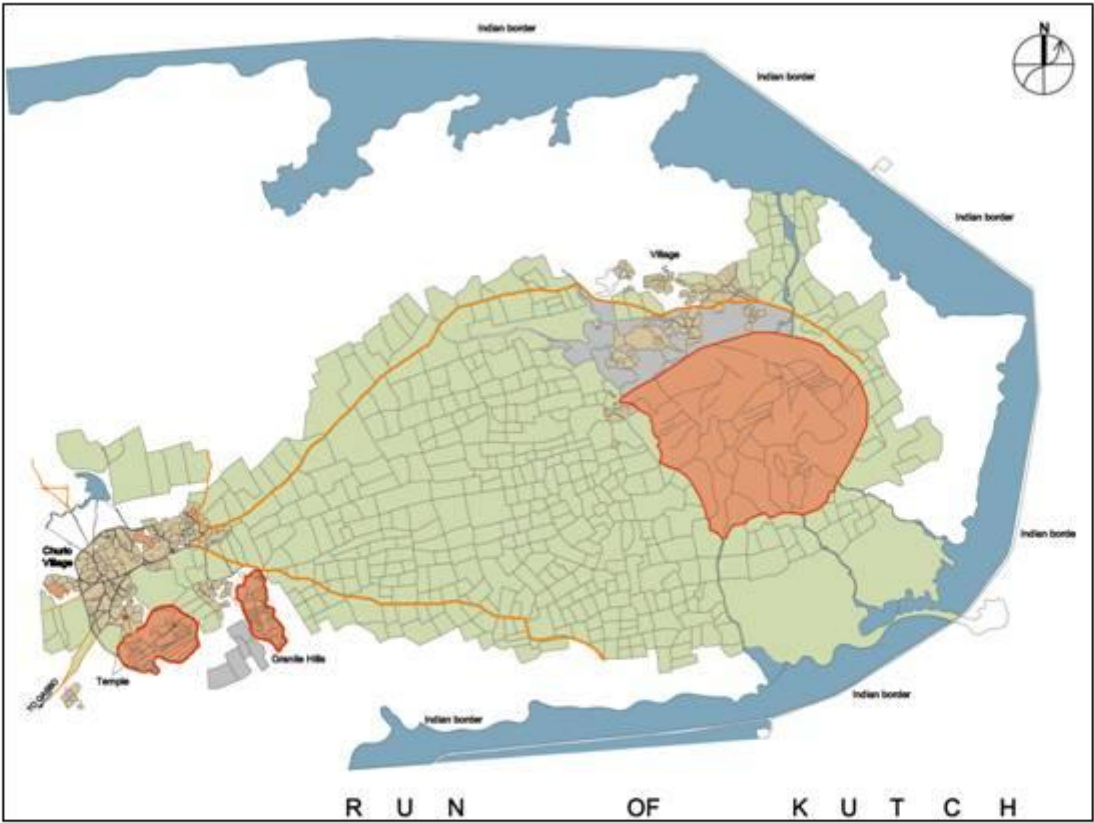
CHURIO EXISTING LANDUSE



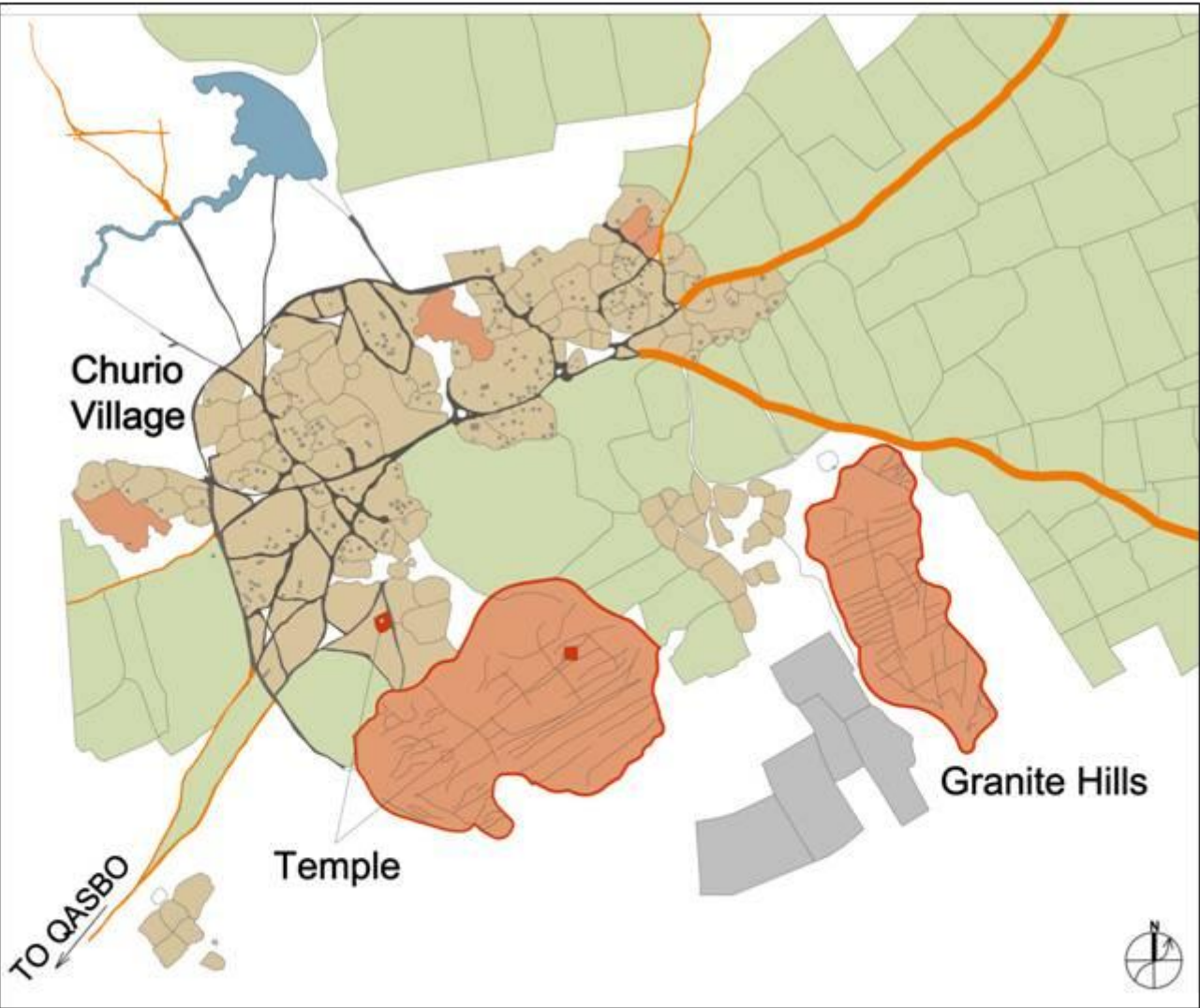
CHURIO



PROPOSED GENERAL LAND USE



PROPOSED SPECIFIC LANDUSE



3. TRDP AND GOVERNMENT INSTITUTIONAL ARRANGEMENTS FOR PROJECT IMPLEMENTATION

3.1 INSTITUTIONAL ISSUES

For the implementation of the proposals in this report, institutions and institutional arrangements will have to be created and the relevant stakeholders will have to be consulted and involved in the design, implementation, management and maintenance of the identified projects and programmes. For this it is suggested that TRDP arranges a series of workshops in which presentations of this report can be made. On feedback from these workshops, modifications to the project proposals and landuse plans can be made and an agreement on institutional arrangements can be arrived at. However, some suggestions regarding institutional arrangements are given below.

3.2 THARDEEP RURAL DEVELOPMENT PROGRAMME

For the implementation of the recommendations and projects identified in this report, the TRDP will have to set up two interrelated institutions whose details are given below:

- i) **Physical Planning Design and Advisory Cell** whose functions will be to:
- Provide design and supervision guidance to individuals and institutions wishing to carry out architectural and/or engineering works in the Taluka
 - Provide landuse planning advice to government agencies, NGOs and community organisations on the basis of the recommendations contained in this proposal and on the advice of consultants that may be appointed by the TRDP for this purpose
 - Establish, with community and government support, town/village management committees who will determine, with the support of the Cell, the development priorities and projects for their settlements
 - Carry out research, documentation and monitoring into ecological, environmental, socio-economic and technical issues and on that basis propose development plans and modifications and/or support to government projects

To begin with the Cell may consist of an architect/planner, an engineer, a quantity surveyor and two draftsmen and may be supported by consultants as and when necessary. Later on a social researcher and support staff can be added.

- ii) The TRDP may also establish a **Tourism Development Unit**. The function of the Unit will be to:
- Develop a tourist promotion plan for the Taluka
 - Set up tourist information centres under the plan
 - Promote the festivals, historic sites, folklore and the flora and fauna of the Taluka in the media and through handouts and publications
 - Identify locations where tourist related infrastructure can be built

- Arrange for the development of tourist related human resources through the establishment of training programmes for local communities
- Involve local communities as partners in the process

The staff required for the Unit will be determined after a feasibility for its establishment and its scope of work has been finalised through a consultative process.

3.3 GOVERNMENT INSTITUTIONAL SUPPORT

To promote the recommendations of this report, the government may set up two interrelated institutions whose functions are given below.

i) **Nagarparkar Tourism and Culture Department** that may:

- Develop and promote tourist related information and facilities through a partnership with communities and NGOs
- Support the development of human resources for the promotion, management and operation of tourist related economic activity
- Work in collaboration with the provincial Department of Culture to promote the culture and folklore of the Taluka by supporting the organisation of culture related events and the existing festivals and religious functions
- The Department's head office will be at Nagarparkar and it will have a presence in Virawah, Bodisar, Kasbo and Churio

ii) The provincial government may also consider setting up of a **Nagarparkar Physical Planning Agency** which will:

- Support the provincial and local government agency in identifying, planning, implementing, supervising and monitoring development projects based on the concepts developed in this proposal
- Identify land for development purposes
- Work closely with TRDP, NGOs and other government departments

APPENDICES

PRINCIPLES FOR ARCHITECTURAL DESIGN

- Buildings should be earthquake resistant and of not more than two storeys. Rules of thumb have been developed for this.
- Exterior walls should be cavity walls so as to provide protection from heat.
- Roofs and exterior finishes should be in accordance with the vernacular architecture of Tharparkar. This means lime plaster external finishes, timber roofing elements supporting locally made clay tiles and surfaces painted with figures by local artists.
- The use of local materials and crafts should be promoted for roof insulation and surface decoration.
- Architecture at scenic spots should be low key and should merge/lose itself with the environment.
- The above is being done by Hasan & Polak for the TRDP's Nagarparkar Guest House Complex. This can become a model for future architecture.
- A design that overcomes the shortcoming for the Chura is also being developed along with thumb rules for seismic resistant design considerations.

Photographs

PHOTOGRAPHS OF VERNACULAR ARCHITECTURE



PHOTOGRAPHS OF VERNACULAR ARCHITECTURE



HASAN & POLAK'S MODEL FOR THE NAGARPARKAR COTTAGES



CONCEPTS FOR SANITATION

- Underground trunks should be laid in a decentralised manner to different disposal points rather to a central one. This will:
 - Reduce the gradients
 - Lower costs
 - Make O&M easier
- Trunks should be laid in a manner that different paras and/or lanes can connect to them on a self-help or decentralised basis.
- For disposals the EMI technology should be used for economic and O&M reasons.
- For the development and implementation of the above, the support of the Orangi Pilot Project-Research & Training Institute (OPP-RTI) should be sought for technical advice, managerial guidance and training of staff.

Photographs: Sanitation Conditions

NAGARPARKAR SANITATION & SOLID WASTE



KASBO: SANITATION & SOLID WASTE



VIRAWAH: WATER SUPPLY & SOLID WASTE



CONCEPTS FOR SOLID WASTE MANAGEMENT

- Depending on the size and social complexion of the settlement, a decision should be taken as to whether the collection and disposal system will be centralised or decentralised.
- Identify persons who are willing to work as sanitary workers in a para or in a village as a whole.
- Form a cooperative of these workers and provide the cooperative with tools, wheel barrows and/or tricycles for cartage.
- Get each house to pay Rs 10 to 20 per month to the cooperative for the lifting of garbage and cleaning of streets.
- For small villages the cooperative will dump the garbage at a dumping site at least one kilometre away from habitation.
- For large settlements, the cooperative will dispose the garbage at given points from where local government will pick it up and take it to a dumping site.
- For large settlements, a centralised dumping site should be avoided so as to reduce distances and costs.
- For villages of up to 2,500 population, brickwork incinerators should be provided at the dumping site. For settlements of up to 5,000 population, two to three incinerators at different locations should be developed. For populations of 5,000 and above, a proper landfill site (or sites) should be developed.
- With the development of tourism a lot of inorganic solid waste will be generated. This solid waste should be the property of the cooperatives and the possibility of its recycling locally or its sale to the Hyderabad recycling industry should be promoted.
- Litter boxes should be provided at all tourist sites and arrangement made for the collection and disposal of litter. Methods of financing this activity through some form of tourist tax could be considered.
- Sanitary workers cooperatives exist in many neighbourhoods in Pakistan's urban areas. One of the most successful examples is in Hazara Colony (Union Council No. 3) Rawalpindi where over 1,000 households pay the cooperative Rs 40 per month. The cooperative was initiated by the Akhtar Hameed Khan Memorial Trust, Rawalpindi. The Trust's representatives should be invited to Nagarparkar Taluka to review the situation and provide support and guidance if required.

CONCEPTS FOR WATER SUPPLY SCHEMES

- For villages:
 - See what exists
 - Upgrade, improve or multiply it if possible
 - Make it low tech so that the community can manage its O&M
- For settlements of 5,000 and above:
 - Decentralise and miniaturise management systems and technology. This means the building of a number of wells with small pumps rather than a centralised tube well system
 - Ascertain quantum of water in the shallow aquifer before tapping it. If there is a likelihood of depletion of aquifer through pumping, limit extraction and explore the possibility of rainwater harvesting at the para level or at a centralised location such as a dam on a seasonal natural drainage channel
- Promote the solar energy for the extraction and supply of water.

Water Supply Photographs

NAGARPARKAR WATER SUPPLY



NAGARPARKAR WATER SUPPLY



KASBO: WATER SUPPLY

