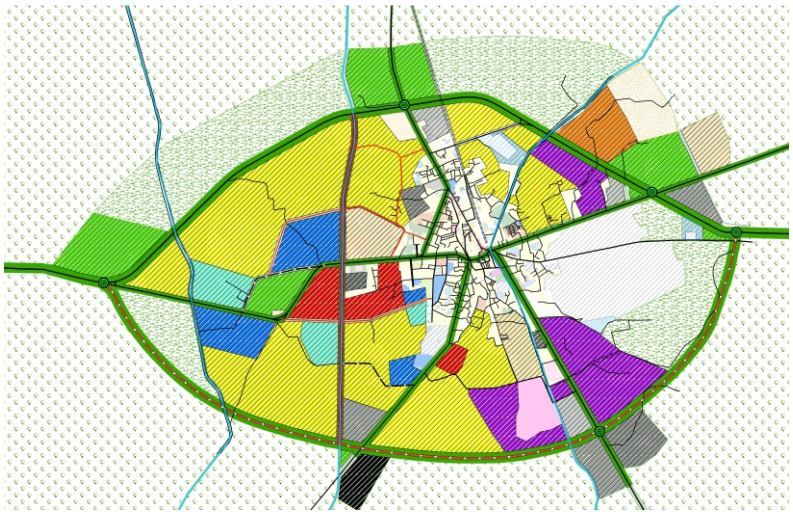
Directorate of Urban Policy Strategic Planning,
P & D Department, Government of Sindh

URBAN POLICY & STRATEGIC PLANNING
P & D DEPARTMENT GOVT OF SINDH

PREPARATION OF DEVELOPMENT MASTER PLANS OF FOURTEEN (14) DISTRICT HEADQUARTER TOWNS OF HYDERABAD, MIRPURKHAS AND SHAHEED BENAZIRABAD DIVISIONS"

STRATEGIC DEVELOPMENT PLAN REPORT

(2017- 37)







Badin

February, 2021

EA Consulting Pvt Ltd
(Formerly Engineering Associates)
Engineering, Architecture & Project Management
Head Office: AL-9, 15th Lane, Khayaban-e-Hilal,
Phase VII, D.H.A., Karachi-75500.,
Tel: UAN: 111-111-584, Fax: (021) 3584-1825

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TRANSMITTAL LETTER

Urbanization in Pakistan is taking place at a substantially high pace most of which is gravitating to the large cities. The secondary cities have not been able to play their role as the "Engine of Economic Growth" due to lack of public funding in the development infrastructure resulting in lop-sided spatial spread. The hinterland has remained poor facing abject poverty due to less economic opportunities, social facilities and institutional support.

Sindh Government took initiative by establishing Directorate of Urban Policy and Strategic Planning (UPSP) within the Planning and Development Department in 2012, to initiate and ensure planned growth of secondary cities of Sindh province through the preparation of Master Development Plans of District Headquarters Towns. In this phase 14 DHQ Towns of Hyderabad, Mirpurkhas and Shaheed Benazirabad Divisions Viz Nawabshah, Sanghar, Naushahro Feroze, Mirpurkhas, Mithi, Umerkot, Tando Muhammad Khan, Tando Allahyar, Mitiari, Badin, Thatta, Sujawal, Dadu, Jamshoro and one SDG compline taluka Islamkot Town.

Directorate of Urban Policy and Strategic Planning initiated Consultant selection process under SPPRA rules. The consortium of three reputable local Consultants led by EA Consulting (Pvt.) Ltd. including MMP (Pvt.) Ltd. and EMC (Pvt.) Ltd was selected due to their high standing in prequalification and lowest financial bid. The Consultants brought together a highly qualified and experienced team to provide the specialized inputs. The data collection was carried out in the field through a sample socio – economic surveys, questionnaires to various government offices and discussions with the stakeholders. The findings and recommendations were submitted to client for review in seven stages and shared with the stakeholders in workshop for each town. This report is the final Deliverable (Strategic Development Plan Report) of the project.

The volume and spatial spread of the project area did present lot of logistics and data availability problems which were resolved with the support of Client who had pursued actively with the various lines departments to assure all available data to Consultants. The Consultant's team is indebted to the Director General UPSP and his team without their support it would not have been possible to complete this project. The consultant would also like to thank all the district officials for making field exercise productive.

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PREPARATION OF DEVELOPMENT MASTER PLANS OF FOURTEEN (14) DISTRICT HEADQUARTER TOWNS OF HYDERABAD, MIRPURKHAS & SHAHEED BENAZIRABAD DIVISIONS

STRATEGIC DEVELOPMENT PLAN REPORT – BADIN

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Annexure – B: Atlas

LIST OF ACRONYMS AND ABBREVIATIONS

ADP	Annual Development Plan
AGR	Annual Growth Rate
BC	Brick Construction
BHU	Basic Health Unit
BOD	Biological Oxygen Demand
CBD	Central Business District
CC	Climate Change
DBM	Digital Base Map
DCs	Deputy Commissioners
DHQ(s)	District Headquarters
DMP	Disaster Management Plan
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DSPC	Development Strategies & Prevalent Condition
DUP&SP	Directorate Of Urban Policy & Strategic Planning, Government of Sindh
ECP	Emergency Contingency Plan
EDP	Economic Development Plan
EMC	Environmental Management Consultants
EPA	Environmental Protection Act
FWO	Frontier Works Organization
GBHS	Government Boys High School
GBHSS	Government Boys High Secondary School
GBLSS	Government Boys Lower Secondary School
GBPS	Government Boys Primary School
GER	Gross Enrolment Ratio
GGHS	Government Girls High School
GGHSS	Government Girls Secondary School
GGLSS	Government Girls Lower Secondary School
GGPS	Government Girls Primary School
GIS	Geographic Information System
GOP	Government of Pakistan
GOS	Government of Sindh
GPS	Global Positioning System
HESCO	Hyderabad Electricity Supply Corporation
HH	Household
HQ	Head Quarters
KA(s)	Katchi Abadis
KV	Kilo Volt
LPG	Liquid Petroleum Gas
LULC	Land Use/Land Cover
MC	Municipal Committee

MISC	Multiple Indicator Cluster Survey
MW	Mega Watt
NER	Net Enrolment Ratio
NGO	Non-Governmental Organization
NPDMP	National & Provisional Disaster Management Policy
NRM	National Reference Manual
O&M	Operation & Maintenance
OH	Over Head
P&D	Planning & Development Department
PCU(s)	Passenger Car Units
PDAO	Planning & Development Act Ordinance
PDMA	Provincial Disaster Management Authority
PGS	Population Growth Scenarios
PH	Peak Hour
PHED	Public Health Engineering Department
PMTs	Pole Mounted Transformers
PR	Public Representative
PTCL	Pakistan Telecommunication Limited
RAP	Resilience & Adaptability Plan
RCC	Reinforced Cement Concrete
SAR	Situation Analysis Report
SB&TPR	Sindh Building & Town Planning Regulation
SBI	Sindh Board Of Investment
SDI	Spatial Data Information
SECP	Securities & Exchange Connection Of Pakistan
SED	Socio Economic Data
SES	Socio Economic Survey
SEPA	Sindh Environmental Protection Agency
SME(s)	Small Medium Enterprises
SOP	Standard Operation Procedures
SPPRA	Sindh Public Procurement Regulatory Authority
SS	Sample Survey
SSGC	Sui Southern Gas Company
STP	Sewerage Treatment Plant
SWM	Solid Waste Management
SWOT	Strength Weaknesses Opportunities Threat
TAY	Tando Allahyar
TOR	Terms Of References
TSS	Total Suspended Solids
TVC	Traffic Volume Count
TW	Tube Well
UC	Union Council
UG	Under Ground
UG/l	Concentration of Arsenic (10 micro-gm/litre)

W&SD	Work & Services Department
WAPDA	Water and Power Development Authority
WATSAN	Water & Sanitation
WASH	Water, Sanitation & Hygiene
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

A. PROJECT AREA BRIEF

District Badin is famous for several shrines of mystic saints including shrine of Shah Qadri. The district is bounded in the north by Tando Allahyar District, in the east by Mirpurkhas and Tharparkar Districts, in the west it borders Sujawal and Tando Muhammad Khan Districts, while in the south by the Rann of Kutch, which also forms the international boundary with India. The district covers an area of 6,726 sq. kilometers with total 2,019 kilometers length of roads. The district comprises of five Talukas: Badin, Matli, Talhar, Tando Bago and Golarchi. District Badin has its district headquarters at Badin City.

The city initially expanded around the railway track. However, later on, the construction of canals resulted in congested development. The built-up area of Badin Town comprises of around 2,334 acres of land but the spread of natural urban boundary is about 8,927 acres. The land use analysis indicates that almost 15% of total urban boundary is in residential use and 45% of the area is covered by agricultural fields. The zonal plan of Badin comprises of six zones.

B. VISION 2037

A vision formulating workshop was carried out with the main stakeholders on November 08, 2018. Collection of opinions expressed produced the following vision;

A vision formulating workshop was carried out with the main stakeholders on November 07, 2018. The stakeholders were mainly local citizens, government officials, businessmen and members of Civil Society. They were so logged down with the immediate day to day problems that they could not articulate a long term vision. However, the collection of opinions expressed produced the following vision:

"The city full filling all the basic needs, such as housing, water supply and sanitation, in clean and sustainable pollution free environment, with education and health for all, along with growth in local and regional economy with increase in employment, incomes and related skills development to emerge as well planned modern city with peace, security and prosperity like some of the best most livable cities in the world."

C. DEMOGRAPHY

According to 2017 census, population of District Badin is 1,804,516 with a growth rate of 2.47%. .The 2017 census reveals that population of Badin Town has reached at about 112,420 souls with a growth rate of 3.11%. Projected population of Badin City works out to be 207,360 souls by 2037.

D. SECTOR WISE ANALYSIS AND PROPOSAL

The Consultants had carried out data collections in three layers:

- Primary source including sample Socio-economic Survey.
- Secondary Source including data from government sources published and unpublished documents
- Discussions with the officials, Consultations with Stakeholders.

The present need analysis and constraints were compiled and submitted in the form of Situation Analysis Report. Consultative Workshops were held in respective DHQ Towns with an objective to validate the accuracy of data and verify the data analysis with the Stakeholders.

Keeping in view the stakeholder's comments and suggestions, the draft strategies were developed to fulfill needs in the most efficient way. The Draft Strategic Development Report submitted by the Consultants was again shared with the Stakeholders and their feedback/comments. Being solicited.

Thereafter, the Final Strategic Report will be submitted. Based on the approved strategies the final action will be the preparation of Long Term/Short Term Plans, Priority Plan and Immediate Action Plan for Core Urban Area.

Based on the evaluation of primary and secondary data, the need assessment has been carried out for a projected population on the basis of 20 years growth projections. The need assessment is based on the Baseline Indicators, Stakeholders Views, Demand vs Need Analysis, NRM with professional judgment and Consultant's own experience and standards used in other developing countries.

1. HOUSING

Housing in terms of affordable home with basic infrastructure and facilities is the basic human need. According to the 2017 census results, Badin Mc had household size of 5.0 persons and a total housing stock of 22,380. General housing condition is satisfactory ,although the major issues in the housing sector includes neglecting household below poverty line, inadequate supply of developed land, poor land administration, unchecked growth of squatter settlements, financial issues, tough and costly documentation and high land prices.

Additional 18,900 houses will be required on fixed household size of 5.0 persons according to the projected population for year 2037. The strategies of short term plan need to be focused on incremental housing

schemes, provision of incentives, development of cost effective approaches, regularization of notified Katchi Abadis, micro-financing, discourage speculation in land prices and increasing number of small size plots. The long term plan involves the identification and acquisition of land, fulfill the need of small house units, affordable housing programme, formulation of green building byelaws, establishment of low-income housing funds and regulatory framework. The priority projects includes the phase wise land acquisition for low income public housing project and Phase wise master planning & infrastructure designing of low income public housing project for additional population. The immediate action is the provision of low income housing for public.

2. SOCIAL AMENITIES

2.1 Education

13,601 children are enrolled in 81 schools with 279 classrooms and 5,262 students are enrolled in 5 colleges and universities with 41 classrooms. The schools are short of 174 classrooms and colleges and universities are short of 91 classrooms on the basis of 30 students per classroom. The major issues of education sector are, the shortage of classrooms, low enrolment level with gender disparity, shortage of teachers and lack of provision of basic facilities.

The future need is 1,749 classrooms in schools and 777 classrooms in colleges and universities by the end of plan period in 2037. The educational authorities should plan to gradually increase the classrooms in existing schools in high density areas and new schools in low density areas. The spatial distribution of schools and other educational institutions should be that schools, especially girl's schools are within easy walking distance. The strategies for short term plan includes increasing equitable access to education, improving the quality of learning outcomes, provision of sufficient funds and bringing ghost schools and absentee staff to the main stream. The long term plan needs to focus on the up gradation of LAAR campus to LAAR University, provision of Medical and Engineering College along Hyderabad-Badin Road, sustainable construction and provision of incentives to attract children to join schools. The priority projects should focus on the addition of classrooms with facilities, improvement of quality of education, training for teachers and establishment of vocational training centers. The immediate action plan is to rehabilitate and upgrade the educational facilities.

2.2 Health

Current health facilities at Badin includes three Taluka HQ Hospitals at District town having 70 beds. One Government sector Civil Hospital having 100 beds and One Government sector major hospital having 20 beds and 47 Government dispensaries, three Semi Government dispensaries, 40 Local Bodies and 46 Private Missionaries, calculating total number of 489 beds. The issues include lack of health facilities, equipment and diagnostic, shortage of doctors and medical staff, inaccessible health care centers from rural areas, shortage of nutrition and lack of trainings for paramedical staff. According to WHO standards, doctor to population ratio is 1:1000, taking this as a reference point currently there are 1,368 doctors required in the district. On the basis of NRM recommendation of 2 beds per thousands, 3,120 beds are required.

On the basis of NRM recommendation approximately 5,385 beds will be required to be provided gradually until 2037 in the district. The future requirement of doctors in the district comes out to be 2,501 doctors. The strategies for short term plan are, improving access to healthcare facilities, improve access through ambulance network, availability of health institutes, provision of effective health equipment, expansion of immunization coverage, additional facilities provided to medical staff and coordinating with the government health department regarding vaccinations and allocation of health budget. The long term plan need to focus on the provision of Tertiary Level Specialized Hospital, enhancement of Mobile Health Unit, availability of ambulance network, accommodation facilities for doctors and paramedic staff, construction of additional BHUs, RHCs and MCHCs, improve health hygiene practices, conduct meetings regarding vaccinations and implementation of Health Insurance Programme. The priority projects should focus on the extension of Civil Hospital, provision of Mobile Health Unit, provision of a quick response ambulance service with all health units, upgradation of BHUs, RHCs and MHCs, research programmes for doctors and provision of diagnostic facilities, ambulance and pharmacy. The immediate action plan involves the rehabilitation of Civil Hospital.

2.3 Recreational

The existing recreational facilities includes two parks i.e. Bagh-e-Benazir and Bilawal Park in the core urban area. There are also shrines of various mystic saints which is visited by many followers.

The strategies for short term plan includes the restoration and maintenance of existing open spaces and development and preservation of cultural heritage. The long term plan includes establishment of sports complex, extension of existing graveyards, and protection of historical places, promote tourism through zoological and botanical gardens and urban forestation. The priority projects need to focus on the rehabilitation and construction of family parks and playground, provision of missing facilities in existing Gymkhana, construction of auditoriums and up gradation of art councils. The immediate action plan involves the construction of multi-purpose sports ground, provision of open green spaces, construction of new parks, rehabilitation of parks and existing football ground.

3. ECONOMIC DEVELOPMENT

3.1 Irrigation

The entire land is irrigated by water coming from Sukkur and Kotri barrages. The irrigation network mainly comprises of Gooni, Phuleli, Akram Wah and Nasir canals.

3.2 Agriculture

Sugarcane is the main cash crop of Badin. The area of district is 612,000 hector out of which 580,000 hector is cultivated area. High price of inputs, inadequate roads, lack of agriculture credit facilities, water logging and salinity and shortage of water makes the crop price unstable.

The strategies for short term plan involves modernizing agriculture, improving food production, agricultural technology development and policy formulation. The long term plan focus on to enhance crop productivity, increase supply and quality of crops and provision of warehouses. The priority projects need

to focus on the feasibility study for kitchen gardening, subsidized fertilizer and pesticide, installation of tube wells, rehabilitation and relining of canals, reduce water logging and salinity and renovation of existing Canal Bridge. The projects for economic development plan involves agriculture credit facilities, regular supply of irrigation water, availability of fertilizer, tube well installation facilities, decreasing water logging and salinity and construction of farm to market roads.

3.3 Livestock and Fisheries

Good breed of buffalos and cows are found in the district. The issues regarding livestock development are landlessness, subsistence farming, limited knowledge and facilities, reduced area for natural grazing, climate change and for every farmer it is a secondary source of income. In the Badin district, animal's population is 2,257,000 for which there are only seven veterinary hospitals and 23 veterinary centers making it insufficient for the requirement. In the Badin district there are 281 private fish farms.

The strategic development plan includes improving and enhancing production performance of livestock, establishing new cattle, dairy farms and veterinary centers, encouraging livestock farming, establishing market mechanism, extension services in private sector, promotion of fisheries, training through schools, issuance of licenses, local awareness, enforcement of fisheries enactment, fish seed stock replenishment and collection of fish data and fish resources. The priority projects focus on the establishment of new cattle and dairy farms and improving veterinary services. The projects for economic development plan are; establishment of livestock farms, dairy farms, new fish farms and poultry farms, develop and implement a broad based fisheries policy, modernize the fisheries sector and promote fish farming under PPP mode.

3.4 Industries

Badin accounts for 44% of the total oil production. National Refinery Ltd. and Pakistan Refinery Ltd process about 65% of Badin crude and condensate and 35% is exported.

The strategies for short term plan involves sufficient market infrastructure, development and establishment of economic and industrial zone, micro-financing small industries, heritage saving, provision of vocational training, shift from industrial agriculture to diversified agro-ecological systems and monitoring of environmental standards. The long term plan focus on the provision of infrastructure for the establishment of new industries, enhancement of colonization, revival of existing oil fields, enhancing crop productivity, extension of Sindh Industrial Estate, support industrial development, modernize service sector and establishment of downstream agro industries. The priority projects should focus on the revitalization and completion of industrial estate Badin, removal of Brick kiln, construction of ware houses and extension of industrial estates. The projects for economic development plan includes the addition in industrial units, incentives for private investor and extension and development of new Industrial Estates.

3.5 Trade and Commerce

Badin has commercial hub in main CBD includes traders, petrol stations, auto shops, medical and general stores with a new fruit market located in the middle of town.

The priority projects should focus on the rehabilitation of slaughter house and provision of parking space for existing commercial areas. Upgradation of old bazar, relocation of wholesale markets, removal of encroachments banning heavy vehicles during peak hours, establishment of fruit, vegetable and specialized wholesale markets, providing building for service industry and provision of cold storage and warehouses. An important step towards economic development will be the encouragement for establishment of financial services in Badin.

4. BASIC UTILITIES

4.1 Water Supply

For present population of 112,420 persons in 2017, the water requirement of the town will be 3.4 mgd whereas the supply is 3.2 mgd. The issues of water supply in Badin Town are collapsed old systems, contamination of water lines by sewage, dysfunctional water supply, ageing infrastructure, poor water quality, inadequate technical capacity and absence of management systems.

By 2037 the water demand projected is 6.2 mgd. The strategies for short term plan are institutional arrangements of water supply schemes should be resolved, access to safe water, supply of water to unserved area and preference given to rehabilitate the existing schemes. The long term plan includes that the design of water supply scheme should ensure no contamination of water and frame a broad policy framework. The priority projects involves the improvement of water intake works, procurement for additional land for water works, construction of OH tank and water filtration plant, rehabilitation of existing water supply network and installation of new water supply network. The immediate action plan includes construction and rehabilitation of existing water supply network, OH tanks and water filtration plant.

4.2 Sewerage and Drainage

The sewage of Badin town moves to the 2 pumping stations and is discharged into the Old Mir Wah. The main problems are maintenance of sewerage facilities, no record of maintenance works, informal settlements, and poor condition of drainage and sewage treatment.

The estimated waste water generation by the year 2037 would be 4.4 mgd whereas presently is 2.4 mgd. The strategies for short term plan includes provision of improved drainage and sewerage services, interventions in sanitation sector, priority given to un-served areas and development of sanitation plan. The long term plan focus on the use of gravity flow system, acquire land and provide proper sewage treatment plants leading up to recycling of treated affluent, integrated water supply waste water treatment scheme be prepared and sewage to be treated before discharging. The priority project should focus on the construction and rehabilitation of drains and rehabilitation of waste water disposal station. Immediate action plan includes the construction of sewage treatment plant.

4.3 Solid Waste Management

There are 06 disposal stations in the town from where garbage is collected. Some of the major issues faced are shortage of machineries, lack of properly organized waste collection system, proper disposal of infectious waste, segregation of organic waste, safe disposal of hazardous waste and implementation of

waste policy framework. The waste generation rate estimated is 0.4-0.5 kg per capita per day with the current (2017) population of MC of Badin as 112,420, the total municipal solid waste load is approx. 50,590 kg per day.

Taking population to be 207,361 in 2037 the landfill area works out to be 311 acre. The strategies for short term plan includes the development of an efficient solid waste management, effective and efficient collection system and segregation for biomedical waste. The long term focuses on the community and private sector involvement, public awareness, encourage on-site reuse and recycling and implement waste minimization. The priority projects need to focus on the feasibility study for construction of composting plant, procurement for land acquisition process for landfill site and introduction of 4Rs. The immediate action plan includes the separate collection of bio-medical waste, construction of solid waste recycling plant, identification of more landfill sites and manage primary collection with their CSR resources.

5. INFRASTRUCTURE

5.1 Energy

Electricity is supplied to only 678 out of 1,547 settlements making it 44% of the total. Little awareness about the fuel conservation and scarcity of alternative fuel sources and their high prices are the major issues.

The strategies for short term plan involves that the wind energy can be utilized as a source of power generation in coastal areas of Badin, solar energy and tidal energy can be converted into electrical energy. The long term plan focus on the effective development of low cost energy production systems, achieving fuel efficiency, adopting new technologies, altering existing fuel use, addition of sub-stations and encourage energy efficient building construction. The priority projects includes upgradation of grid station, promote energy efficient appliances, research for alternate sources and provide LPG and solar panels at low price. The immediate action plan involves the use of Arial Bundle Cable wires, provision of streetlights and installation of wall mounted streetlights.

5.2 Transportation

There are 7 main road networks connecting Badin District to the rest of the country. According to the National Highway Authority, there are 105 road scheme. The major problems are poor road condition, no bus terminals, traffic congestion, unavailability of traffic signals, shortage of public transport, lack of road safety measures, drainage, parking issues and unregularized Qinqui system.

The strategies for short term plan involves creating Traffic Engineering Bureaus(TEBs), expansion of railway station, develop and implement modern route permit, improve road design, removal of encroachments, declare private vehicle free zones, reduce traffic congestion, dualization of main arteries, improving road geometry and rehabilitation of farm to market roads. The priority projects includes the rehabilitation of existing roads, construction of street lighting, improving market access and maintaining sustainable traffic flow. The long term plan focus on to satisfy mobility needs, enhanced institutional efficiency, implementation of Axle Load Management, access roads on both sides of railway station, dualization of

link road between Kadhan-Badin Road and Badin-Naukot Road, provision of truck terminal along Badin-Naukot Road, building a transportation system and rehabilitation and reconstruction of existing roads. The priority projects includes the beautification and rehabilitation of Major Roads (Badin to Hyderabad Road, Badin-khoski Road, etc.), installation of traffic signals and street lighting on main roads. The immediate action plan includes rehabilitation of main town roads including Quaid-e-Azam Road, Shah Nawaz Road and Khoski Road, installation of monuments, provision of street furniture, provision of streetlights on the roads including Quaid-e-Azam Road, Tando Bago-Badin Road, reserve area for railway and provision of railway track buffer.

5.3 Communication

PTCL network is spread in the entire city. During survey it was revealed that only 48 households have landline telephone and 570 households fulfill their need using mobile phones. 110 households out of 634 use internet. There is also press club, printing office and post officer in Badin. A well-maintained communication network are the basic requirement for an efficient and profitable agricultural sector.

6. ENVIRONMENT AND DISASTER RISK MANAGEMENT

6.1 Environment

Badin lies in zone 2A and 2B which corresponds to possibility of minor to moderate seismic hazards. Major changes took place in the hydrology and hydrogeology of Badin district. The supply of contaminated water, unsafe disposal of municipal, solid and infectious waste, and congested housing are the reasons creating environmental degradation. Total forest area of Badin is 11,938 hectares. The issues include water logging and salinity, water contamination, low quality surface water, seismic risk, sewage disposal and aging of surface drainage system.

The strategies for short term plan includes to restrict the disposal of waste into the environment, preservation of ecological cycles, strengthening forestry education, increasing productivity of rangelands, provision of recreational facilities, create environmental awareness, alleviate poverty, conservation of biodiversity and fostering PPP. The long term plans are improvement of drainage, development with environmental considerations and multipronged approach to fisheries management. The priority projects includes Rehabilitation of plantation, enhancing rangeland production, rehabilitation of forest parks and afforestation along Important Highways.

6.2 Disaster Risk Management

The most frequent and damaging disasters in Badin are floods. The problems include low level of risk awareness, not “risk conscious” development, insufficient DRR capacity and absence of permanent organization for relief and rescue.

Some of the objectives of strategic development includes provision of emergency services, creating a capacity to monitor climate change impact, strengthening response capacity, promoting planning addressing disaster risks, support and implementation of DRM policies, strengthening local level Risk Reduction capacity and infrastructure. Set criteria for the declaration of “disaster affected” areas, DRM

strategies and initiatives and creation of an integrated multi-hazard damage loss data are the part of priority projects. The long term plan involves identification of highly vulnerable districts and planning against it, refining the data bases, DRR involving local level actors, provision of disaster relief centers and in need of system which can switch into emergency mode.

E. IMPLEMENTATION

Presently, different proposals or schemes belonging to their respective sectors are identified by the departments and also incorporated separately in the Annual Development Programme (ADP). This creates a lot of problem as there would not be any harmony in the development of the city, as one scheme may create difficulties and problems for the other. It is necessary that all the public service sectors work together as a package that would result in proper development of the town.

The Government of Sindh would take responsibility of implementing various development proposals by utilizing its maximum resources and by engaging various public offices of government of Sindh, established in town. The concerned agency must ensure that the overall process must go after following themes of implementation process. The overall implementation process to be carried out in coordination with Town Planning and Urban Development Standards (Frameworks) in which redevelopment will be phased to prioritization.

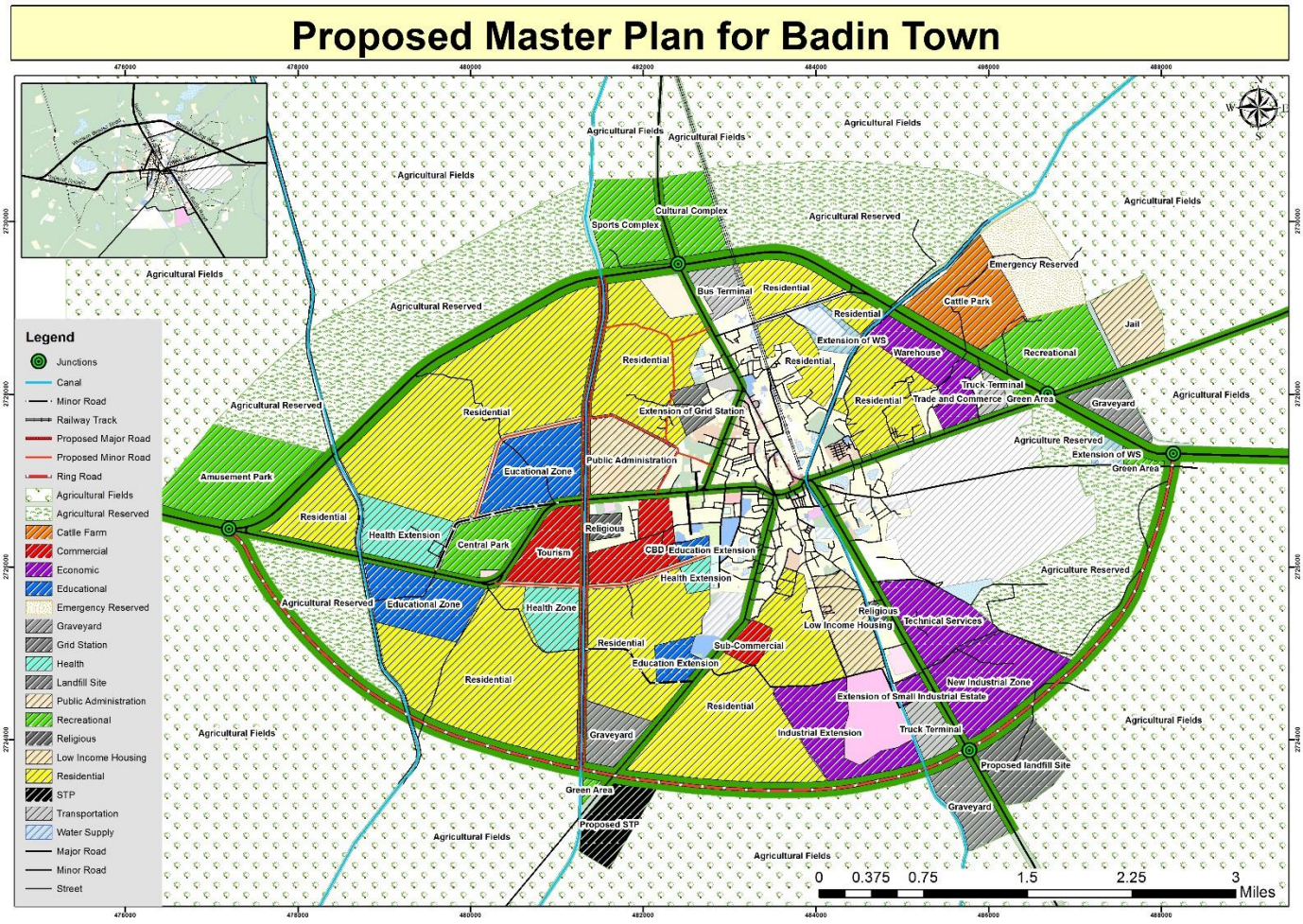
Government may seek technical assistance from all the line department i.e. DUP&SP, Town Planning Department, Municipal Corporation, secretariat of Commissioner and Deputy Commissioner. A committee would be formed as the “Project Management and Implementation Unit” (PMIU) to implement on the Strategic Development Plan. The “Project Management and Implementation Unit” will mainly consist of qualified town and urban planners supported by other technical staff; architects, project managers, engineers, finance officers and any other technical staff expert in their relevant fields.

The “Project Management and Implementation Unit” shall supervise and coordinate respective urban developers involved in development activities, conduct monitory audits, prepare evaluation and impact reports. Planning and development department Government of Sindh shall lead “PMIU” to implement Master Plan.

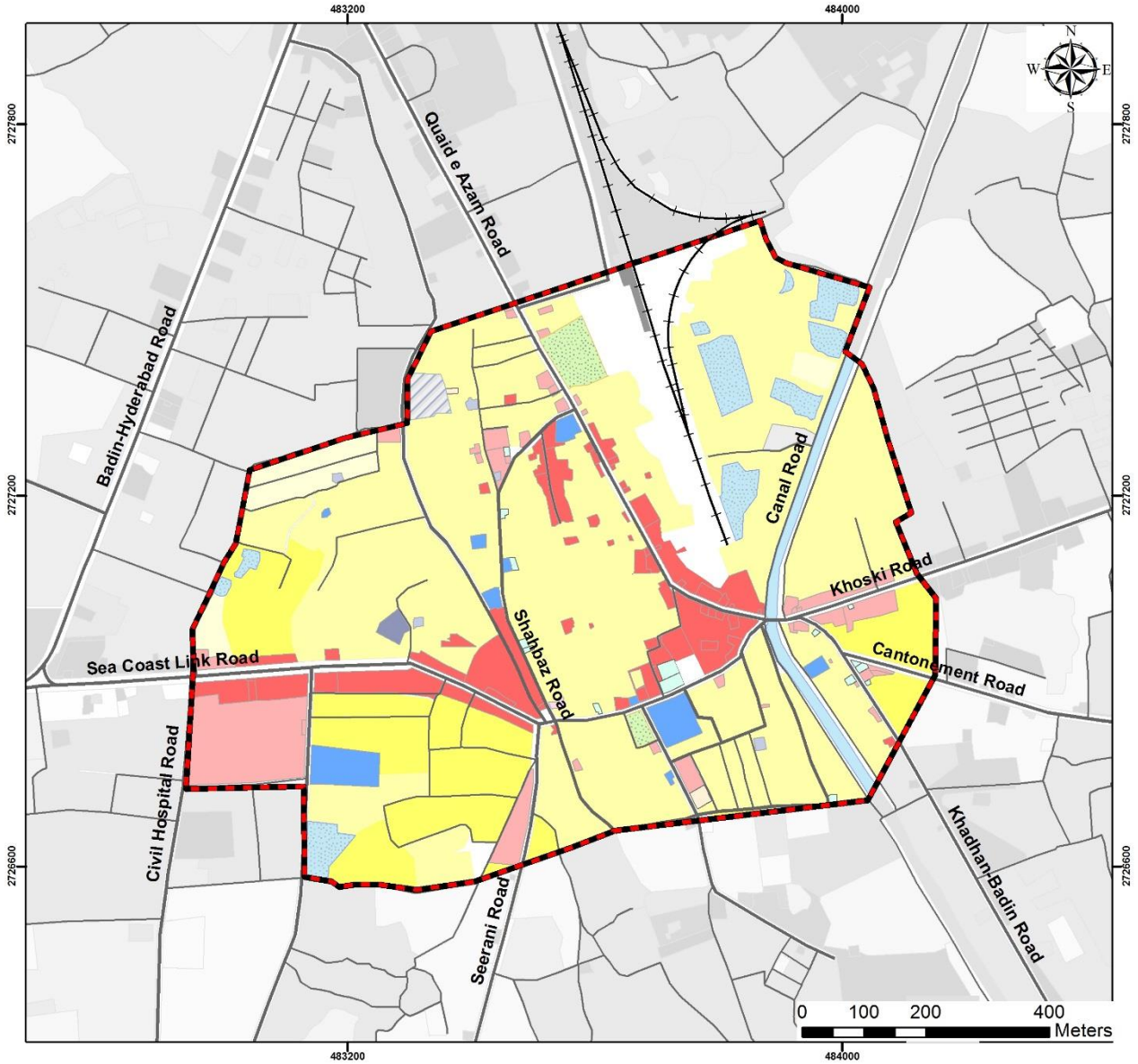
F. STRATEGIES FOR FUTURE DEVELOPMENT

The strategies focus on revitalization the affordable housing, provision of basic facilities, efficient transportation and communication, energy efficient technology, active service sector, implementation of pro-active governance, develop human resources, facilitate social infrastructure, reinforce the local governance institutions, modernize administration, preservation of heritage, sustainable environment, develop tourism resources, involve community participation and implementing Public-Private Partnership.

G. MASTER PLAN PROPOSALS



H. IMMEDIATE ACTION PLAN OF CORE URBAN AREA BADIN



I. SDGS ACCELERATION PLAN:

Under the contract of the Preparation of Development Master Plan of 14 DHQ towns, SDG Acceleration Plan was not part of the approved TORs, however keeping in view the Sindh Government's initiatives to mainstream SDGs targets in provincial planning (taking Islamkot as a model SDG Taluka) the Directorate and Consultant after due consultative process felt the need to include brief SDG Acceleration Plan as part of Development Master Plans. Further in consultation with SDG Unit Sindh, SDG 11 – *Sustainable Cities and Communities* was selected for SDG Acceleration Plan for 14 DHQ towns, since it is pertinent to urban planning and development. Please refer Annexure (A) for brief SDGs Acceleration Plan.

STRATEGIC DEVELOPMENT PLAN FOR BADIN TOWN

1. SINDH – AN OVERVIEW

Sindh is the most urbanized province in Pakistan. Due to lack of interest in the planning and development of secondary cities District Headquarters towns, the public funding in development infrastructure had been sporadic resulting in un-informed adhoc decisions. Consequently the secondary cities have not been able to play their role as "Engines of Economic growth" and hinterland has remained poor facing abject poverty due to less economic opportunities and social facilities. The poverty head count ratio in the urban-cum-rural areas is almost double than that in the declared urban areas.

Sindh government took initiative by establishing Directorate of Urban Policy and Strategic planning within the P & D Department initiate and ensure planned growth of Secondary cities through the Preparation of Master Development Plans of District Headquarter Towns in September 2008.

1.1 Project Background

Sindh, Pakistan's second most populated province plays a pivotal role in the national economic and development agenda. The country's largest port city, Karachi, is the financial capital of the country. The Province comprises of 23% of Pakistan's population and 18% of its land area. It has the highest concentration of urban population at 49% as compared to an overall country average of 32.5%, making it the most urbanized province in the country. With 23% of country's population, its contribution to the national GDP is around 33%. Sindh collects 70% of Pakistan's Income Tax and 62% of Sales Tax.

Sindh has 54% of country's textile units, 45% of its sugar mills, 20% of pulp & paper mills and 35% of edible oil processed locally. Sindh accounts for 34% of total industrial capacity in large scale manufacturing and 25% of small scale manufacturing. Moreover the Province produces 70 % of Country's gas, 30% petroleum and 95% of Coal.

Despite global economic slowdown towards the end of 2008 and Pakistan's solidarity with the International cause for peace, playing a key role as the front line state, Sindh's manufacturing sector has been resilient and investments have continued to pour in the economic cycle. MNCs and local enterprises are committed to make investments worth around USD 8.0 billion in the province in coming years.

Sindh's diversified economy also comprises of a well-developed agricultural base supported by an effective irrigation network on the River Indus. Around 14% wheat, 30% rice, 30% sugar cane, 25% cotton and 30% vegetable crops grown in Pakistan are from Sindh. This provides immense opportunity for setting up export based agri-processing industry in the province. (http://www.sbi.gos.pk/sindh-economy.php).

1.2 General Issues

Despite of its significant contribution in National GDP, Sindh has not received the priority in development funding as it deserves. DUP&SP is the medium through which grass root development / strategy is being formulated by professionals for the betterment of people and create de-centralize economical hubs to counter higher migration rate towards developed urban centres resulting better socioeconomic condition of the people. While going through the available literature so far, several issues have been identified in this regards, such as:

- Non-existence of Sustainable planning policy, apparatus, regulatory framework and its implementation;
- Absence of current housing policy based on sustainable and smart growth mechanism;
- Lack of coordination between institutions responsible for development of a town or Absence of Institutional Framework.
- Previous Master / Development / Structure Plans of Town Planning Department have hardly been implemented due to poor implementation mechanism;
- Local cultural preferences and settlement patterns undermine the role of urbanization in supporting economic growth;
- In most of the District Headquarters Towns, in-effective municipal infrastructure and service delivery is a common cause of failures in water, waste water, SWM, etc.
- Non-existence of spatial and non-spatial database systems;

1.3 Objectives

The objective of the assignment, as mentioned in the TORs is to prepare Development Master Plans of Fourteen (14) District Headquarter Towns of Hyderabad, Mirpurkhas and Shaheed Benazirabad Divisions; for development of spatial planning and zoning system as well as local economic development strategies on the basis on ecological sustainability.

The Consultant is tasked to prepare strategies:

- To plan for social infrastructure at affordable standards for education, health, recreation and cultural needs.
- To upgrade the existing physical infrastructure and enhance the supply of potable water and to propose the required capacity of network for water supply, sewerage, drainage, flood waters till year 2037.
- To provide for modern sanitation, solid waste management and disposal.
- To improve existing road networks, extend links, upgrade intersections, bridges and flyovers; and other means of communication and proposed where needed.
- To provide for safe and efficient public transport.
- To plan for effective traffic management, smooth transit and provide for parking facilities, where required in multi-storey car parks.
- To plan for enhancement and revitalization of economic base by expansion of industrial and commercial base, and for rapid expansion of IT and Telecom sectors, tourism, agricultural activity, etc in the means of sustainable and smart concept.
- To propose alternate energy sources as country is facing acute shortage especially in summer season.

1.4 The Strategic Plan output

The proposed Development Master Plans of selected District Headquarter Towns of Sindh would focus on the following Tasks

- Review of Past Trends, Development Strategies and Prevalent Conditions
- Preparation of Digital Base Maps
- SWOT Analysis
- Carving out a Vision for the Future of these cities
- Preparation of Development Plan comprising of:
    - Long Term Development Plan
    - Growth Scenarios
    - Short Term Action Plans for Priority Infrastructures
    - Immediate Action Plan for the Core Urban Areas
    - Economic Development Plan
    - Disaster Management Plan and
    - Climate Change, Resilience & Adaptability Plans

2. AN OVERVIEW OF BADIN AND ITS ENVIRONMENT

2.1 Badin District at Glance

Badin is among one of the most important coastal districts of the Sindh Province. Badin District is situated between latitude $24^0$13' to $25^0$12' North and longitude $68^0$21' to $69^0$20' East.

According to the Population and Housing census of 2017, the official figure for district Badin is 1,804,516 souls with an average annual growth rate of 2.60%. the estimated Household size for district Badin is 5.0.

The district is bounded in the north by Tando Allahyar, in the east by Mirpurkhas and Tharparkar districts in the south by the Arabian Sea and Rann of Kutch, which also forms the International boundary with India, and in the west, it borders Thatta and Tando Muhammad Khan districts.

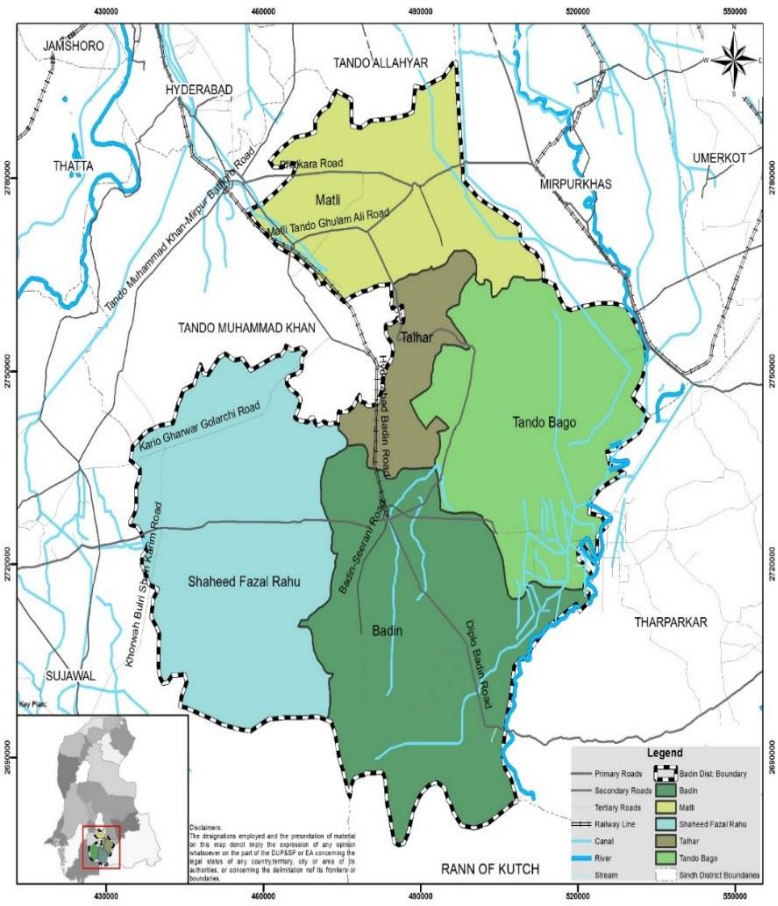


Figure 2:1: Tehsil Map of Badin

With the introduction of the Devolution System, the talukas have been sub-divided into 44 union councils, 109 tapas, and 511 dehs. Badin has a mild climate. Rainfall is highly erratic and unpredictable with an average rainfall of 258.8 mm.

Badin, on the whole, is a low and flat district. The entire district depends, for its cultivation on several canals taking off from the Indus River. The net cropped area has increased owing to constant improvement and extension of canals. Rice is the main crop of the district and is grown where ever the level of the land permits it. The other crops grown in the district are cotton, Jawar, wheat and barley.

2.1.1 Geographical Location

Badin District is situated between latitude 24013' to 25012' North and longitude 68021' to 69020' East. This district is bounded by district Tando Allahyar in north, in the east by Mirpurkhas and Tharparkar Districts in the west by thatta and Tando Muhammad Khan districts and in the south by the Arbian sea and Rann of Kutch.

Boundaries:

East: District Mirpurkhas and Tharparkar
West: District Thatta and Tando Muhammad Khan
North: District Tando Allahyar
South: Arbian Sea and Rann of Kutch

2.1.2 Topography, Geology and Soils

District Badin is a part of the Lower Indus Plain formed by the alluvial deposits of the Indus River. The southern part of the district is close to the delta of the river Indus and the land surface, therefore relatively low lying as compared to the northern half. The general elevation of the district is about 50 metres above sea level. In the southern part, there are several natural channels (dhoras) and depressions (dhands) which in some cases retain water throughout the year. It is believed that in the past, the Arabian Sea was near the southern border of this district.

2.1.3 Demography

Pakistan is among those four countries where life expectancy for females, at birth, is less than that of males, and as such the male population outnumbers the female population. The sex ratio in Badin is 107 males per 100 females, which is more than the ratio of 106:100 at the National level. 52% of Badin's male population and 84% of its total population reside in rural areas. However, there could be other socioeconomic reasons for such a difference in male to female ratio.

Table 2-1 Demographic Statistics: District Badin

Project Area	Population		AGR		Average Household Size		Housing Units	
	Census 1998	Census 2017	Census 1998	Census 2017	Census 1998	Census 2017	Census 1998	Census 2017
District Badin	1,106,272	1,804,516	2.26	2.60	5.3	5.0	211,354	359,376
Source: Census 1998 and 2017								

2.1.4 Climate

Badin has a mild climate. Rainfall is highly erratic and unpredictable with an average rainfall of 258.8 mm. The district is part of the Lower Indus plane formed by the alluvial deposits of the Indus River. Thus, its land is very uniform and it is not diversified by hills or rivers; in fact, there are no rivers or streams in the district. The climate of Badin is relatively mild. The sea breezes keep the summers relatively cool. During the monsoon period the sky is usually cloudy, but there is very little precipitation. The climate in summer is generally moist and humid. The cold weather in Badin starts from the beginning of November, where there is a sudden change in temperature.

2.1.5 Ethnicity and Culture

The population of the district is mainly Muslim, constituting 79.43% of the total population. Hindus form an important minority at 19.9% in the district followed by Christians at 0.3%. Important tribes include the Halepotas and the Hingoras. However, Syeds, Soomras, Talpurs, Legharis, Bhurghris, Memons, Mandhras, Maheris, Ansaris, Samas, Junejas, Sheedis and Mallahs also inhabit the area. New settlers come mainly from the Punjab and Baluchistan regions.

Sindhi is the primary language in the district, spoken by 89.8% of the population. The language is spoken predominantly in the rural areas (92.2%) as compared to 77.7% in the urban areas. The next widely spoken languages are Urdu with 1.2%, Seraiki with 0.6% and Balochi with 0.21% has a mild climate. Rainfall is highly erratic and unpredictable with an average rainfall of 258.8 mm. The district is part of the Lower Indus plane formed by the alluvial deposits of the Indus River. Thus, its land is very uniform and it is not diversified by hills or rivers; in fact, there are no rivers or streams in the district. The climate of Badin is relatively mild. The sea breezes keep the summers relatively cool. During the monsoon period the sky is usually cloudy, but there is very little precipitation. The climate in summer is generally moist and humid. The cold weather in Badin starts from the beginning of November, where there is a sudden change in temperature.

2.1.6 Historical / Famous Places in Badin District

There are several shrines of mystic saints in around Badin, which include shirnes of Shahabuddin, Mian Ali, Saman Sarkar and Shah Qadri. Shah Qadri's Shrine is greatly revered by both Hindus and Muslims. The most renowned shrine in Badin is that of Khwaja Muhammad Zaman of Lawari Sharif, located at 10 km from Badin.

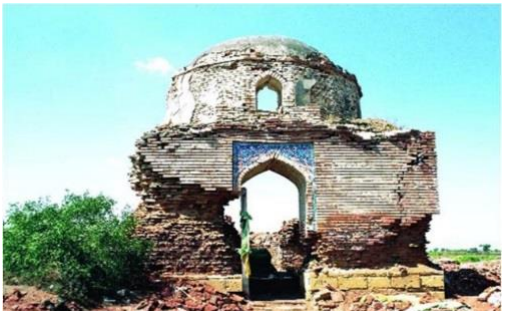


Figure 2:2: The dilapidated tomb of Shahabuddin



Figure 2:3: Tomb of Shah Qadri



Figure 2:4: Shrine of Saman Sarkar

2.1.7 Administrative Set-up

In the administrative hierarchy, the district is headed by Deputy Commissioner who performs the function. He is also responsible for the coordination of function of all nation-building departments in the districts. For the purpose of Provincial Government administration, the district has been divided into five talukas, namely Badin, Talhar, Matli, Tando Bago and Golarchi (Shaheed Fazal Rahu), and three Sub-Divisions. The local bodies set up includes two Municipal Committees which are known as Badin and Matli and 8 Town Committees namely, Tando Ghulam Ali, Khoski, Tando Bago, Rajo Khanani, Talhar, Kadhan, Kario Ghanwar and Golarchi. At the level of Union Council for rural areas there are 44 Union Councils constituted with 502 dehs.

Table 2-2: Administrative Division of District Badin

Badin	Krungo Circled / Supervisory Tapas	Patwar Circles / Tapas	Number of Dehs					
			Total	Rural	Urban	Partly Urban	Forest	Un-Populated
Badin Taluka	3	25	140	128	7	4	1	-
Talhar Taluka	2	10	54	50	4	-	-	-
Shaheed Fazal Rahu	3	22	95	87	3	5	-	-
Matli Taluka	3	27	98	95	2	4	-	-
Tando Bago Taluka	3	29	110	106	-	1	-	-
Total	**14**	**103**	**497**	**466**	**16**	**14**	**1**	**-**

Source: *Deh Statistics of Sindh 208, Agriculture Census Organization.*

2.1.8 Major Linkages

Badin is a small but important town in southern Sindh. It is situated at 93 Km (58 miles) east of Thatta, and 50 Km (31 miles) south of Tando Mohammad Khan. The Runn of Kutch is located at about 53 Km (33 miles) to the south of Badin. Badin is well connected with all these places by road. The road to Thatta runs westward upto Karachi. The total the geographical area i.e. 6,726 square kilometres, whereas the total length of roads of both primary and secondary type is, 2019 kilometres, the length of road per square km as per geographical area is 0.30 km which is insufficient as compared to the rush of motor vehicles and farms to market transportation.

2.2 Badin Town

2.2.1 History

The history of the district is more akin to the history of lower Sindh. Historically, the area was the centre of the ancient Indus Valley Civilization. Some of the places in Sindh have been inhabited as early as the 3rd millennium BC. A large number of Indus Valley Civilization sites have been found in Sindh. Sindh was ruled by local Hindu and Buddhist rulers until 712 CE when it was invaded by the Arabs and incorporated into part of the Umayyad Caliphate. The area remained under the rule of the caliphate until its control was taken over by the Ghaznavids, a Muslim dynasty of Turkic slave origin.

For the next few centuries local, tribes and foreign kings vied for power in Sindh the Sumras, a Rajput tribe, took lower Sindh from the Ghaznavids, while upper Sindh remained in the hands of the Ghaznavids. In time, Upper Sindh was absorbed into the Delhi Sultanate. The Sumras were overthrown by Alauddin Khilji, the second king of the Khilji Dynasty that had established itself in Delhi. The Sammas, another Rajput tribe, established their rule in Sindh in 1333. The most famous of the Samma rulers was Jam Nizamuddin II who made Thatta his capital. After the death of his son in 1554, the Turkhan Dynasty took control of Sindh.

in 1592, Akbar seized Sindh and made it part of the Mughal Empire,.As Mughal authority began to deteriorate, a local tribe by the name of Daudputras established their rule over upper Sindh and founded the town of Shikarpur. In the late 1600s, another local tribe, the Kalhoras, also began to oppose Mughal authority. In 1719, the Kalhoras took the Shikarpur area from the Daudputras and eventually ruled over the territories from Multan to Thatta. In 1739, Nadir Shah of Iran claimed all the Mughal provinces west of the Indus and upon his death, they passed into the hands of the Durranis. The Kalhoras continued to rule in Sindh under the suzerainty of the Durranis. In 1783, the Talpurs established themselves after a long struggle with the Kalhoras.

In 1843, the British waged two successful battles against the Talpurs and shortly thereafter annexed Sindh into their dominion. Sindh was added to the Bombay Presidency, a move that the local population found highly offensive. By 1936 it was made a separate province. The Sindh assembly was the first British Indian legislature to pass the resolution in favor of Pakistan. Sindh is part of Bombay Presidency

The Government of India Act 1935 made the Bombay Presidency into a regular province and made Sindh a separate province in 1936. Subsequently, as a result of the partition of the subcontinent, Sindh became part of Pakistan. Badin was announced as one of the districts of Sindh province in 1975, by the then Prime Minister, Mr. Zufiqar Ali Bhutto.

2.2.2 **Geography**

Badin lies on 24^0 38' 45'' latitude and 68^0 50' 48'' longitude.

2.2.3 **Demography**

According to the 1998 census, the population of Badin town was 62,843 souls with a growth rate of 5.91 and an average household size of 5.91. Badin town has a slow growth rate which is evident in the table below. The latest population and housing census of Badin reveal that the population of the town has increased to 112,420 with a decrease in the annual growth rate of 3.11%.

Table 2-3: Comparison of Past and Present Population Statistics

Area	Population		AGR %		Average HH Size	
	Census 1998	Census 2017	Census 1998	Census 2017	Census 1998	Census 2017
Badin MC	62,843	112,420	5.91	3.11	5.9	5.0
Badin Taluka	289,259	455,295	2.58	1.31	5.2	4.9
Badin District	1,106,272	1,804,516	2.26	2.60	5.3	5.0
Source: Census 1998, and Census 2017						

- **Future Population**

  In 1998 Population of Badin MC was 62,843 and in 2017 census population of Badin jumped to 112,420 Based on the annual growth rate of 2017 census population i.e. 3.11% of Municipal committee, Taluka, and District of Badin is projected as under

Table 2-4: Future Projections for Badin

S. No.	Year	Badin Town	Badin Taluka	Badin District
1	1998	62,843	289,259	1,106,272
2	2017	112,420	455,295	1,804,516
3	2022	131,023	485,908	2,051,623
4	2027	152,704	518,580	2,332,568
5	2032	177,974	553,449	2,651,986
6	2037	207,424	590,662	3,015,143
Source: Census 2017 and Consultants Projections				

2.3 Urban Morphology

After the construction of the railway track in 1906, the city, initially expanded around the track. However, later on, with the construction of canals, the traditional linear growth pattern was disturbed, resulting in congested development and thickly populated areas.

The administrative complex and offices are situated along the major roads i.e. Badin-Sujawal Road, Tando Bagio Road, Hyderabad-Badin Road, and Badin-Seerani Road. Major offices present in the city are SSP office, NADRA Office, Regional Passport Office, DC Office, Session Court, etc. District headquarter town can be divided into two tracts: northern and southern tract. Most public projects are established along the Badin-Sujawal Road, longitudinally, while commercial activities take place along both sides of the Badin-Sujawal Road.

Badin town is expanding in the north-west direction of railway track and the Badin-Sujawal Road, whereas the north-east direction is mainly used for poultry and livestock rearing. A land parcel located in the southern part of city is designated for Badin small industrial estate.

Badin is a sufficiently large transport centre. Its main link is with Hyderabad. A blacktop carpeted road also runs between Badin and Hyderabad which connects Matli and Tando Muhammad Khan on the regional linkage. Buses and wagons go around the whole day between the two places at short intervals. Due to its location, Badin is contributing a reasonable part of economic activities for mostly agricultural products with Karachi through road and railway tracks via Thatta.

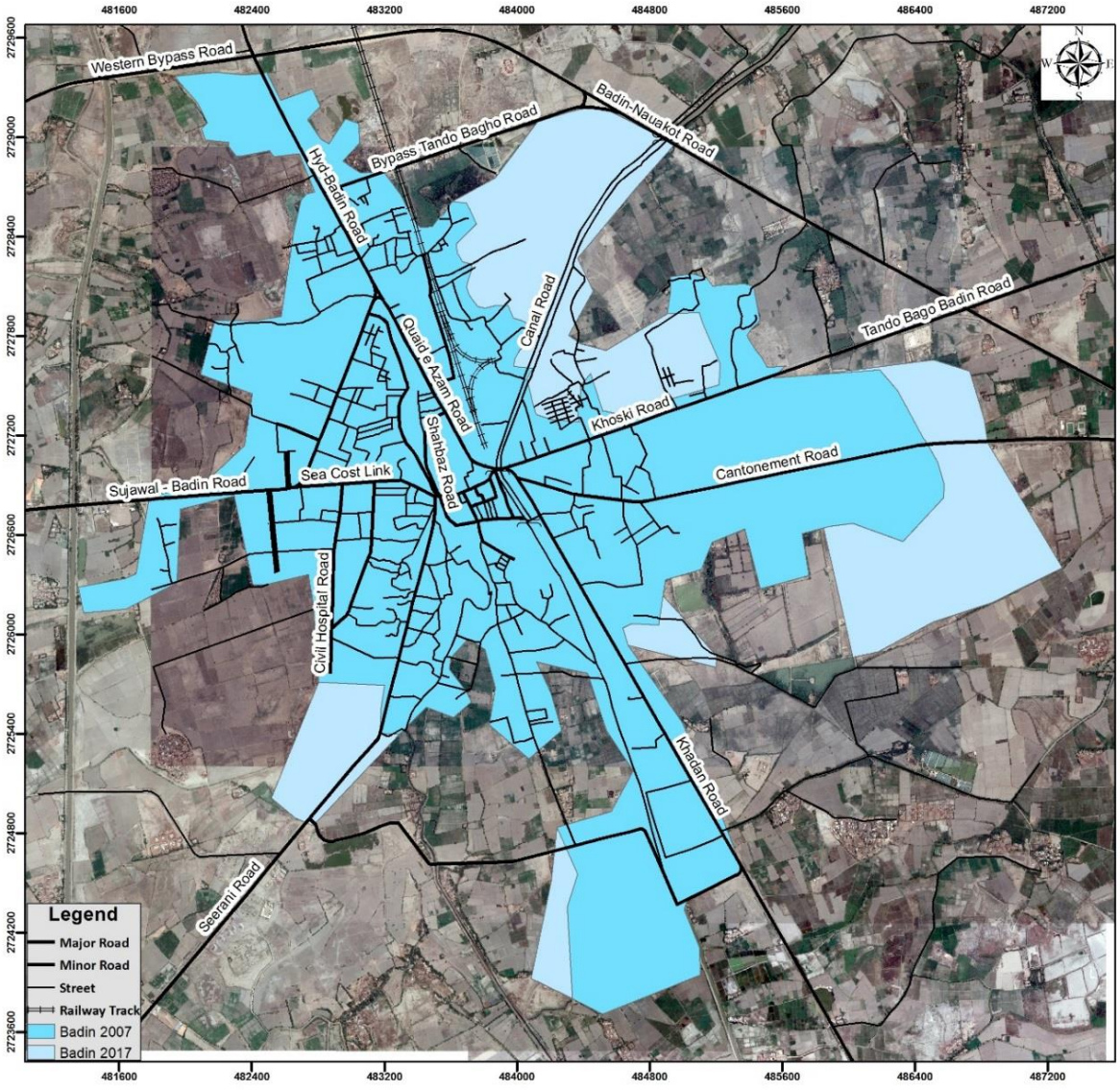


Figure 2:5: Historical Growth of Badin

2.4 Land Use and Spatial Analysis

The built-up area of Badin town comprises of around 2,3340 acres of land as compare to natural urban boundary which is about 8,927 acres. The land use analysis indicates that almost 15% of total urban boundary area is in use of residential purpose only and 45% of the area is covered by agriculture fields.

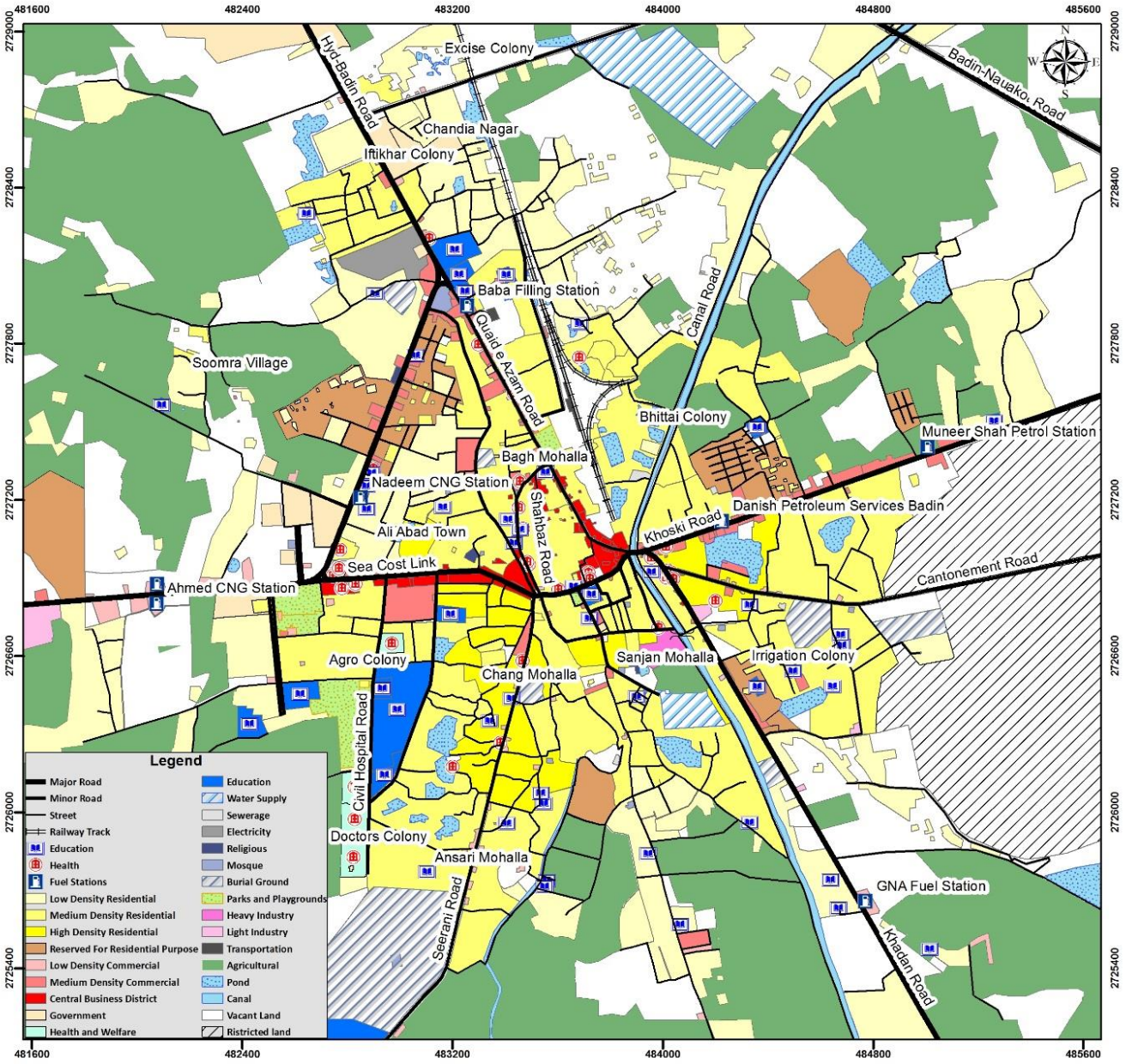


Figure 2:6: Land Use Map of Badin

Table 2-5: Spatial Analysis of Land use Classification [1]

Badin (URBAN BOUNDARY)					Acres
CATEGORIES	**LANDUSE CLASSIFICATION**			**AREA (ACRES)**	**%**
URBAN	Residential	Residential	Low Density Residential	704.6	7.9
			Medium Density Residential	312.9	3.5
			High Density Residential	78.4	0.9
			Mix Development	130.9	1.5
			Proposed Housing Schemes	131.0	1.5
	Sub Total			1357.8	15.2
	Commercial	Commercial	Low Density Commercial	24.1	0.3
			Medium Density Commercial	53.8	0.6
			High Density Commercial	17.8	0.2
	Sub Total			95.7	1.1
	Parks and Playground	Parks and Playground	Parks and Playgrounds	22.3	0.3
	Sub Total			22.3	0.3
	Amenities	Institutional	Education	63.9	0.7
			Public Administration	92.0	1.0
			Health And Welfare	14.4	0.2
			Religious	4.0	0.0
		Utilities And Municipal Service Facilities	Electricity	9.8	0.1
			Sewerage	0.6	0.0
			Communication	0.3	0.0
			Water Supply	57.7	0.6
		Burial Ground	Burial Ground	78.2	0.9
	Sub Total			320.9	3.6
	Cantonment	**Cantonment**		766.9	8.6
	Industrial	Manufacturing	Small-Scale Manufacturing/ Light Industry	37.9	0.4
			Large-Scale Manufacturing/ Heavy Industry	145.0	1.6
	Sub Total			182.9	2.0
	Transportation	Transportation	Transportation	360.0	4.0
	Sub Total			360.0	4.0
	Sub Total			2339.7	26.2
NON-URBAN	Agriculture And Forestry		Agricultural	4008.1	44.9
	Sub Total			4008.1	44.9
	Water Bodies		Canal	90.0	1.0
			Water Bodies	125.1	1.4
	Sub Total			215.1	2.4
	Vacant Area			1597.1	17.9
	Total			1597.1	17.9
TOTAL				**8926.9**	**100.0**

[1] Source: Spatial Analysis done by Consultants

2.5 City Scape

Zone 1:

This zone is triangularly bound with three major roads i.e. Quaid-e-Azam, Sea Coast Link and Hyderabad Badin Roads. Most of the commercial activities are happening in this central zone. Shahbaz Road is passing through the center of the zone, which is an old commercial strip like Quaid-e-Azam and Sea Coast Link Roads. New development pattern is found towards Hyderabad Badin Road.

Zone 2:

The Zone 3 is in north and northeast direction along Khoski / Tando Bago and Quaid-e-Azam / Hyderabad Roads. The main features in the area are railway track, railway station, canal with roads on both side, Benazir Park, Football Ground, Circuit House and Metrological Office. In addition trend of new housing schemes is also found in this zone.

Zone 3:

Zone 2 lies in northwest direction along Hyderabad and Sujawal Roads. It is mainly comprises of DC Office, District Session Court, Grid Station and Police Headquarter. Other than these uses trend of future housing development is also visible and will grow with the vacant land parcels.

Zone 4:

It lies in southwest direction along Sea Coast Link / Sujawal and Seerani Roads. This zone is rich in social infrastructure like health, educational, recreational. The well-known institutes are present in this zone namely; Civil Hospital, Sindh University Laar Campus, Polytechnic College, Govt. Girls College, Govt. Islamia College, Gymkhana, Laar Museum, Pir Ali Shah Jilani Ground, Shah Qadri Shrine and Graveyard. Another important feature of SMBBT Badin lies in southern side along Seerani Road.

Zone 5:

This Zone lies in the southward direction in between Kadhan and Seerani Roads. Parallel to Kadhan Road, there is a canal passing with roads on both sides. It consist of Industrial Estate, Bilawal Park, Boys School, Post Office, Tableeghi Markaz, Sugar Mill etc. Zone 5 is spreading haphazardly towards south side due to the presence of road infrastructure and industrial development.

Zone 6:

This zone lies in south east direction in between Kadhan and Khoski / Tando Bago Roads. It is bounded by the Cantonment Area from east side, while the Cantonment Road is passing through the center of the zone. This is a haphazardly grown area with intermix of residential, schools, clinics, mosques and commercial activities.

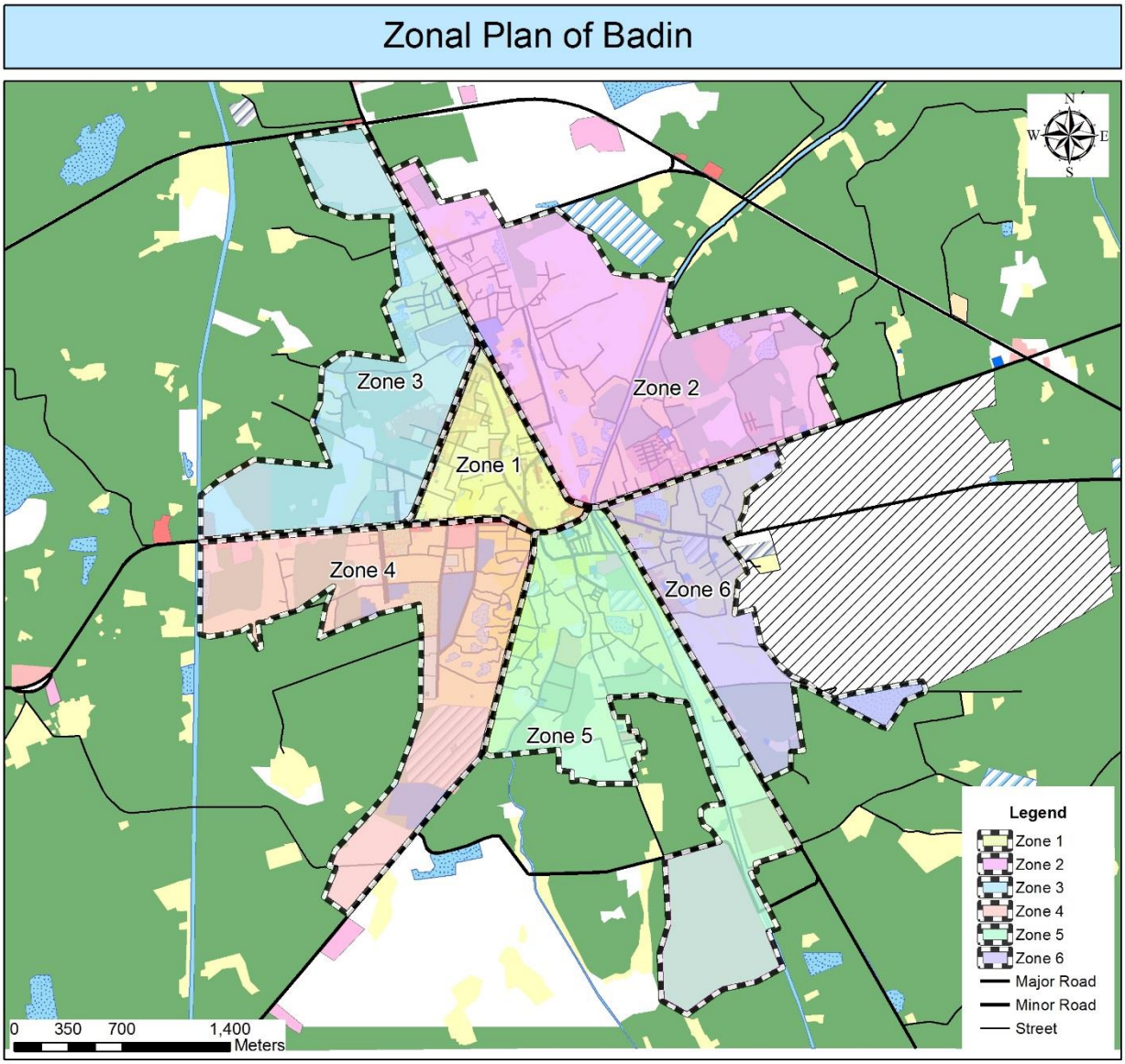


Figure 2:7: Existing Zonal Plan

3. VISION FOR STRATEGIC DEVELOPMENT PLAN OF BADIN

Having gone through a detailed process of data collection and evaluation in the previous stages of the study and obtaining citizens input through the Consultative workshops with the stakeholders, the Consultants have identified development issues in the various sectors and provided sector wise strategies to resolve issues in an integrated manner. The issues are running of the development programmes. As funds are never unlimited, it would be utmost necessary to concentrate on projects that being meaningful and quick relief in the life of common man and significantly the quality of life. In the sections of the Report to follow, sector wise development strategies are listed. The focus should be to select projects which have a strong sequential links is the form of a "package" rather than stand-alone project.

3.1 Summation of Vision Formulation

For Vision Formulation, a Consultative workshop was held in Hyderabad (Divisional Headquarter) at Indus Hotel on November 08, 2018 in coordination with Directorate of Urban Policy & Strategic Planning (DUP&SP).

A presentation on the existing situation was made by the Consultants highlighting the issues, constraints and potential of the town. During workshop almost all stakeholders were actively participated and discussed the social & physical issues of the town. The stakeholders have also shared their views about the future development options and investment decisions for the town. A rigorous session of free expression for the selection of the vision statement followed.



The basic aim of vision formulation exercise is to have pluralistic approach to establish a shared and common vision for the development of Badin DHQ town in the future, define its role as a leading regional centre in the Sindh province and the socio-economic uplift of the population.

The summations and conclusions are described hereunder:

1) Although the participants generally understood that vision should reflect citizens and stakeholders' aspirations as to where they want to see their town in twenty years from now. However, their focus has been remained on the resolution of immediate problems namely; supply of clean drinking water, sewerage and drainage, solid waste disposal, traffic congestion and parking, better health and educational facilities, cleanliness, parks and play areas. It is clear that far flung high sounding vision statements, are meaning less for them if the immediate problems are not urgently solved.
2) The participants showed concern regarding high rate of population growth and migration. Urbanization and uncontrolled land use conversion is eating away lots of urban agricultural land and breaking social fabric of residential communities. Need for land management system has been stressed.

3) The socio- economic uplift of the population has been mentioned by most participants, which include provision of basic needs of housing facilities with sustainable utility services, health, education, parks and playgrounds, employment and income generation.
4) Peace, safety, security and proper governance are envisioned by the participants as the ultimate goal for the twenty year Badin's Strategic Development Plan. Whereas the Vision will remain static, the path to reach the vision may be subject to adjustments to account for ground realities.

3.2 Badin's Vision Statement

The visioning process stems from the Stakeholders' Vision of the town which have been translated into tangible and concrete targets. The discussions in the Workshop that most people want to see:

Where a lot of investment is expected to be made;

The priority will first be given to improve the Core Urban Area of DHQ town. And then could go to remaining town and Peri-urban areas.

Existing utilities including water supply, sewerage & drainage as well as facilities are in bad state of repairs due to shortage of funds. The government should make sufficient fund allocations for the repairs and rehabilitation of existing facilities.

BADIN VISION 2037

"The city full filling all the basic needs, such as housing, water supply and sanitation, in clean and sustainable pollution free environment, with education and health for all, along with growth in local and regional economy with increase in employment, incomes and related skills development to emerge as well planned modern city with peace, security and prosperity like some of the best most livable cities in the world."

PROPOSED MASTER PLAN OF BADIN TOWN

4. PROPOSED MASTER PLAN OF BADIN

4.1 Spatial Pattern

Badin is the headquarter town of Badin District and also a significant town of southern Sindh. Badin is among one of the most important coastal districts of Sindh and it also forms international boundary with India from south. The history of the district is more akin to the history of lower Sindh. Historically, the area was the center of the ancient Indus Valley Civilization.

Badin on the whole is a low and flat district. The entire district depends for its cultivation on several canals taking off from the Indus River. Rice is the main crop of the district and is grown wherever the level of the land permits it. The other crops grown in the district are cotton, Jawar, wheat and barley.

District Badin is a part of the Lower Indus Plain formed by the alluvial deposits of the Indus River. The southern part of the district is close to the delta of the river Indus and the land surface, therefore relatively low lying as compared to the northern half.

There are several shrines of mystic saints in around Badin, which include shirnes of Shahabuddin, Mian Ali, Saman Sarkar and Shah Qadri. Shah Qadri's Shrine is greatly revered by both Hindus and Muslims. The most renowned shrine in Badin is that of Khwaja Muhammad Zaman of Lawari Sharif, located at 10 km from Badin.

After the construction of the railway track in 1906, the city initially expanded around the track. However, later on, with the construction of canals, the traditional linear growth pattern was disturbed, resulting in congested development and thickly populated areas.

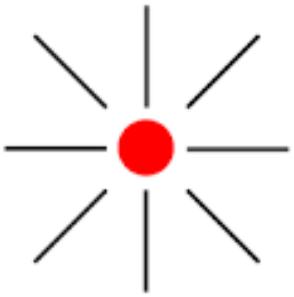
Badin is a sufficiently large transport center due to its location and it is contributing a reasonable part of economic activities for mostly agricultural products. It has two main links; one is with Karachi via Thatta and Sujawal, while other is with Hyderabad which connects Matli and Tando Muhammad Khan as regional linkages.

The present town of Badin can be divided into two tracts: northern and southern tract. Most of the development is in both horizontal and vertical directions along important roads of Sujawal, Tando Bago, Hyderabad and Seerani. The administrative complex and offices are situated along the Sujawal and Hyderabad Roads. Likewise, commercial activities also take place along both sides of the Sujawal and Hyderabad Roads. Major offices present in the city are SSP office, NADRA Office, Regional Passport Office, DC Office, Session Court, etc.

Badin town is expanding in the northwest direction of railway track and Sujawal Road, whereas the northeast direction is mainly used for poultry and livestock rearing and in southeast Badin Cantonment exist. A land parcel located in the southern part of city is designated for Badin Small Industrial Estate along Kadhan Road. Thus it is concluded that Badin Town is mostly occupied from eastern side and now moving towards western side.

4.2 Basic Urban Form

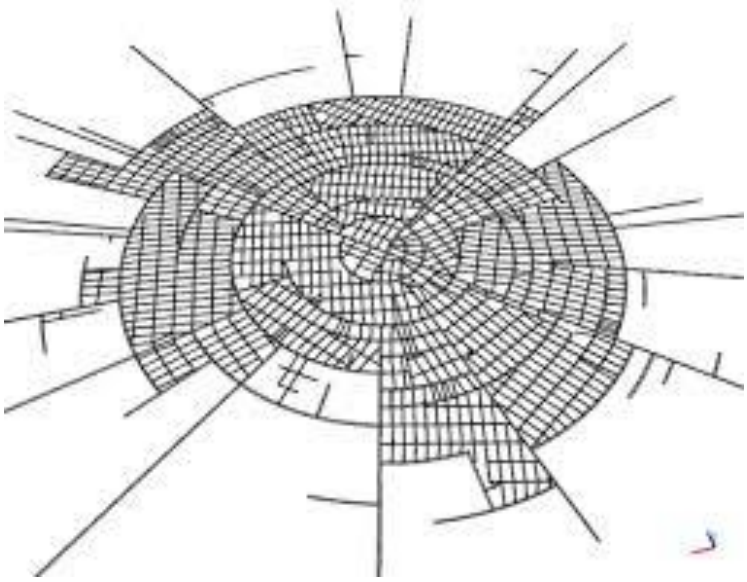
The existing town is a medium size lively and thriving urban center that fulfils the socio-economic and financial needs of its population and of surrounding towns. Especially those are not along major connectivity corridors are benefited, like Matli, Tando Bago, Talhar and Shaheed Fazal Rahu Talukas.



It is no surprise then that the population demands the uniqueness and prominence of the existing town to be maintained or enhanced in the future plan. During the stakeholder's conference, the town elders insisted that any future urban development detached from the existing town making the existing town a redundant, will not be acceptable to them.

The existing core town would naturally be the physical nucleus of the future town, and the future development will radiate from it in all directions in form of different sectors.

At present there are six major radial roads of Hyderabad, Sujawal, Tando Bago, Seerani, Kadhan and Canal. Most of these roads are converging to the town center. However, the horizontal link of Sujawal Road and Tando Bago Road divides Badin Town into northern and southern tracts.



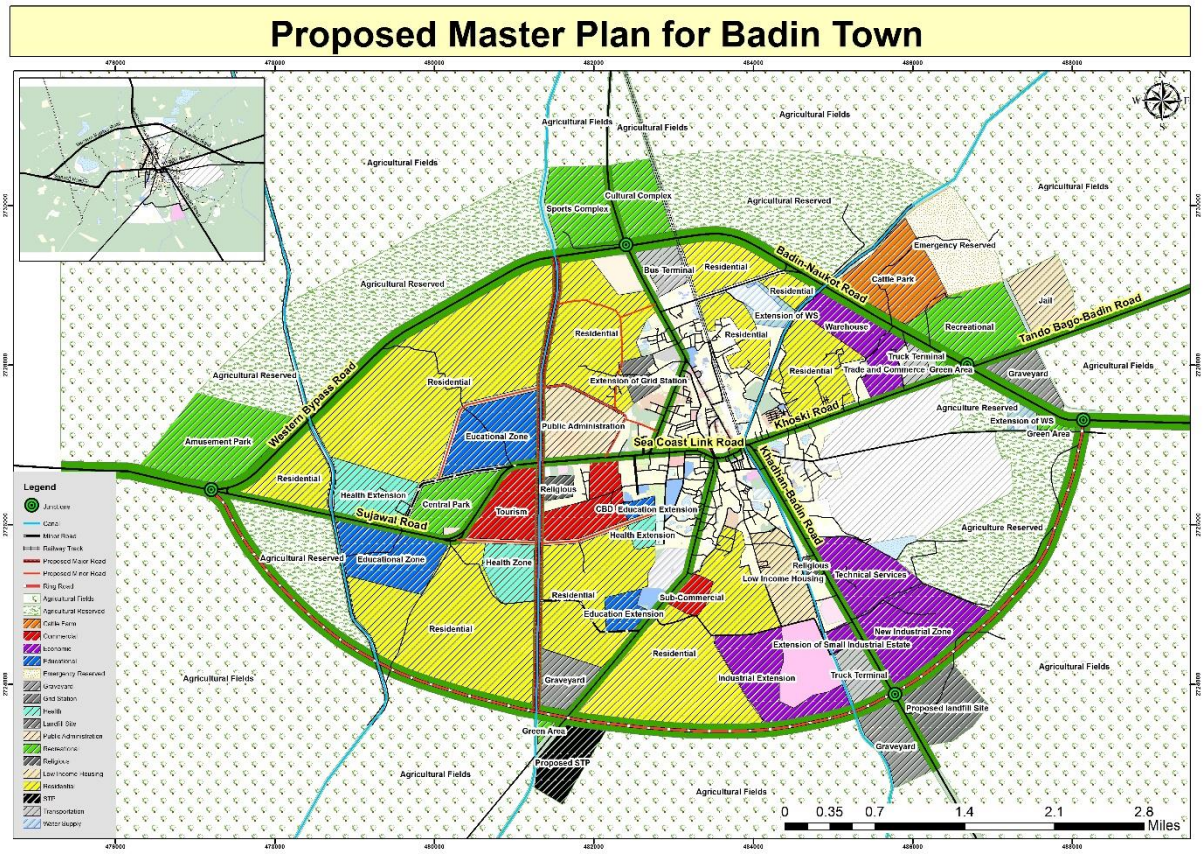
There is Badin-Naukot Road acting as an existing bypass in the north of the town. This bypass termed as Northern Bypass of Badin Town is providing northern connections with Hyderabad and Canal Roads.

Since this town is not large enough in terms of its spatial spread then its projected future population, thus the alignment of another bypass is made in southern side. This Southern Bypass is a newly proposed bypass, more or less a mirror of Northern Bypass, forming an eye shape. In addition a New Canal Road is also proposed at west side of the town, providing vertical link by connecting Northern and Southern Bypasses. In this way, interconnection of the radiating roads with the existing and proposed bypasses around the proposed master plan, will keeps the development compact.

4.3 Proposed Master Plan

The Proposed Master Plan for Badin has been prepared with the consideration of three phases as follows:

i. Immediate Phase - Immediate Action Plan
ii. Short Term Phase - Priority Projects
iii. Long Term Phase – Strategic Development Plan



The total extent of the area included in the overall proposed Badin Master Plan is 16,000 acres approx. for a population of 207,400 by 2037. In this way, Badin Town in next twenty years is expected to have population density of 13 persons per acre and overall eight housing units per acre with an average household size of 5.0.

The hallmark of the plan is that it is compact without being congested. As the future expansion of the Badin Town is expected to be large, thus the complete Proposed Badin Master Plan is catering for all the needs of a full-fledged metropolis of the future. Thus the plan will afford balanced development containing all required land uses.

The overall structure of the plan is an eye shaped, in which two flattened curves are connecting each other in horizontal manner. These curves are Northern and Southern Bypasses around the town, forming

connectivity in north and south directions. The New CBD with Tourism and Public Administration Area have been designated along Sujawal Road, slightly towards west of the town. A New Canal Road is proposed to provide vertical connectivity to new development areas. Furthermore, a sub center is placed at Seerani Road, for commercial activities in southern side as well. The other prime activities are placed around the existing town, within two bypasses in compressed curvilinear form. Thus the intersection of radial roads and bypasses will also create main junctions and forming different sectors.

Despite taking different aspects in to consideration, the Consultant suggest that the Master Planning should be reviewed every five years to estimate the land use and area requirement according to the growth rate and economic investment.

4.4 Salient Features of Planning:

- As the new development of both public and private sector are in western part of the town, thus the main CBD (Central Business Districts) occurs slightly towards west side of the town, accessible from existing Sujawal Road. In addition, a sub commercial area is also identified to reduce the burden over the main CBD; along Seerani Road, as Hyderabad and Tando Bago Roads are already occupied with commercial activities.
- Tourism Area is placed next to New CBD, also has direct access to Sujawal Road. Since another beautiful canal is passing in north-south direction, a New Canal Road is formed in between New CBD and Tourism Area.
- Considering connectivity of Northern Bypass with Sujawal and Naukot; Warehouses, Trade and Commerce, and Truck Terminal are placed. These are also accessible from Tando Bago and Canal Roads respectively.
- As the existing Small Industrial Estate is lying along Kadhan Road, thus its extension, with truck terminal is proposed there too. Moreover a much larger area for Technical Services and New Industrial Area are proposed on other side of Kadhan Road.
- Other than two Truck Terminals, a Public Transport Terminal is designated along Hyderabad Road in northern direction.
- The two areas for graveyards have also been reserved, one is along Seerani Road and another is along Tando Bago Road.
- The cattle park is proposed in the northeastern direction, accessible from Northern Bypass, and Canal Road, to limit the town development further. It will also benefit the population of nearby villages and other settlements.
- As DHQ Hospital is newly constructed along Sujawal Road, large health and educational zones are suggested here, accessible from newly proposed roads as well.
- Next to Tourism Area; a Central Park is proposed, while Sports and Cultural Complexes are proposed in north along Hyderabad Road. Further two large recreational zones are placed along Sujawal and Tando Bago Roads.
- Since District Commissioner Office is at Sujawal Road, the New Public Administration area is proposed adjacent to it, to serve and manage this beautiful city of Badin. Moreover an extension of District Jail is also suggested along Tando Bago Road.

- Along Northern and Southern Bypasses, the areas have been reserved for agriculture, as these areas are benefitted with the existing irrigation network. This will be helpful in restricting housing development and preserving the agricultural farms from the onslaught of the housing projects by private sectors.

4.5 Northern and Southern Bypasses

Considering the existing Badin-Naukot Road in north and a need of southern connectivity; a combination of two bypasses is suggested despite of typical ring road. However, these bypasses are connecting each other and forming two flattened curves. The further detail is as follow:

i. Northern Bypass: The existing Badin-Naukot Road is already serving as a bypass in the north of the town and also providing northern connections with Hyderabad and Canal Roads. Thus it is recommended as Northern Bypass of Badin Town, forming an upper eyelid.
ii. Southern Bypass: There is also a need to limit the southern development in proper form, a Southern Bypass is proposed. This newly proposed bypass, more or less is a mirror of Northern Bypass, forming lower eyelid. It is connecting Northern Bypass in west at Sujawal Road and in east at Naukot Road. And it also providing connections to Seerani and Kadhan Roads.

The recommendations are to increase the right of way i.e. 200 feet with urban forestation of 200 feet wide on both sides of the bypasses. As the areas on both sides of the bypasses will attract many developers. The land two hundred feet on both sides of the bypasses should be notified for development control where only planting of local trees should be allowed.

4.6 Radial Roads with Horizontal and Vertical Linkages – Regional Connectivity

All proposed radial roads are existing major roads, providing transport connectivity with other urban and rural regional areas. Most of these roads are converging to core urban area, or in other words these roads are originating from the existing town. In this way, the existing town will remain focal point of all development along the roads. However, these roads are also serving as vital radial regional connections.

As a result, there are six proposed radial roads with increased ROW, which will serve as future regional connections. These roads includes; Hyderabad, Sujawal, Tando Bago, Seerani, Kadhan and Canal Roads. However it is very important to control upfront development along the major roads. Likewise existing and proposed bypasses, on both sides of major roads planting of local trees is also highly recommended.

Other than radial connectivity, in Badin Town horizontal and vertical linkages are also formed:

- Horizontal Link: The amalgamation of Sujawal Road and Tando Bago Road is already established as horizontal link, by merging northern and southern part of Badin Town.
- Vertical Link: A New Canal Road is proposed at west side of the town, developing vertical link in between Northern and Southern Bypasses.

4.6 Proposed Land Use Zoning

The proposed land use zoning is broadly based on NRM Standards[2]. The NRM has not been revised since decades, thus the Consultant have added new land uses in the prescribed categories, as primary zoning i.e. Level-1. Further, as per the contextual requirement of the local environment of Badin as DHQ Town, secondary zoning i.e. Level-2, is also categorized accordingly, again in consideration to the NRM Standards[3]. The proposed land use zoning is shown in the table:

S.No	NRM STANDARDS		PROPOSED LAND USE CLASSIFICATION		
	Land Use Zoning	Land Uses (%)	Level - 1 Functional Zoning	Areas (acres approx.)	Land Uses (%)
1	Residential	40-45%	Residential	5,253	32.7%
2	Commercial	2-3%	Commercial	411	2.6%
3	Industrial	2-10%	Economic	1,253	7.8%
			Livestock		
			Industrial		
4	Institutional	3-5%	Health and Welfare	2,051	12.8%
			Educational		
			Religious		
			Public Administration		
5	Community Open Spaces	4-6%	Recreational	1,047	6.5%
6	Graveyards	2-3%	Graveyards	363	2.3%
7	Arterial Circulation & Terminals	15-20%	Transportation	1,752	10.9%
			Utilities and Services		
8	Protected Reserved	15-25%	Urban Forestation	3,918	24.4%
			Agriculture		
			Water Bodies		
			Vacant / Reserved		
	Total Area of Proposed Master Plan of Badin Town			16,048	100%

The total area requirement for full fledge metropolis of Badin will be around 16,000 acres. As shown in the table of proposed land use classification, the percentage of residential and commercial zones are slightly lower, in comparison to the NRM standards. Since the town has a trend of medium density development, thus it is expected that most of the residential and commercial development will required less space in comparison to other towns. However, the institutional area is of higher value, as it also contain a large area of Badin Cantonment. In addition it will also contain residences for employees / staff and some related commercial activities are also associated with institutional areas. In this way, institutional area is sharing the commercial and residential load as well.

[2] Guidelines for Land Allocation to Zones in the Preliminary Design of a New Town, Table 10.3, page no. 305, National Reference Manual on Planning and Infrastructure Standards

[3] Standard Land Use Classification for Urban Jurisdictions in Pakistan, Appendix 10.1, page no. 398, National Reference Manual on Planning and Infrastructure Standards

Table 4-1: Proposed Land Use Classification for Badin

S.No	PROPOSED LAND USE CLASSIFICATION FOR BADIN TOWN						
	Level - 1 Functional Zoning	Level - 2 Functional Zoning	Areas (acres approx.)		Land Uses (%)	Areas (acres approx.)	Land Uses (%)
1	Residential	Existing Residential	1,358	5,253	32.7%	5,253	32.7%
		Proposed Residential	3,895				
2	Commercial	Existing Commercial	96	411	2.6%	411	2.6%
		New Central Business District	143				
		Tourism	130				
		Sub Coomercial at Seeerani Road	42				
3	Economic	Trade and Commerce	66	348	2.2%	1,253	7.8%
		Warehouses	99				
		Technical Services	183				
4	Livestock	Cattle Farms	231	231	1.4%		
5	Industrial	Existing Industries	183	674	4.2%		
		Extension of Small Industrial Area	22				
		Extension Industrial Area	201				
		New Industrial Area	268				
6	Health and Welfare	Existing Health and Welfare	14	296	1.8%	2,051	12.8%
		Health Zone North (DHQ Extension)	148				
		Health Zone South	104				
		Civil Hospital Exrtension	30				
7	Educational	Existing Educational	64	546	3.4%		
		Educational Zone North	211				
		Educational Zone South	197				
		College Extension at Seerani Road	52				
		Vocational Center	22				
8	Religious	Existing Religious	4	40	0.2%		
		Religious near CBD	26				
		Religious at Kadhan Road	10				
9	Public Administration	Existing Public Adminitration	92	1,169	7.3%		
		New Public Administration Area	166				
		District Jail with extension	144				
		Cantonment Badin	767				

10	Recreational	Existing Parks and Playground	22	1,047	6.5%	1,047	6.5%
		Central Park	139				
		Sports Complex	184				
		Cultural Complex	128				
		Amusement Park	321				
		Festival Grounds	226				
		Green Area	27				
11	Graveyards	Existing Graveyards	78	363	2.3%	363	2.3%
		Graveyard along Tando Bago Road	76				
		Graveyard along Seerani Road	92				
		Graveyards along Kadhan Road	117				
12	Transportation	Existing Transportation	360	1,310	8.2%	1,752	10.9%
		Public Transport Terminal at Hyderbad Road	59				
		Truck Transport Terminal at Tando Bago Road	30				
		Truck Transport Terminal at Kadhan Road	66				
		Road Network	795				
13	Utilities and Services	Existing Utilities and Services	68	442	2.8%		
		Water Supply	50				
		Sewerage	119				
		Land Fill	160				
		Electricity	45				
14	Urban Forestation	Urban Forestation	635	635	4.0%	3,918	24.4%
15	Agriculture	Agricultural Reserved	2,920	2,920	18.2%		
16	Water Bodies	Canals and Ponds	132	132	0.8%		
17	Vacant	Emergency Reserved	231	231	1.4%		
		Total Area for Future Development of Badin	16,048	16,048	100%	16,048	100%

4.6.1 Residential Zone

The important features of the proposed master plan is accommodation of all income groups with diverse options for housing. Therefore in total 5,250 acres of residential land use is proposed, which will create eight housing units per acre on average. Thus in overall town more than 42,000 housing units are expected to be in town by 2037.

There are existing vacant land parcels in overall town, specially in south and west of the core urban area have a considerable potential of infill development for residential use. This will somehow fulfill the partial need of new migrants coming from other areas in search of better living in the immediate phase. For low income group in short term phase (priority project) land of 140 acres accessible from Kadhan Road is proposed for medium to high density development. While for other income groups, mixed density (low, medium and high) residential areas are proposed. Moving ahead, for the long term phase, areas are also being reserved for residential development as per future requirement, which will also include apartment buildings.

The following land use division is for New Residential Schemes according to Sindh Building & Town Planning Regulations of Sindh Building Control Authority:

The Level II secondary zoning of residential land use will be as follow:

- **Houses**
  Taking the existing trend of housing, it is recommended to concentrate more towards houses, as the cultural context favor low to medium density housing development. However, it is preferred to follow the standards and give ample spaces to neighborhood facilities as well.

Table 4-2: New Residential Scheme

New Residential Scheme [4]		
S. No.	**Land Use**	**SBCA Standards**
1	**Residential**	55% max
2	**Commercial**	5% max
3	**Parks**	5% min
4	**Playgrounds**	5% min
5	**Public Uses**	5% min
6	**Educational**	3% min
7	**Roads**	22% min

[4] Land Allocation for New Residential Schemes as per Sindh Building & Town Planning Regulations, Chapter 20.4.1, page no 124.

The following guidelines are for houses zone development:

Permitted Uses	Allied Permissible Uses	Prohibited Uses
- Houses - Neighborhood level facilities like small commercial, parks, playgrounds, schools, religious, parking	- Utilities and services - Road accessibility - Pedestrian friendly streetscape - Mixed-used structures	- Apartments - Large health and educational - Large commercial activities

Houses - Applicable SBCA Bylaws[5]

Types	Densities per acre	Plot Sizes sq.yds	Foot Print FP %	Floor Area Ratio – FAR	No. of Floors
Low Density Houses	50 – 100	1,000 or above	40% - 45%	1:1	G+2 (max)
Medium Density Houses	100 - 200	400 to 999	50% - 55%	1:1 - 1:1.5	G+2 (max)
High Density Houses	200 - 300	120 to 399	65% - 75%	1:1.8 - 1:2	G+2 (max)

- **Apartments**

In Badin Town, the trend of vertical residential and commercial development is very less but existing. Secondly, as new migrants are expected from other urban areas as well, thus there is a need to fulfill the modern residential need like apartments. On the other hand, apartments are more effective in accommodating large number of households in less acres of land due to increased density in comparison to houses. It is not necessary to build a concrete jungle, however with better design and new ideas different type of walkable as well as high rise could be made. The main focus should be to provide open and green areas as breathing spaces in between apartment buildings as per the standards.

The following guidelines are for apartment zone development:

Permitted Uses	Allied Permissible Uses	Prohibited Uses
- Apartments - Designated parking areas - Small commercial - Parks and playgrounds - Prayer areas	- Utilities and services - Road accessibility - Pedestrian friendly streetscape - Mixed-used structures	- Large health and educational institution - Large commercial activities

Apartments - Applicable SBCA Bylaws[6]

Types	Densities[7] per acre	Apartment Sizes sq.ft	Foot Print FP %	Floor Area Ratio - FAR	No. of Floors
Low Density Apartments	325	2,500 – 4,000	40%	1:2.75	G+6 (max)
Medium Density Apartments	500	1,500 – 2,500	40%	1:2.75	G+6 (max)
High Density Apartments	650	1,000 - 1,500	40%	1:2.75	G+6 (max)

[5] Houses/Bungalows, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.2, page no 141.
[6] Flat Sites Category, Zoning Regulations /Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.4, page no 144.
[7] Residential Density Standards, as per Sindh Building & Town Planning Regulations, Chapter 20.3, page no 123.

4.6.2 Commercial Zone

This zone is mainly mixed use commercial with state of art buildings. The smart development will be preferred from medium to high density and less foot print, in order to utilize the land efficiently with sufficient open and green spaces.

The Level II secondary zoning of commercial land use will be as follow:

- **New CBD (Commercial Business District)**
  Considering the shape and trend of new development in the town, the New CBD has been located slightly towards west along Sujawal Road. In addition to existing horizontal link, a vertical connectivity is also proposed for New CBD i.e. New Canal Road, to provide access in north-south direction as well. The main land uses of the CBD will be regional corporate headquarters, financial centers, media houses, IT / software, specialized production service and retail shopping outlets with dedicated parking and large open spaces. This will integrate a great deal of financial, business, culture, service institutions and lots of supporting facilities; such as business office buildings, large shopping malls, hotels and apartments, etc. These will be developed with perfect and convenient traffic, communications and other infrastructures, favorable economic development, environment friendly places; which are convenient for commercial activities.

- **Tourism Area**
  Badin and it's environ have several shrines of mystic saints of historical significance including; shirnes of Khwaja Muhammad Zaman, Shahabuddin, Mian Ali, Saman Sarkar and Shah Qadri. Out of these, Shah Qadri's Shrine is greatly revered by both Hindus and Muslims and shrine of Khwaja Muhammad Zaman of Lawari Sharif is the most renowned shrine in Badin.

  On the other hand, Badin is also a transport hub due to regional level economic activities with two major links i.e. Karachi and Hyderabad. The travelling for business purpose is also generating demand for tourism related facilities. Considering the potential of tourism, the Tourism Area is proposed next to New CBD, which will accommodate convention center, expo center, hotels, shopping malls, exhibition ground, etc.

- **Sub Commercial Center**
  In continuation to the main CBD, it is recommended to place sub commercial centers to share the burden of commercial activities. Since along Hyderabad and Tando Bago Roads, in north and east directions respectively, commercial development is already existing. Thus, along Seerani Road a sub commercial center is proposed, to accommodate commercial facilities in southern side as well. Further small commercials within the residential areas will be formed for retail commercial activities of everyday goods required to fulfill the daily need of the residents.

The following guidelines are for commercial zone development:

Permitted Uses	Allied Permissible Uses
- Corporate head office buildings, towers - Huge markets, malls, outlets - Large public squares and parks - Dedicated parking lots / spaces	- Pedestrian friendly streetscape - Mixed-used buildings - Medium to High Rise Apartments - Fueling stations
Applicable SBCA Bylaws[89]	**Prohibited Uses**
- Plot Sizes: 1,000 sq.yds. (min) - FP: 40% - 65% - FAR: 1:2.75 – 1:5.5 - Floors: G+6 & G+8 (max)	- Residential housing schemes - Large health and educational institution

4.6.3 Economic Zone

In view of contextual requirement, the emphasis is given to other economic activities also, instead of only industrial development. The main criteria is to rely on local economic potentials, which mostly related to technical service and upcoming new type of markets.

The Level II secondary zoning of economic land use will be as follow:

- **Trade and Commerce**
  In northeast side of the town along Northern Bypass, trade and commerce area is positioned. It is placed in a way that it is also accessible from Tando Bago Road. This will provide in and out trading activities of the region specially to other areas of the district. It will includes grains, fruit and vegetable markets, wholesale markets, slaughter house, storage areas etc.

- **Warehouses**
  The warehouses area is proposed next to trade and commerce along Northern Bypass, also accessible from Canal Road. For all of these trading activities large to small scale warehouses will be required, comprises of general, bulk, liquid, dry and cold storage as well. These should be well equipped with all the required technology of good storage and management like CCTV surveillance, in and out data entry.

- **Technical Services**
  An area for Technical Services is suggested along Kadhan Road, opposite to existing Small Industrial Estate. This area will provide space for technical services like mechanical workshops and spare parts (auto mobile repairing), building construction materials, home depots, furniture market, housewares, food and beverages, computer hardware etc. However with the

[8] Commercial, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.3, page no 143.
[9] Flat Sites Category, Zoning Regulations /Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.4, page no 144.

passage of time, technological advancement and changing needs; new requirement will come up to cater to the job market through new economic opportunities and activities.

The following guidelines are for economic zone development:

Permitted Uses	Allied Permissible Uses
- Warehouses and Workshops - Godowns and Cold Storage - Trade and Commerce Areas - Showrooms or Display Centers	- Mixed-used buildings - Residences for workers - Fueling stations
Applicable SBCA Bylaws[10]	**Prohibited Uses**
- Plot Sizes: o Small size: upto 0.5 acres o Medium size: 0.5 to 5 acres o Large size: 5 acres or above - FP: 60% - 70% - FAR: 1:2.5 - 1:1.5 - Floors: G+1 & G+2 (max)	- Private Residential housing schemes - Large health and educational institution

4.6.4 Livestock Zone

Since Badin is not only an agricultural and industrial town, local inhabitants also rely on livestock for another source of income. In this regard livestock zone is placed in northeast direction along Northern Bypass, to promote livestock production. The main emphasis is to be given to cattle production and their required facilities and services. In addition poultry is another requirement to fulfil through the livestock zone.

The Level II secondary zoning of livestock land use will be as follow:

- **Veterinary Hospital and College**
  A full-fledged veterinary hospital and college is proposed to cater to livestock health requirements and to produce more vet doctors.

- **Dairy Production[11]**
  Dairy area will be facilitated with mandi / cattle market, artificial insemination center, slaughter house, milk collection unit, chiller storage unit, fodder storage and purchase, bio gas plant etc.

[10] Industrial Areas, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.6, page no 145.
[11] Dairy Plots, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.8, page no 149.

- **Cattle Farms with Pasture and Grazing Lands**
  Cattle area will contain mainly cattle farms that could accommodate buffaloes, cows, sheep, goats, camel, poultry and ostrich; with pasture and grazing lands around the farms.

  The following guidelines are for livestock zone development:

Permitted Uses	Allied Permissible Uses	Prohibited Uses
- Cattle Farms - Poultry Farms - Pasture and grazing lands - Slaughter Houses - Dairy production - Veterinary services - Veterinary education and training	- Low rise ancillary structures - Residences of caretakers - Related commercial activities - Fueling stations - Godowns and cold storage - Cattle market	- Other than permitted and permissible

4.6.5 Industrial Zone

In order to increase employment opportunities and production activities; industrial areas need to be developed. It will create more jobs, investment options, open new markets and at the end of the day will boost the economy of the town.

The following land use division is for New Industrial Estate according to Sindh Building & Town Planning Regulations of Sindh Building Control Authority:

Table 4-3: New Industrial Estate

New Industrial Estate [12]		
S. No.	**Land Use**	**SBCA Standards**
1	**Industrial**	70% max
2	**Commercial**	1% max
3	**Parks / Playground**	3% min
4	**Public Uses**	6% min
5	**Roads**	20% min
6	**Residential**	8% min
No roads shall be less than 40 feet in small industries. No roads shall be less than 50 feet in medium and large industries. Industrial plot of 5 acres or more, residential area for labor and staff is allowed at rear.		

[12] Land Allocation for New Industrial Estate as per Sindh Building & Town Planning Regulations, Chapter 20.4.2, page no 124.

The Level II secondary zoning of economic land use will be as follow:

- **Extension of Small Industrial Estate**
  The Small Industrial Estate of 30 acres area is already present in south of Badin Town along Kadhan Road. Its extension is proposed next to existing industries, to promote agro based industries, local production and its associated market. The small scale industries will include flour mills, rice husking mills, ice factories, packaging of fruits and vegetables, feeder crops, handicrafts, souvenirs etc.

- **Industrial Area Extension**
  Considering the location of Sugar Mill, it is recommended to first develop its nearby area for industrial development. Since the potential of large scale industries also present in this town, not only agriculture related industries. These industries may include cotton ginning factories, fiber factories and chemical factories. Since Badin District has a wealth of oil and gas reserves, thus it is recommended to develop oil and gas related heavy industries but not inside and nearby town area.

- **New Industrial Area (Reserved)**
  The New Industrial Area is proposed along Kadhan Road, next to Technical Services Area. It is highly recommended to first filled the existing industrial areas, then explore this reserved area according to the economic need of the town. This is more appropriate to develop small to medium scale industries, and avoid further development of heavy industries to keep the city environment clean. It is not suggested to develop whole area at once, instead as per the need. Preferably starting from the road accessible side and keeping further area reserved for future use when firstly developed area utilized.

The following guidelines are for industrial zone development:

Permitted Uses	Allied Permissible Uses
- Small, Medium and Large Scale Industries - Processing Units - Manufacturing Activities - Warehouses or Godowns - Workshops	- Showrooms - Mixed-used buildings - Residences for workers - Fueling stations
Applicable SBCA Bylaws[13]	**Prohibited Uses**
- Plot Sizes: ○ Small size: upto 0.5 acres ○ Medium size: 0.5 to 5 acres ○ Large size: 5 acres or above - FP: 60% - 70% - FAR: 1:2.5 - 1:1.5 - Floors: G+1 & G+2 (max)	- Private Residential housing schemes - Large health and educational institution

[13] Industrial Areas, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.6, page no 145.

4.6.6 Health and Welfare Zone

This zone is specifically for health and welfare related large scale activities. It will be a specialized area with high tech health facilities, social welfare and supporting services; with advance infrastructure. The aim will be to provide all specialized health solution within the town, and to serve the population beyond city borders, like nearby urban and rural localities.

The Level II secondary zoning of health and welfare land use will be as follow:

- **Health and Welfare Zone North (DHQ Extension)**
  Since DHQ Hospital is already constructed at Sujawal Road, along this it is suggested to have further extension of DHQ Hospital with Medical and Nursing Colleges, staff residence, hostels, community and allied facilities.

- **Health and Welfare Zone South**
  Another large health and welfare zone is proposed along New Canal Road next to Tourism Area. This health area is marked in regards to connectivity, in order to make it accessible for other towns as well and to attract private investment in health and welfare sector.

  It is widely possible that most of this area will be utilized for distinct health and welfare facilities in long term phase; like specialized hospitals, research and welfare centers etc. These could also include; Rehabilitation Centers, Special children, Edhi Homes (orphanage / old age / women) etc. These will also comprises of the specialized units like oncology, urology, infertility centers, organ transplantation, and specialized treatment centers, research and development centers.

- **Civil Hospital Extension**
  In existing Badin Town, the extension of Civil Hospital is proposed. This extension will increase the bed ratio and will also enhance the number of departments and facilities. In this way residents of Badin Town can easily access the public hospital within their vicinity.

  The following guidelines are for health and welfare zone development:

Permitted Uses	Allied Permissible Uses
- Large Hospitals - Specialized treatment centers - Medical College - Dental College - Pharmaceutical College - Nursing College - Laboratories and Diagnostic Centers - Blood Banks - Health Research Institutes	- Staff Residences (medical and paramedic) - Separate Hostels for Boys and Girls - Auditoriums, seminar halls, workshop spaces - Community facilities (parks, playgrounds, schools, clinic, neighborhood commercial) - Support facilities (gym, health club, bus stops, taxi stand, banks, fueling stations)

Applicable SBCA Bylaws[14]	Prohibited Uses
- Plot Sizes: 1.0 acre or above - FP: 50% - FAR: 1:1.5 - Floors: G+2 (max)	- Private residential housing schemes - Large commercial activities

4.6.7 Educational Zone

The large scale educational land uses will be development in this zone, focusing towards the global trend of education especially for upcoming generations. The aim is to create a knowledge base hub, to provide quality education in all diversified filed, in order to upgrade the livelihood of the local as well as the regional population.

The Level II secondary zoning of educational land use will be as follow:

- **Educational Zone North**
  In northern tract along Sujawal Road, next to Health Zone, Educational Zone is proposed which will mainly for the public sector general university, which is lacking in the town. The idea is to first introduce common educational fields like languages, humanities, applied sciences, arts, commerce, social sciences etc., which could be modified further. Afterwards broad-spectrum of new ranges of education will be added according to the demand of the society, in form of wings, departments and blocks.

  In addition to academic buildings; allied facilities like administration, sports grounds, and health clubs will also be accommodated here. Since it will be the primary level university of the town, thus it will also contain large number of students, faculty and staff. This huge influx will also require residences with community facilities.

- **Educational Zone South**
  Another Educational Zone in southern tract is suggested at Sujawal Road. As the society is moving towards global dynamics, diversified fields of education will be prerequisite. These could include upcoming need of the job market like; engineering, business, management, finance, media, IT and software, etc. The purpose behind is to involve regional level youth in the education and research, in order to enhance the educational attainment level.

- **College Extension – Seerani Road**
  It is proposed to provide government degree colleges for boys and girls, separately in this area. It is suggested to accommodate all the required facilities and service like; libraries, laboratories, playgrounds, washrooms, etc. The library, data and information centers and scientific research institutes are also recommended in these areas to provide all kind of facilities for research and development in different fields.

[14] Amenity Plots, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.5, page no 145.

- **Vocational Center**

  The area for vocational center is proposed near Civil Hospital. It will cater need of under privileged youth for better skills and technical knowledge. This will provide space for skill development centers, technical education for the local and surrounding population to accommodate in the current job market. It may also include; poly technical college for boys and girls, women development center (working women hostels, day care centers), certified computer and IT training centers, research centers, etc.

  The following guidelines are for educational zone development:

Permitted Uses	Allied Permissible Uses
- Large scale educational areas - General Education Universities - Scientific Research Institutes - Engineering colleges / universities - Business and management schools - Finance and accountancy Institutes - IT and media Institutes - City level libraries, book banks, data and information centers	- Staff Residences (teaching and non-teaching) - Separate Hostels for Boys and Girls - Auditoriums, seminar halls, workshop spaces - Community facilities (parks, playgrounds, clinics, schools, neighborhood commercial) - Support facilities (gym, health club, bus stops, taxi stand, banks, fueling stations)
Applicable SBCA Bylaws[15]	**Prohibited Uses**
- Plot Sizes: 1.0 acre or above - FP: 50% - FAR: 1:1.5 - Floors: G+2 (max)	- Private residential housing schemes - Large commercial activities

[15] Ibid

4.6.8 Religious Zone

In the proposed master plan two religious sites are allocated in the Badin Town. One is with New CBD and opposite to New Public Administration Area at Sujawal Road and second is located at Kadhan Road. These are not necessarily to be developed soon, as presently there are sufficient religious places. These will be grand religious monumental buildings and structures, to enhance aesthetic of the town. Further it is suggested to fulfill the future requirement of different religious groups in sub divisions of other areas.

The following guidelines are for religious zone development:

Permitted Uses	Allied Permissible Uses
- Religious buildings like mosques, imam barghahs, mandir, churches, etc. - Religious teaching areas - Religious preaching grounds - Orphanage	- Residences for religious leaders - Accommodation for religious scholars, students - Small parks, playgrounds, clinics, commercial - Support facilities (bus stops, taxi stand, banks, fueling stations)
Applicable SBCA Bylaws[16][17]	**Prohibited Uses**
- Plot Sizes: 1.0 acre or above - FP: 50% - FAR: 1:1.5 - Floors: G+2 (max)	- Private residential housing schemes - Large commercial activities

4.6.9 Public Administration Zone

The public administration offices will includes District Secretariat, Development Authority, Town Committee Offices, Line Departments, Local Government Offices, Town Planning Department, Judiciary Complex, Circuit House etc.

The Level II secondary zoning of public administration land use will be as follow:

- **New Public Administration Area**
  The existing offices of Public Administration are mostly along Sujawal and Hyderabad Roads. Considering future requirements, the new public administration area is also marked at Sujawal Road, opposite to the New CBD, also accessible from New Canal Road.

[16] Ibid

[17] Religious Buildings, Plots, Zoning Regulations / Area Standards, as per Sindh Building & Town Planning Regulations, Chapter 25.13, page no 156.

As Badin is a district headquarter, in future with the rising activities more space for different public offices and institutions will be required. With this assumption future extension area for public administration need to be reserved.

The area for public employee housing is also suggested here to cater the need of housing for public employees. This will include houses and walkable apartments for all employees, according to their grade levels and status.

- **District Jail**

  The District Jail is existing along Tando Bago Road in extreme east side of the town. Its further extension is proposed adjacent and behind the existing facility. This will serve the purpose of District Jail with all required needs and will also fulfill the residential requirement of the staff of various levels.

The following guidelines are for public administration zone development:

Permitted Uses	Allied Permissible Uses
- District Secretariat, - Development Authority - Town Committee Complex - Line Departments - Local Government Offices - Town Planning Department - Judiciary Complex - Circuit House	- Employees Residences (for all grades) - Auditoriums, seminar halls, workshop spaces - Community facilities (parks, playgrounds, clinics, schools, neighborhood commercial) - Support facilities (gym, health club, bus stops, taxi stand, banks, fueling stations)
Applicable SBCA Bylaws[18]	**Prohibited Uses**
- Plot Sizes: 1.0 acre or above - FP: 50% - FAR: 1:1.5 - Floors: G+2 (max)	- Private residential housing schemes - Large commercial activities

4.6.10 Recreational Zone

In the existing towns, disappearance of open spaces and non-provision of planned open spaces are seen. Thus, in the proposed master plan, recreational land use has been given a vital importance in order to create a healthy environment. Several types of regional level recreational activities are recommended like sports and cultural complex, amusement and theme parks, festival grounds etc.

[18] Ibid

The Level II secondary zoning of recreational land use will be as follow:

- **Central Park**
  Adjacent to Tourism Area and New CBD, a large Central Park is proposed in the town along Sujawal Road. This will be a general public park, however its sub portions could be reserved for families (ladies and children). Thus it will also contain area for swings, sitting, walking, jogging with allied facilities of washrooms, tuck shops, parking etc.

- **Sports and Cultural Complexes**
  Along Hyderabad Road after crossing Northern Bypass, Sports and Cultural Complexes are proposed on either sides of the road in north direction. It will include cricket, football, hockey and other ground, cultural center and gymnasium. These type of sports facilities will be as per standards to promote domestic sports.

- **Festival Grounds**
  Along Tando Bago Road and at outer side of Northern Bypass an area is located for the purpose of Festival Grounds. Considering the local tradition and types of festivals, a large space is designated for such events. These grounds will be used for large population events like carnivals, eid festivals.

- **Amusement Park**
  The site for amusement park is proposed in west direction along Sujawal Road, outside the Northern Bypass. In this area large scale amusement facilities like thrilling rides in a safe and pleasant manner will be provided. Some of its area could be reserved for other recreational activities of theme parks like art park, Ice Park, floral garden, glow garden etc. could also be introduced as per the demand of the region. Moreover, Badin is a regional center there is also need to locate botanical and zoological gardens. These gardens will serve not only a metropolis of future but urban and rural areas of Badin region as well.

The following guidelines are for recreational zone development:

Permitted Uses	Allied Permissible Uses	Prohibited Uses
- City scale parks - Large public squares - Sports facilities - Cultural activities - Amusement area - Special theme parks - Regional level gardens like botanical, zoological	- Ancillary structures - Accommodation for caretakers / workers - Related commercial activities - Fueling stations - Parking - Public washrooms	- Other than permitted and permissible

4.6.11 Graveyards Zone

At present there are number of graveyards in the town, which have sufficient space available for immediate need. However, for long term there are two graveyards proposed, one in extreme east direction along Northern Bypass and other in south of the town along Seerani Road. These graveyards can be further divided according to the requirement of practicing religions in the town.

The following guidelines are for graveyard zone development:

Permitted Uses	Allied Permissible Uses	Prohibited Uses
- Graveyard area	- Related commercial activities - Accommodation for caretaker	- Other than permitted and permissible

4.6.12 Transportation Zone

As railway operation is limited and airport is nonfunctional in Badin Town, thus the transportation is mainly based on road network of radial roads, bypasses with terminals and intersections. Road network is considered as a vehicle for economic development and social change. Efficient road network not only develops a quick and efficient transportation system but also opens up new areas previously remained closed. It brings about social integration among rural and urban sectors and greatly assists in providing access to basic amenities such as education, health facilities, etc. It brings rural areas in constant touch with urban segment of a society and creates better understanding necessary for social change and economic activities.

The Level II secondary zoning of transportation land use will be as follow:

- **Proposed Road Network**
  The proposed road network is originate from the existing radial roads i.e. Hyderabad, Sujawal, Tando Bago, Seerani, Kadhan and Canal Roads. And the major regional connecting is developed through Northern and Southern Bypasses. However with widening and beatification Sujawal and Tando Bago are forming horizontal link in west and east direction; while proposed New Canal Road is making vertical link between north and south.

  All proposed Major Roads (primary, secondary and tertiary roads) of the master plan will be dual carriageways with green medians in the center; as shown:

S. No.	Major Roads	ROW (ft)	Forestation (ft)
i.	Northern Bypass (Badin-Naukot Road)	200	200
ii.	Southern Bypass (new)	200	200
iii.	New Canal Road (Vertical Link)	150	100
iv.	Sujawal Road (Horizontal Link)	150	100
v.	Tando Bago Road (Horizontal Link)	150	100
vi.	Hyderabad Road	150	100
vii.	Seerani Road	150	100
viii.	Kadhan Road	100	50
ix.	Canal Road	100	50
ROW – property to property distance Forestation on both side of ROW			

Primary Roads: The proposed Northern and Southern Bypasses running on the periphery of the town are considered as Primary Roads. Its different segments are serving as bypasses without entering in the town. It will have a right of way of 200 feet (min) with initially a four-lane divided road, service road, median, parking, and cycle/pedestrian track and local tree plantation on both sides. In addition to the 200 feet ROW, urban forestation of 200 feet on both side are also proposed, to avoid direct / upfront development along primary roads. All primary roads crossings will be initially roundabouts with enough space for grade separated junctions in the future.

Secondary Roads: The secondary roads, are radial roads connecting the town with other towns and vertical and horizontal links connecting bypasses. It will have a right of way of 150 feet (min) with three lanes, service road, median, footpaths, parking and cycle/pedestrian tracks. These roads includes; New Canal Road, Sujawal Road, Tando Bago Road, Hyderabad Road and Seerani Road.

Tertiary Roads: The tertiary roads will have a right of way of 100 feet (min) with at least two lanes, median, footpaths, parking and cycle/pedestrian tracks. These roads includes; existing Canal Road and Kadhan Road.

- **Public Transport Terminal**

  The Public Transport Terminal is placed along Hyderabad Road in north side of the town, also accessible from Northern Bypass. It is proposed in order to provide better and nearby multi intermodal transport connectivity. Since major regional communication of general public is expected via these major roads; as most of residential, educational and health related traffic will be generated and these will cover most of the town. These will be comprises of the parking for public buses, hiace, wagons, taxis; with allied facilities like ticking booths, sitting / waiting areas, washrooms, shops and required residence for the drivers and staff.

- **Truck Terminals**

  There are two Truck Terminals proposed in the Badin Town. Considering location of industrial activities, one is placed towards south along Kadhan Road, also accessible from Southern Bypass. Another is located at Tando Bago Road near trade and commerce and warehouses, also accessible from Northern Bypass. Since from this point all industrial and economic activities are connected, it is found more appropriate location for heavy traffic and goods transport. The proposed terminal will help in transporting goods from / into the town, which will benefit and boost the economic activities of the town.

  Since Badin is an agro-trading regional center and it would also require containers facility. It is recommended to mainly comprise of the container yards and related functional spaces. In addition required residence for the drivers and other staff with small offices, rest areas, washrooms, shops etc.

- **Railway Reserved Area**

  The town has an old Railway Station, which was established during British time. The railway station lies in the northeastern part of the town. This railway line links Badin with Hyderabad, though its operation is limited.

  However, it is suggested to reserve the area for railway use only, to avoid any sort of encroachments. Consequently, the available vacant land parcels have been marked as Railway Reserved Area, in order to avoid further violation of railway ROW. Further it is recommended to improve the railway service for better cost effective connectivity for the town's economy.

- **Air Connectivity**

  Regarding air connectivity, Badin is connected to Hyderabad Airport at a distance of 110 kilometers via Badin-Hyderabad Road. Although an airstrip is located near Talhar Town, at a distance of 28 kilometers towards north via Badin-Hyderabad Road. This airstrip is not functional for regular passenger flights.

  Therefore, it is suggested that residents of Badin Town should utilize Hyderabad Airport until Talhar Airstrip will be upgraded as full fledge airport. Thus a new airport for Badin Town is not feasible due to nearby airport facilities and with projected population.

  The following guidelines are for transport zone development:

Permitted Uses	Allied Permissible Uses
- All types of parking areas - Designated ROW - Green belts - Footpaths - Traffic management devices	- Drivers and staff accommodation - Support offices, rest areas, washrooms, shops etc. - Street furniture like lights, trash bins, benches etc.

Applicable SBCA Bylaws[19]	Prohibited Uses
- No direct access to major roads will be allowed except through service road - No structure or part of a structure may project beyond building line	- Any kind of encroachment

4.6.13 Utilities and Services Zone

The utilities and services provision is also made in the master plan. This land provision is mainly for large scale utilities and services.

The Level II secondary zoning of utilities and services land use will be as follow:

- **Water Supply**
  The main water supply sources is Qazi Wal Canal and existing water supply works is suggested to expand. In continuation towards northeast, an additional area along canal is proposed for water supply works. This additional area has been reserved to extend the water reservoirs as per the town's water demand and related water supply infrastructure. This increase will also cater to water supply filtration plant and other advance purification mechanism.
- **Sewage Treatment Plant**
  The area is designated for STP and its related uses, in south direction accessible from Seerani Road and Southern Bypass. The site is low in elevation level with respect to nearby main drain, which will helpful to relay mainly on gravity flow. From very first it is not necessary to setup a fully mechanized STP, but it is suggested to start with oxidation ponds then proceed toward advance management of waste water.
- **Landfill Site**
  A landfill site is proposed at outskirts of town area, in south side considering wind direction. This landfill site is directly accessible from Kadhan Road as well as from Southern Bypass. As the whole town will grow according to the master plan it will serve the population for next 20 years or even beyond.
- **Grid Station**
  Grid station in Badin Town is existing along Hyderabad Road. For immediate need it is possible to extend the facility in the same premises. The extended facility will benefit the residents as per the need of the present consumption of the town. However the Grid Station Extension is proposed for upcoming future load and requirement behind the existing Grid Station.

[19] Highway Major Roads, General Standards, as per Sindh Building & Town Planning Regulations, Chapter 21, page no 126.

The following guidelines are for utilities and services zone development:

Permitted Uses	Allied Permissible Uses	Prohibited Uses
- Land use for Utilities and Services like Water Supply, Filtration, Oxidation Ponds, Sewage Treatment, Landfill Sites, Grid Station etc.	- Related land development and building activities - Accommodation for staff, operators and labors. - Specific parking area.	- Other than permitted and permissible

4.6.14 **Urban Forestation Zone**

Urban forestation along both bypasses and major roads is proposed to avoid rapidly increasing disorganized private development. Instead planned residential areas as per building control rules and regulations which are proposed on both sides of road after urban forestation reserved areas.

In order to protect Northern and Southern Bypasses from uncontrolled development, urban forestation of two hundred feet at both sides of the road should be planted. It is advised to restrict development in this area and implement the rules and regulations to keep the town green. In addition to bypasses urban forestation of 50 to 100 feet on both side of the major roads and vertical and horizontal linkages are also proposed depending upon their ROW, to avoid direct / upfront development along roads. All major roads crossings will have initially green roundabouts with enough space for grade separated junctions in the future.

It is recommended to plant locally available species for urban forestation. This region is gifted with a large variety of natural vegetation of grasses, shrubs and trees.

The following guidelines are for urban forestation zone development:

Permitted Uses	Allied Permissible Uses
- Land use for horticulture, landscaping, plantation, green belt, forestation.	- Related land use and activities, while no land development or buildings. - Temporary accommodation for labor and security persons. - Specific parking area for any accident and unplanned incident.

4.6.15 Agricultural Zone

In order to limit the town development agricultural reserved areas are proposed along Northern and Southern Bypasses. In this manner not only town spatial growth will be confined but also essence of agriculture activities will remain close to the town. It will also create a healthy environment and less burden will be on spread of infrastructure network. The existing villages or settlements in the periphery of the town will also be benefited and not removed from their place of livelihood. The recommended crops for production are; rice, sugarcane, wheat, cotton, jowar, maize, bajra, barley and sunflower. Due to its soil and topography, Badin is an ideal place for Rice Production.

The following guidelines are for agriculture zone development:

Permitted Uses	Allied Permissible Uses
- Land use for proposed agricultural and its necessities.	- Related land activities with respect to its rules and regulations. - Accommodation for farmers and labor in associations with MC.

4.6.16 Water Bodies

In Badin, the main water source is Qazi Wah Canal and its branches. So it is suggested that Qazi Wal Canal's beautification is highly recommended. It includes:

- Protection of its right of way and removal of encroachments
- Control on incompatible development in its surrounding
- Restriction on disposal of waste water
- Restriction on dumping of solid waste
- Provision of roads on both sides of its course
- Native plantation on both sides of its course

The following guidelines are for Water Bodies zone development:

Permitted Uses	Allied Permissible Uses
- Land use for water bodies like rivers, tributaries, canals, water channels, irrigation network, ponds, lakes, water courses.	- Related land use and activities, while no land development or buildings. - Temporary accommodation for labor and security persons.

4.6.17 **Vacant Zone**

The objective of providing vacant area is to cater the emergency need at time of any disaster. With this respect areas outside the main town will kept reserved for emergency need, which could be utilized for portable homes, mobile health care facilities, camping for vulnerable of calamities, temporary storage of bulk material etc. The proposed vacant area is at outskirts of Badin Town but being on the peripheral area, would not disturb the town activities in general and it is directly accessible from Canal Road and Northern Bypass.

However, the control on vacant land is extremely important, leap-frog development create pressure to utilize for other uses. Thus, there is a need to make sure that no development would take place in these types of reserved areas.

The following guidelines are for vacant zone development:

Permitted Uses	Allied Permissible Uses
Land use for proposed emergency and imminent necessities	Related land development and building activities. Temporary accommodation for operation and maintenance staff in associations with MC.

SECTOR WISE PROPOSED STRATEGIES

5. HOUSING

Adequate housing is fundamental to improve living standards among poor and low-income households because it is one of the major components of the social infrastructure, the lack of which begins to offset the positive effects of economic development. Without adequate shelter, families are condemned to poverty, poor health, low educational attainment, vulnerable to natural disasters and the chaos of civil conflict. Lack of safe, affordable, decent housing is a major contributor to poverty and affects all aspects of a family and community's life.

5.1 Existing Situation

According to a sample socio-economic survey conducted in Badin town, the society is comprises of 38% joint family and 62% nuclear family system. 66% of the houses were below 120sq.yd where 31% of the houses have only two rooms or less.

The status of ownership of houses is 85% family owned, 4% rent free and 11% on rent. The rent paid for the 63% of rented houses is below Rs.5,000/- while 31% pay between Rs.5,000/- to 10,000/- and remaining 6% pay above Rs.10,000/- monthly**.** It shows that we have need of low income housing.

The sample survey also revealed that only 39% of the houses have drained toilet (flush system) in their houses while 61% of the houses have un-drained toilets or dry toilet which requires manual cleaning. The piped water supply connection (with or without water supply) is available to 90% of the respondents, while rest of the houses use ground water by manual hand pumps. Type of drains, show 87% of the drains are open and only 1% of the households have covered drains.

5.2 Katchi Abadis

In urban areas, the problem manifests as unstoppable growth of squatter settlements known as katchi abadis and encroachment of state and private land. It is estimated that 50% of the urban population now lives in katchi abadis and informal settlements.

5.3 Katchi Abadis of Badin DHQ Town

According to data provided by Sindh Kacthi Abadis Authority (SKAA), that eighteen sites are identified as Katchi Abadis in Badin DHQ Town, namely; Bagh Mohallah Colony, Chandia Village, Irrigation Colony, Jamali Village, Khaskheli Village, Leghari Village, Lonanai Village, Masan Amoon Mohallah, Mazdoor Colony, Mirwah Badha, Oad Mohallah, Old Mirwah Bhada, Pir Ali Shah Jo Kot, Qazi Mohallah, Shahbaz Colony, Shaheed Fazil Rahu, Sweeper Colony I & Ii and Turak Mohallah. Out of total only Shahbaz Colony is un-notified. These eighteen sites are covering an area of 194.18 acres with 2,571 housing units (approx. 12,855 population). It is estimated that 11.43% population of Badin MC resides in katchi abadis.

List of Katchi Abadis in Badin DHQ Town				
S. No.	**Name of Katchi Abadi**	**Total Area in Acres**	**No. of Housing Units**	**Estimated Population**
1.	Bagh Mohallah Colony	3.30	75	83
2.	Chandia Village	4.00	130	275
3.	Irrigation Colony	7.87	80	240
4.	Jamali Village	14.14	108	130
5.	Khaskheli Village	10.00	250	300
6.	Leghari Village	17.53	125	825
7.	Lonanai Village	5.20	70	83
8.	Masan Amoon Mohallah	4.30	75	108
9.	Mazdoor Colony	53.00	330	525
10.	Mirwah Badha	8.00	120	206
11.	Oad Mohallah	2.25	120	625
12.	Old Mirwah Bhada	14.50	105	125
13.	Pir Ali Shah Jo Kot	24.78	158	225
14.	Qazi Mohallah	1.50	50	300
15.	Shahbaz Colony	2.00	50	60
16.	Shaheed Fazil Rahu	14.25	470	2925
17.	Sweeper Colony I & Ii	1.28	125	750
18.	Turak Mohallah	6.28	130	175
Total		**194.18**	**2,571**	**7,960**

5.4 Available Housing Stock

As per 2017 Census results, Badin MC has household size of 5.0 persons and a total housing stock of 22,380. Socio-economic survey conducted by Consultants also reveals that majority of the households consist of 5 to 6 members.

Table 5-1: Housing Statistics

ADMINISTRATION UNIT	Census 2017			
	Population	**AGR**	**No. of HH**	**HH Size**
Badin MC	112,420	3.11%	22,380	5.0
Badin Taluka	455,295	1.31%	91,998	4.9
Badin District	1,804,516	2.47%	359,376	5.0

Shaheed Mohtarma Benazir Bhutto Township (SMBBT)

Government of Sindh included the scheme under Special Initiative Unit in its Annual Development Plan 2011-12 i.e. "Development of Townships in Major Urban Centers (50,000 Nos.) 120-Sqyds plots with all Civic Services" under President's Directives.

The site of SMBBT in Badin is located along serani road. The site has been fully developed with 419 plots ready for allotments to poorest of society.

5.5 Issues:

The following are the major issues in the housing sector:

- The households below poverty line have remained neglected, in all housing policies.
- Inadequate supply of developed land and its skyrocketing prices are making housing ownership beyond the affordability limits of the majority of population.
- Housing and associated infrastructure is in dilapidated condition requiring improvement / replacement
- Unchecked growth of squatter settlements
- Shortage of finance continues to be the major constraint in housing production, maintenance and growth.

5.6 SWOT Analysis

HOUSING			
1. The trend of new housing schemes construction by private development is increasing 2. Most of the formal neighborhoods are served by electric and gas supply	1. 30% of the urban population lives in katcha houses with low quality of life and limited utilities and services 2. Shortage of land 3. High prices of houses 4. The informal housing sector lacks provision of utility and services like gas, water and drainage	1. Demand for new planned housing schemes 2. Demand for low income housing 3. Demand for public sector housing projects 4. Opportunity of micro financing for housing	1. Homelessness. 2. Haphazard growth of informal housing in vacant spaces available within town 3. Increase of urban sprawl in outskirts of the town 4. Inflation in land prices due to shortage of land in core area 5. Shortage of open spaces in core areas

5.7 Need Assessment

Based on the projected population for the year 2037, the increase in population is 95,004 with an estimated additional housing requirement of 18,686.

Table 5-2 : Projected Housing Need 2037 (Badin MC)			
S. No.	**Housing**	**Population**	**No. of HH**
1.	**Present 2017**	112,420	22,380
2.	**Shaheed Mohtarma Benazir Bhutto Township Badin (SMBBT)**		419
3.	**Future 2037**	207,424	41,485
4.	**Additional (2017-2037)**	95,004	18,686
Source: Consultants Estimate 2017and Census Report of Badin			

In urban areas, the problem manifests as unstoppable growth of squatter settlements known as katchi-abadis and encroachment of state and private land. It is estimated that 50% of the urban population now lives in katchi abadis and slums[20].

5.8 Policy Guidelines

Housing sector is divided in various sub sectors. Policy guidelines for all sub sectors are given below:

i. ***Policy Measures for Land***[21]

- Priority Identification of Land for Housing
  As an immediate measure, the provincial, municipal, metropolitan and local authorities under the plan shall identify parcels of state and other lands for housing development in the urban and rural settlements in their respective jurisdictions
- Land Acquisition
  The procedural and legal bottlenecks in the acquisitions process shall be removed and land acquisition laws shall be suitably amended to make provision for unified, transparent and market value oriented systems and procedures which would also minimize litigation.
- Land Information System
  Development of a comprehensive land information system using modern technology to record correct and up to date information regarding inventory and land classification, settlement patterns, land values and land availability on all land in urban and rural areas, shall be made a mandatory requirement at all levels of governance.
- Land Registration and Tenure System
  The informal and customary tenure systems shall be rationalized into a formal and registered social contract.

[20] http://www.sindh.gov.pk/dpt/phc/policy.html
[21] National Housing Policy 2001

ii. Policy Measures for Housing Finance[22]

- Financial Institutions shall be encouraged to give mortgage loans for housing purposes at market rates.
- Housing finance institutions shall be encouraged to promote savings and provide micro loans for low income group through community organization, NGOs and CBOs.
- Part of the sale proceeds of valuable public land shall be set aside to subsidize low income housing and housing for the poor and needy.
- The micro financing should also be available for repairs renovation and extension of existing houses.
- Subsidized loaning facilities shall be extended for rural housing construction and improvements through micro-financing system and institutions like Khushhali Bank, Zakat funds, etc.
- Mark-up on Housing loan installment for individuals shall be treated as expense in tax return.

iii. Policy Measures for Katchi Abadis, Squatter Settlements & Slums[23]

- The process of regularization and up-gradation of the pre-1985 Katchi Abadis shall continue as per current policy. However, Katchi Abadis, which are hazardous by virtue of being close to railways tracks or located under high tension power lines, or are on or close to the riverbeds, or on lands needed for operational /security purposes, need to be relocated at appropriate places by LOAs.
- Formation of new Katchi Abadis shall not be allowed and shall be discouraged by exercising strict development controls in all urban areas.
- In all government housing schemes, adequate plots for low income people shall be reserved to offer them at affordable prices. In addition private developers will also be encouraged to develop low cost housing schemes.
- City and District Government shall prepare housing plans to cater for the current and future housing needs for low income groups on incremental basis at affordable, cost. Katchi Abadis resettlement plans and up-gradation plans shall be an integral part of these housing plans.
- Building regulations, building by-laws, and planning standards shall be revised to permit incremental development and lowering of planning standards to make it cost effective for low income groups.

[22] Ibid

[23] Ibid

5.9 Strategic Development Plan

The aim of this Strategic development Plan is to facilitate all for the provision of housing; especially to poor and deprived population in the town. In this regard following strategies need to be focused:

i. Long Term Plan

- Identification and acquisition of 1,500 acres of land for providing the housing gap of 19,800, in Badin MC, until 2037.
- Fulfill the need of small house units (120 sq. yard) for catering the demand of increasing one unit lifestyle
- An affordable housing program for low income group in different phases up to 2037, through one window operation (including technical guidance, easy loan provisions, legal procedures)
- Formulation of Green Building Byelaws for future housing to address water conservation, low energy consumption, waste recycling etc.
- Low-income Housing Funds would be established to provide sufficient and affordable credit for housing to meet the needs of shelter less poor. Example is Grameen Bank which is a microfinance organization and community development bank founded in Bangladesh. It makes small loans to the impoverished without requiring collateral
- Legal and regulatory framework to be followed in order to facilitate the housing development for all income group.

ii. Short Term Plan

- Incremental housing schemes on the lines of Orangi, Qasba, and Khuda Ki Basti etc. should be initiated based on lessons of experience.
- One stop facilitation center should be established to facilitate public, especially for unprivileged and poor households.
- Provision of incentives through tax rationalization, reduction in property tax and registration, simplification of procedure and enforcement of effective foreclosure laws.
- Development of indigenous and cost effective approaches particularly for low income group and mass production.
- Land bank to be formed to facilitate availability of suitable, affordable, safe and secure land parcels within the town for the development of housing schemes.
- Regularize notified Katchi Abadis complemented by policies to restrain the emergence of new Katchi Abadis.
- A portion of "Corporate Social Responsibility" Funds may be earmarked for micro-finance for employee housing loans.
- Increase in proportion of small size plots could be made for low income groups in all new housing schemes.
- Discourage speculation in land prices through better land management practices like Non Utilization Fee etc.

5.10 Priority Projects

Due to high levels of poverty, houses in Badin are not built in response to climate/weather. There is a diurnal variation of temperature. Thus, housing must be looked into, to prevent illnesses caused by extreme weather. The solution is to reconstruct the existing houses and to construct the new ones for a significant number of households which have low income. These households are unable to acquire their own houses so resolve their housing problem on their own resulting in the expansion of slum areas and encroachments. The living condition in such areas is poor, they face so many problems and mostly don't have utility services. To resolve the problems occurred due to this situation, the public sector in Badin should launch proactive strategy for urbanization.

i. Development of Housing Site with allied services for Low Income People and land acquisition

- **Project Justification**

Significant households in Badin have low income. These households are unable to acquire their own houses to resolve their housing problem resulting in increase in the number of slums areas and encroachment. The living condition in such areas are poor they face so many problems and mostly don't have utility services.

According to the primary survey conducted in Badin town, the status of ownership of houses is about 89% family owned or rent free, whereas 11% of on rent. The category of rental indicates housing gap.

The private sector is usually very active in the development of land and construction of house but the issue is with the affordability for low income groups. The public sector will need to facilitate the private sector.

Description	Results
Present Population census 2017	**112,420**
out of total, 11% Population of Badin Town Living in rental houses with no house ownership	12,366
Households required @ 5.0	2,473
Availability of SMBBT Fully developed plots	419
Additional Plots Required to fulfill present gap	2,054

The site of SMBBT "Shaheed Mohtarma Benazir Bhutto Townships" is located along Serani road. The site has been fully developed with 419 plots ready for allotments to poorest of society.

Approx. 2,054 Number of housing units up to 120 sq. yds will be proposed. Tentative ten million cost per acres for site development and five million per acre cost for land acquisition is estimated with all allied facilities and infrastructure. The purpose of this project is to:

- Provide affordable shelters to the poor people
- Through this process alternate resettlement of the congested part of the towns may be possible
- This process will improve the living standard of the town

The housing scheme will be as per the minimum standards to reduce the cost of the project.

- **Project Benefits**
  Part of the capital expenditure is expected to be recovered through Sale of commercial plots and buildings. The project is expected to generate direct income. The project will directly give benefit to the low income people. Improve in living conditions are associated with the improvement of social and long term economic benefit.

- **Implementing Authority** – P&D Department Government of Sindh, Badin MC and HESCO etc.

- **Estimated Cost: 1,800 Million Approx**. (Short Term)

Project Name	Short Term	Proposed Area in Acres	Preliminary Cost in Million/- PKR)	Justification
Land acquisition for Development of Housing Site for Low Income Group	Short Term	120 acre	600.00	Proposed site land acquisition assumed five million per acre.
Land Development for low income housing scheme	Short Term	120 acres	1,200.00	2,054 housing units size upto 120 sq.ds. For this proposed site development we have assumed ten million per acre with internal allied facilities and infrastructure.

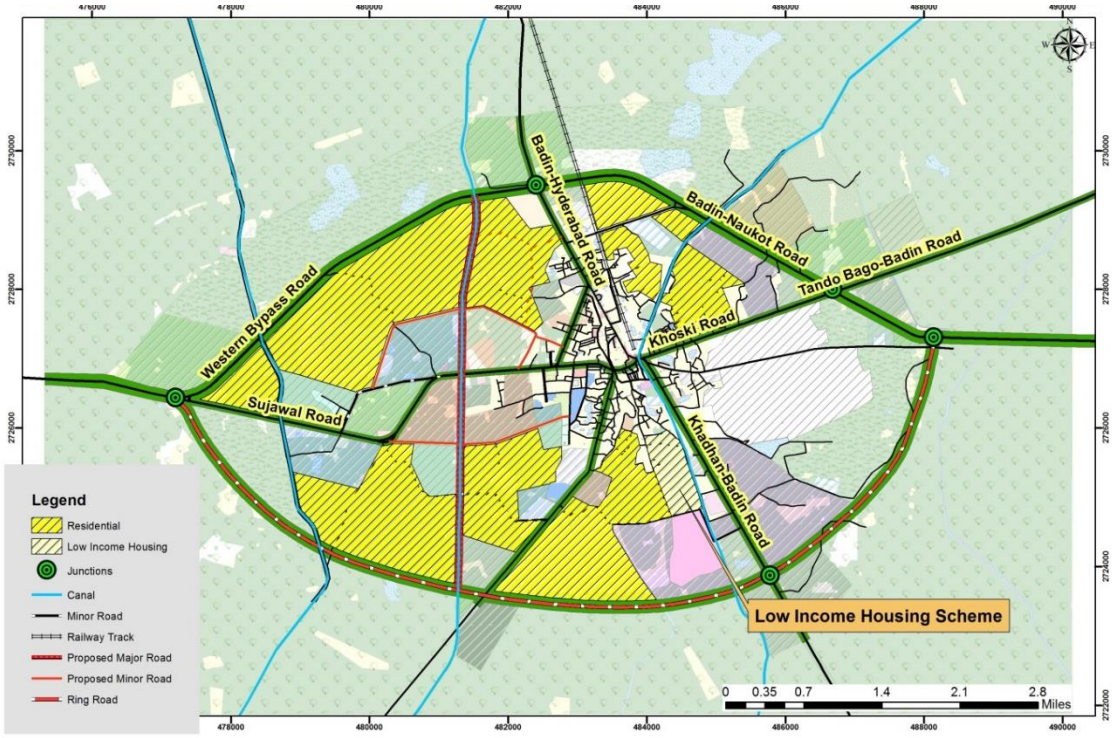


Figure 5:1: Proposal of Site Development for Low income Housing Scheme in Badin Town

6. SOCIAL INFRASTRUCTURE

6.1 Education

6.1.1 Existing Situation

In district Badin, there are 2,763 primary schools out of which 432 are for boys and 274 are for girls students. The total enrolments in these schools are 140,162 (boys 93,245 and girls 46,917) with Teaching Staff of 4,256 out of which 3,579 are male and 677 are female. The Teacher Student Ratio is 1:33.

There are 75 middle schools out of which 16 are boys and 10 are girls, with an enrolment of 6,177 Students, boys 4,010 and girls 2,167. These students are being taught by 268 Teachers. The Teacher Student ratio is 1:23.



Figure 6:1: Govt. Primary School Badin

There are 26 elementary Schools in district Badin, with a total enrolment of 4,328 (boys 2,485 and 1,843 girls) having a Teaching staff of 114 teachers. The teacher student ratio is 1:38.

The number of Secondary Schools in Badin is 60 in number out of which 9 are for boys and 11 for girls students, with a total enrolment of 32,731 (boys 22,440 and girls 10,291), taught by 1,193 teachers (male 853 and female 340).

There are 10 Higher Secondary Schools in district Badin, with an enrolment of 11,728 (boys 8,394 and girls 3,334) having Teaching Staff of about 345 out of which 225 are male and 120 are female.

Condition of Education Institutions

There is an overall poor condition of schools and college due to lack of repair and maintenance of buildings lack of playgrounds, libraries, electricity, labs, toilets, etc. To bring universal education ratio there is a need to double the efforts by engaging teachers, increasing the capacity of schools, operationalization of existing closed schools and opening of new schools

The reason for the deterioration of education in government schools in Pakistan, especially primary and secondary education, is that the standard of educational expenditure set by the UNESCO is minimum 4% of the GNP, but Pakistan during last 66 years has been spending on an average only 2% of the GNP. The state of education in Sindh is best reflected in its literacy figures and in the serious disparity between rural and urban areas. The Sindh has the largest number of ghost schools in the country and thousands ghost teachers draw government salaries. The education sector in Sindh is facing many challenges; major being very low enrolment level, rural and gender disparity, and low level of quality education. Besides, the alarming fact that there is a large number of out of school children, even those in the systems are not performing and learning outcomes are less than optimal. There are also issues of large number of closed schools and poor infrastructure in functional schools.

There is overall poor condition of schools and college due to Lack of repair and maintenance of buildings, lack of playgrounds, libraries, electricity, labs, toilets etc.

The tables below show the present statistics of educational institutions in Badin MC:

Table 6-1: Present Education Institutions and Enrolment Record

S. No.	Type	Numbers	Classrooms	Enrolments	Teachers	Students per classroom	Teacher Student Ratio
1	Govt. Girls Primary Schools (GGPS)	19	63	2120	84	34	1:25
2	Govt. Boys Primary Schools (GBPS)	56	164	6813	203	42	1:34
3	Govt. Girls High Schools (GGHS)	3	21	1299	54	62	1:24
4	Govt. Boys High Schools (GBHS)	3	31	3369	59	109	1:57
Total / Average		**81**	**279**	**13601**	**400**	**49**	**1:34**

Table 6-2: Present College and University Education Institutions and Enrolment Record

S. No.	Type	Numbers	Classrooms	Enrolments	Teachers	Students per classroom	Teacher Student Ratio
1	Govt. Islamia Degree College	1	14	3070	30	219	1:102
2	Govt. Girls Degree College	1	4	1008	22	252	1:46
3	Govt. Polytechnic Institute	1	5	584	9	117	1:65
4	Govt. Elementary College of Education	1	4	80	4	20	1:20
5	Sindh University Campus (Laar)	1	14	520	22	37	1:24
Total / Average		**5**	**41**	**5262**	**87**	**128**	**1:60**

Source: District Education Department Badin

The total 75 primary schools including boys and girls, have the following condition of services and facilites:

- 66 don't have the facility of electricity
- Washroom facility is available in 42 schools
- 29 schools possess the facility of drinking water
- 55 have play ground facility present in their vicinity

6.1.2 Issues

Identification of major issues of education sector in Badin MC:

- Shortage of class rooms as per current enrolment (The available no of classrooms are not sufficient, for current enrolment. At present 279 classrooms are available, in the existing schools and colleges, whereas shortage of classrooms amount to 174 on the basis 30 students per class Similarly in colleges and university present shortage of classroom is amounting to 91)
- Low enrolment level with gender disparity
- Shortage of teachers causing low quality of education
- Lack of provision of basic facilities i.e. washrooms, electricity, drinking water etc.
- Poor condition of schools and colleges due to lack of repair and maintenance of buildings
- In addition to classrooms, the rehabilitation of existing educational buildings with all basic and allied facilities are also required. Lack of allied facilities includes furniture, playground, laboratories, libraries etc.

6.1.3 SWOT Analysis

Education and Literacy			
Strength	**Weakness**	**Opportunity**	**Threats**
1. Urban literacy rate is higher than rural 2. 60 % of urban population is literate.	1. Trend of losing public institutes and universities 2. Less opportunities to learn modern teaching methods 3. High demand for private schooling system	1. More people will move to other urban areas for better education 2. More diversified educational institutes are required 3. PPP is required to introduce modern teaching methods in public schools 4. Good labour force available for professions	1. The children of peasants and farmers will not get education 2. Relocation of educated class to other major towns of province 3. Establishment of higher education institutes by private sector

6.1.4 Need Assessment

In future the target is to achieve 100% enrolment with 1:1 male female ratio in next twenty years. Therefore the need will be of 2,526 additional classrooms for schools and colleges, which will be required to accommodate upcoming generation in 2037, as shown in the table below. This need will be fulfilled either by addition of classrooms in the existing buildings or new buildings will be constructed in the future.

Table 6-3 : Present Need of Classrooms in MC Badin

S.No	Description	Results
In Schools of MC Badin		
1	Total present enrolments	13,601
2	Classrooms available at present	279
3	Students per classroom at present	49
4	Classrooms required for present need @ 30 students per classroom	453
5	Present shortage of classrooms	174
In Colleges and University of MC Badin		
1	Total present enrolments	5,262
2	Classrooms available at present	41
3	Students per classroom at present	128
4	Classrooms required for present need @ 40 students per classroom	132
5	Present shortage of classrooms	91
Source: District Education Department Badin and Consultant's estimates		

Table 6-4: Future Requirement of Classrooms in MC Badin

S. No.	Description	Results
In Schools of MC Badin		
1	Expected total enrolment by 2037 @ 100% enrolment	66,067
2	Total classrooms requirement in 2037	2,202
3	Additional classrooms requirement in 2037	1,749
In Colleges and University of MC Badin		
1	Expected total enrolment by 2037 @ 100% enrolment	32,721
2	Total classrooms requirement in 2037	818
3	Additional classrooms requirement in 2037	777
Source: Consultant's estimates based on population projection on 2017 census and 1998 census age pyramid		

- **Present Need Assessment in Education Sector (2017)**
- **District Badin (Includes primary to Higher education institutions)**

  - As per NRM (National Reference Manual) and NEP (National Education Policy) standards, recommended students per classroom occupancy is 30 students per classroom. Total enrolment and the available number of classrooms show that there is a shortage of class rooms.
  - The present need can be fulfilled by providing new classrooms in existing school buildings or providing new school buildings with the provision of playgrounds and other facilities.
  - Therefore, for the short term plan, the Badin district needs 1,519 extra class rooms.

Table 6-5: Present Assessment in Education Sector of Badin District

S. No	Description	Results
1.	Total Enrolment	195,126
2.	Total Number of available Class Rooms	4,975
3.	Students per Class Room @ NRM Standard	30
4.	Student Capacity per Class Room	39
5.	Class Rooms Required for present need	6,504
6.	Shortage of Class Rooms	1,519
7.	No. of Teachers	6,176
8.	Teacher Student Ratio	32
Source: *Sindh Education Profile 2016-17 and Consultant's Estimates 2017*		

Taluka Badin (Includes primary to Elementary education institutions)

- Short term plan, for taluka provision, there is a need for 253 extra classrooms. The repairing of existing buildings with all the basic facilities and training of teaching staff is required.

Table 6-6: Present Assessment in Education Sector of Badin Taluka

S. No	Present Need Assessment of Taluka Badin	Results
In Schools of Badin (Primary, Middle and Elementary)		
1.	Total Enrolment	39,523
2.	Total Number of available Class Rooms	1,064
3.	Students per Class Room @ NRM Standard	30
4.	Student Capacity per Class Room	37
5.	Class Rooms Required for present need	1,317
6.	Additional numbers of Class Rooms	253
7.	No. of Teachers	1,247
8.	Teacher Student Ratio	32
Source: *RSU (Reform Support Unit RSU Education & Literacy Department. Government Of Sindh 2017) and Consultant's Estimates 2017*		

Taluka Badin (Higher education institutions)

- The available number of classrooms for students is 302. As per the present figures provided by the district education department Badin, the occupancy rate in the present classrooms is a very high 35 students per classroom. As per National Reference Manual (NRM), 40 students per classroom is the standard for college-level education. Based on the standard occupancy of 40 students per classroom, currently, there is no need for additional classrooms.

Table 6-7: Present Need Assessment in Education Sector of Badin Taluka (Higher Secondary)

S. No	Present Need Assessment Badin Taluka	Results
In Schools of Badin (Secondary and Higher Secondary)		
1.	Total Enrolment	10,662
2.	Total Number of available Class Rooms	302
3.	Students per Class Room @ NRM Standard	40
4.	Student Capacity per Class Room	35
5.	Class Rooms Required for present need	267
6.	Additional numbers of Class Rooms	35
7.	No. of Teachers	373
8.	Teacher Student Ratio	29

Source: *RSU (Reform Support Unit RSU Education & Literacy Department. Government Of Sindh 2017) and Consultant's Estimates 2017*

6.1.5 Future Assessment (2037)

a. District Badin

i. Primary to Higher Secondary

The long term plan target is to achieve 100% enrolment with a 1:1 male-female ratio by 2037; therefore, 11,612 additional classrooms will be required to accommodate the upcoming generation for the next twenty years. This need could be fulfilled either by addition in existing buildings or more new schools and colleges will be needed to be constructed in the future to serve an additional estimated population of 2,020,335 (10 and above).

Table 6-8: Future Requirement of Classrooms in Badin District

S. No.	Description	Results
Primary to Higher Secondary		
1	Expected total enrolment by 2037 @ 100% enrolment	497,608
2	Total classrooms requirement till 2037	16,587
3	Present Supply (2017)	4,975
4	Additional classrooms requirement till 2037	11,612
Source: Consultants Estimate Based on 1998 and 2017 Census		

b. Taluka Badin

The long term plan target is to achieve 100% enrolment with a 1:1 male-female ratio in the next twenty years. Therefore, the need will be of 2,462 additional classrooms for school (Primary to Secondary), 209 additional classrooms for High Secondary will be required to accommodate the upcoming generation for the next twenty years. This need could be fulfilled either by addition in existing buildings or more new schools and colleges will need to construct in the future to serve an additional estimated population of 498,260 (10 and above).

Table 6-9: Future Requirement of Classrooms in Badin Taluka

S. No.	Description	Results
Primary to Elementary Schools		
1	Expected total enrolment by 2037 @ 100% enrolment	114,301
2	Total classrooms requirement till 2037	3,810
3	Present Supply (2017)	1,064
4	Additional classrooms requirement till 2037	2,746
Secondary to Higher Secondary Schools		
1	Expected total enrolment by 2037 @ 100% enrolment	20,429
2	Total classrooms requirement till 2037	511
3	Present Supply (2017)	302
4	Additional classrooms requirement till 2037	209
Source: Consultants Estimate Based on 1998 and 2017 Census		

6.1.6 Policy Guidelines[24]

- Development of Teachers and professional substitutes; Eliminate gender bias in curriculum development; Encourage young women and girls through opportunities and facilities for participation in sports; develop women development centers.
- Introduce farmer field trainings in rural schools to ensure that the next generation of farmers is already tuned to market intelligence and opportunities. Introduce wider farm mechanization.
- Construct required schools and higher education institutions in all districts. Take stock of operational and staffed schools and eliminate ghost schools.
- Ghost Schools and absentee teacher should be identified and removed.
- Maintenance of existing schools and depilated buildings should be given top priority.
- Badin is a flood prone district. The schools selected to act as shelter should be given top priority in repairs and utilities.
- For girl's literacy and women education, informal system of homeschool may be encouraged.

6.1.7 Strategic Development Plan

This Strategic Development Plan aims to strengthen existing schools system to bring socio-economic and sustainable development in the region. The focus of this plan is centered chiefly on improving education standard at primary and secondary levels and providing extra curriculum opportunities to address the needs of youth in rural and remote areas. This will increased the literacy ratio, living standard, employment opportunities of the future population.

Based on the above objectives some strategies are discussed below:

i. Long Term Plan

- Up gradation of LAAR Campus to LAAR University
- Medical and Engineering College along Hyderabad-Badin Road near circuit house, to cater the regional population of South Sindh
- Sustainable construction new schools and colleges with all facilities to cater additional future enrolment.
- Enhancing the equity of resource allocation and improving the fiscal sustainability and effectiveness of educational expenditure, thereby fostering transparency and accountability in the use of public resources.
- A large number of school going age children are currently out of school. The provincial government should device incentives to attract out of school children in schools.

ii. Short Term Plan

- Increasing equitable access to quality ECE, primary and secondary education, with the aim of eliminating social exclusion, enhancing transitions, promoting social cohesion and providing greater opportunities for access, participation and learning to marginalized groups, particularly girls.

[24] Sindh Vision 2030

- Improving the quality of learning outcomes through strengthening the teaching/learning process, improving the quality of teachers through merit-based selection and recruitment; improved accountability, and establishing a competency-based constructivist system of educational professional development.
- Ghost schools and absentee staff should be brought to the mainstream in collaboration with the private sector.
- Sufficient funds should be provided for rehabilitation of dilapidated school buildings

6.1.8 Priority Projects

Education Plays Very Important role to achieve goals of any urban strategy. Currently the situation of primary education structure schools is very poor. The priority projects will focus on the improvement of the infrastructure and provide the basic facilities like water, electricity, toilet, playgrounds etc.

i. Repair & Rehabilitation of schools and Colleges with allied infrastructure (Excluding IAP projects)

➢ **Project Scope & Justification**

Education should be the one of major goal of any urban strategy. The sitution of education sector in Badin is not at the preferred level. The condition of exisiting schools in DHQ town needs rehabilation and improvement of the infrastructure and Allied basic facilities like water, electricity, toilet, playgrounds etc.

At present, there are more than 40 educational building of various levels prsent in town, therefore on priority basis we have suggested below school buildings for repair and rehabilitation.The List of the schools and colleges in this project are given bellow:

S.No.	Name	Area in Acres
1.	Govt. Boys High School Badin	4.43
2.	Govt. Islamia College Badin	1.31
3.	Haji Khamiso Bhatti	1.16
4.	Government Boys & Girls School	1.15
5.	Government Boys School Haji Muhammad Khan Odhejo	0.56
6.	GBPS Barrage Colony Badin	0.57
7.	Gul Muhammad Laghari	0.68
8.	Government Primary Boys School	0.66
9.	Agrovile Colony	3.16
10.	Govt. Elementary College of Education	2.58
Total		**16.26**

- **Project Benefit**
  This relate to the basic right of the people and comes under the compulsory social services, By the increasing in the litracy ratio the living standard of the population will improve with in the district. Attempts will be made eleminate the gender gap and attracts more girls in the school.

- **Implementing Authority –** District Education Works & Services Department GoS.

- **Estimate** Cost: Rs.418.73 million approx.

ii. Capacity Building Training Programs to Enhance Capacities.

- **Project Scope & Justification**
  Sindh Teacher Education Development Authority (STEDA), Provincial Institute of Teacher Education (PITE) is providing the professional development of teachers for increasing their teaching skills. In Badin, the peoples are significantly deficit in technical skills.

- **Project Benefits**
  By implementation of this project, people will enhance their academic skills and it also strengthens their teaching skills for better results.

- **Implementing Authority -** Sindh Teacher Education Development Authority (STEDA), Provincial Institute of Teacher Education (PITE) Government of Sindh.

- **Estimated Cost:** Rs.15 Million PKR Approx.

Project Name	Area Acres	Estimated Cost In Millions	Short Term	Justification
Education				
Rehabilitation of existing school buildings along with allied facilities with basic utilities. (Excluding the IAP Projects)* considering 25% built-up area	16.26	318.73	Short Term	4.78 acres = 212,485.68 sft, at the rate of 1500/- PKR per sft construction cost with all infrastructure cost.
Capacity Building Training Programs to Enhance Capacities.	-	15.00	Short Term	Teachers Capacity building programs can also strengthen their teaching skills for better results.

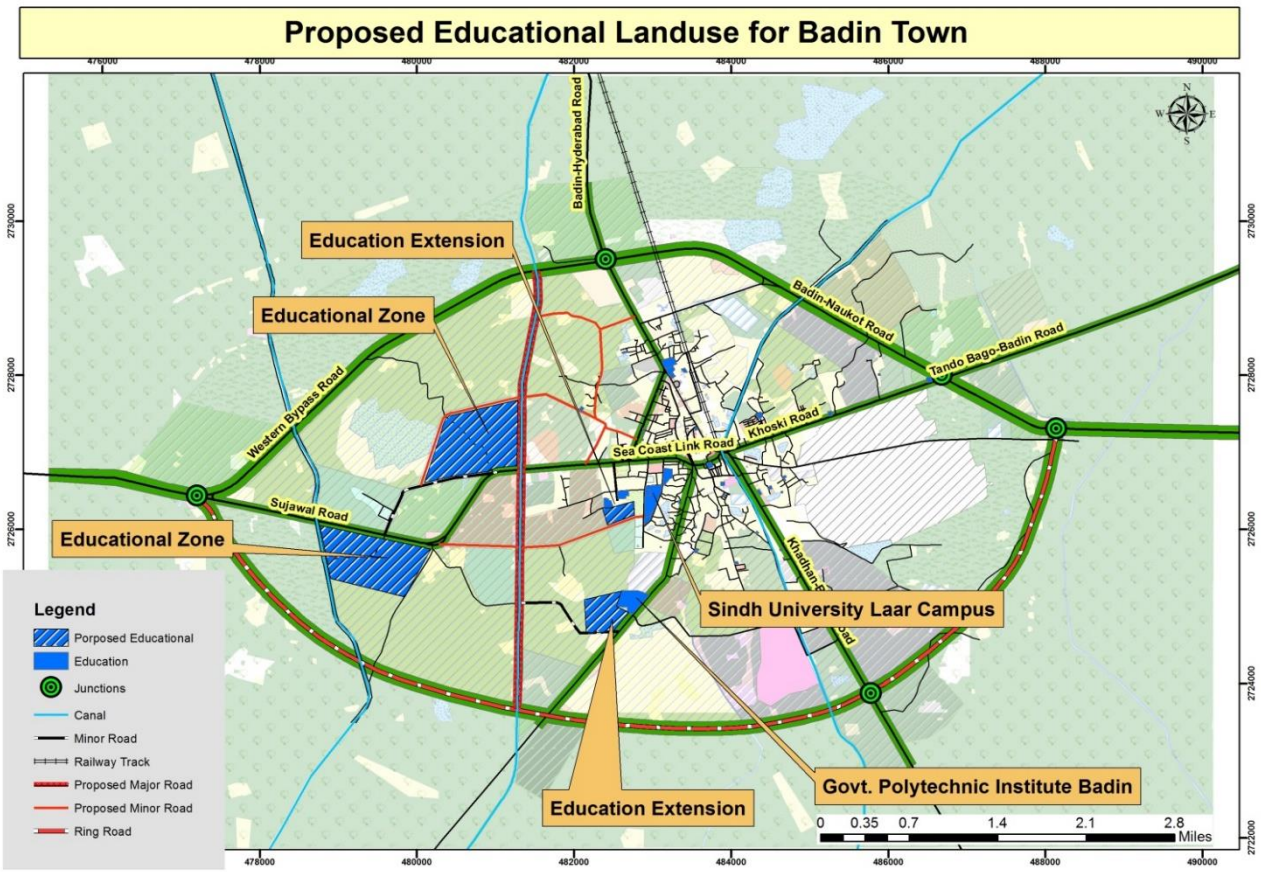


Figure 6:2: Proposal for Extension of Educational Facilities for Badin Town

6.1.9 Immediate Action Plan for Core Urban Area

i. Repair, Rehabilitation and Provision of Missing Facilities to Schools Buildings

All schools marked in core urban area should be rehabilitate with the structural stability, building repair work, access to utilities, provision of facilities, replacement of old furniture, presence of teaching and non-teaching staff etc.

Immediate plan for Badin Includes; Govt. Girls College Badin, Govt. Girls High School N0:1 Badin, Government Primary Boys School, Government Boys Primary school, Government Boys & Girls School & Government Girls Primary School.

All schools marked in core urban area should be rehabilitate with the structural stability, building repair work, access to utilities, provision of facilities, replacement of old furniture, presence of teaching and non-teaching staff etc.

S. No	Education Facility Name	Area (acre)	Rehabilitation Required - Area wise or job wise cost (PKR)							
			Street / Road / Parking	Utility Facilities					School Building Repair/ Renovation	Security
				Electricity	Water Supply	Sewerage	Gas	PTCL		
1	Govt. Girls College Badin	1.61	1.61	1.85	2.41	2.41	1.61	0.40	0.80	0.40
2	Govt. Girls High School N0:1 Badin	0.33	0.33	0.38	0.50	0.50	0.33	0.08	0.17	0.08
3	Government Primary Boys School	0.13	0.13	0.15	0.20	0.20	0.13	0.03	0.07	0.03
4	Government Boys Primary school	0.20	0.20	0.23	0.30	0.30	0.20	0.05	0.10	0.05
5	Government Boys & Girls School	1.15	1.15	1.32	1.73	1.73	1.15	0.29	0.58	0.29
	Government Girls Primary School	0.20	0.20	0.23	0.30	0.30	0.20	0.05	0.10	0.05
Total		3.62	3.62	4.16	5.42	5.42	3.62	0.90	1.81	0.90
Total PKR Rs. Million			**25.86**							

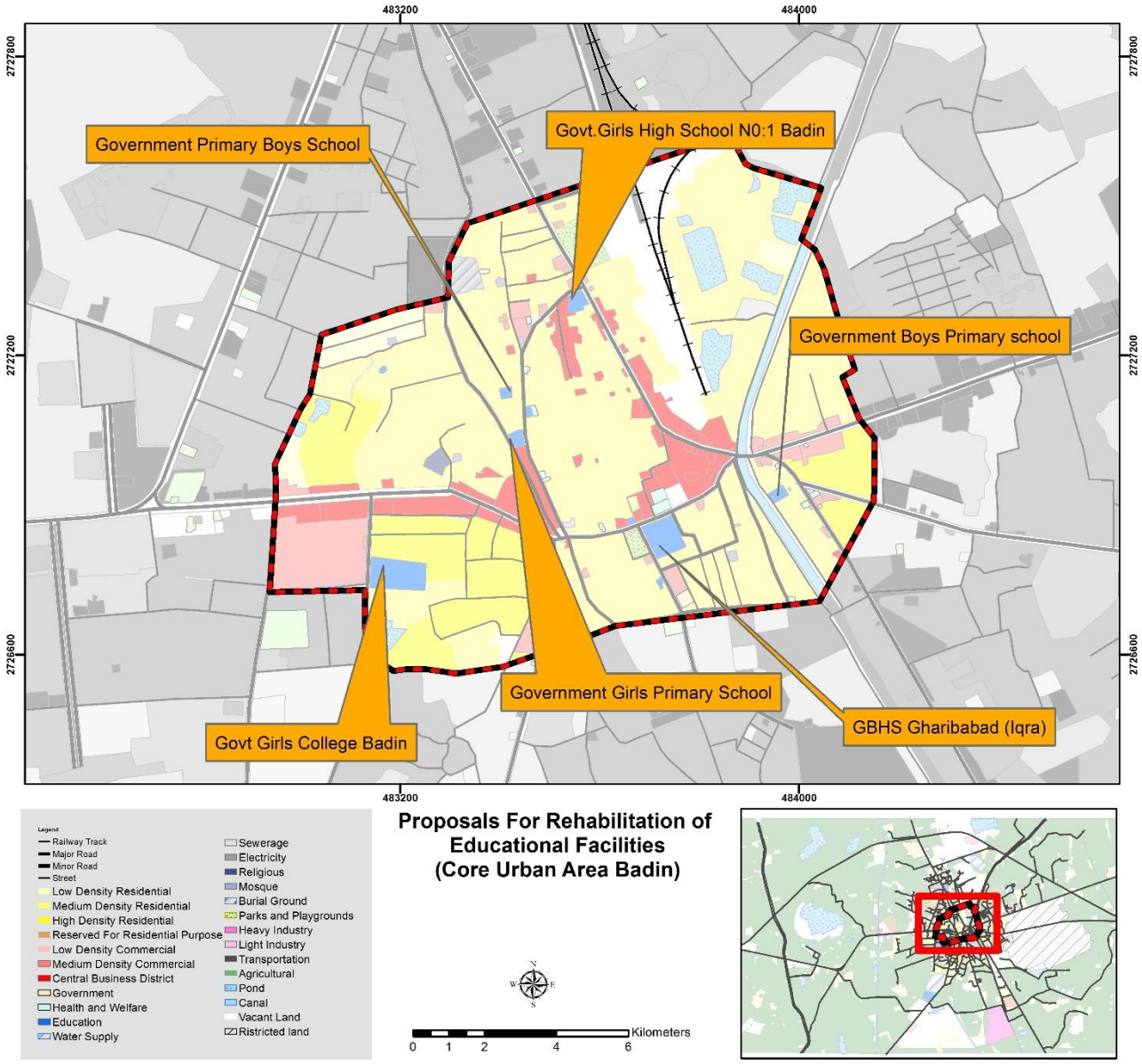


Figure 6-3: Proposal for Rehabilitation of Educational Institutes in Core Urban Area

6.2 Health

6.2.1 Existing Situation

In Sindh maternal health facilities and proper reproductive care is not available at the required scale. Low levels of maternal health and nutrition coupled with high fertility rates lead to high mortality and morbidity among mothers and also children, particularly in the rural areas. The lack of such healthcare endangers the life of the mother and the child. In Sindh the fertility rates average at 6.0 births by women by the age 45-49 and more than 4,000 mothers die every year due to pregnancy related issues. Consequently, poor women's health in Sindh is as much a medical as social problem. Underlying factors here are the lack of awareness of and attention to, women's health needs; women's lower education and social status; and social constraints on women and girls, including the practice of seclusion.

6.2.2 Health Sector at District Level

In district Badin, there is one civil hospital having a 100 bed capacity. Besides, 3 THQ hospitals are having 70 beds, 39 BHUs having 76 beds and 11 RHCs having 116 beds, 136 Dispensaries having 35 beds, and 8 M.C.H.C having 8 beds. There are 5 private hospitals with 84 beds serving the whole Badin district. There are 136 total dispensaries in District Badin out of which 47 are Government owned, 3 are Semi government, 40 are Local Bodies and 46 are private. There are 8 M.C.H.C (Mother and Child Health Center) having 8 number of beds. There are 11 T.B clinics in district Badin.

Table 6-10: Government and Private Health Facilities with Bed Capacity

Level	Number	Number of Beds
Civil Hospital	1	100
Major Hospital	1	20
THQ Hospital	3	70
BHUs	39	76
RHSs	11	116
Dispensaries	136	35
MCH	8	8
Private Hospital	5	84
Total	**204**	**509**

Source: Health Profile of Sindh, 2017

Table 6-11: Dispensaries, MCHC and T. B Clinics with bed capacity

Sector	DISPENSARIES		M.C.H.C.		T.B. CLINICS	
	NO.	BEDS	NO.	BEDS	NO.	BEDS
Govt.	**47**	-	**1**	-	**11**	-
Semi Govt.	**3**	-	-	-	-	-
L. Bodies	**40**	-	**4**	-	-	-
Private/ Missionary	**46**	**35**	**3**	**8**	-	-
Total	**136**	**35**	**8**	**8**	**11**	-

Source: Health Profile of Sindh, 2017

The present total number of doctors in District Badin is 436. There are 3 Physicians, 3 Surgeons, 4 Gynecologists, 4 Paediatricians and 12 Dentists in government hospitals. GMO doctors are 410 (Govt: 326, Semi Govt: 12, Private: 72).

Table 6-12: Doctors staffs in district Badin

Sector	Physicians	Surgeons	Gynecologist	Pediatricians	Doctors/GMO	Dentists
Govt.	3	3	4	4	326	12
Semi Govt.	-	-	-	-	12	-
L. Bodies	-	-	-	-	-	-
Private	-	-	-	-	72	-
Total	**3**	**3**	**4**	**4**	**410**	**12**
Source: Health Profile of Sindh, 2017						

i. The Para-Medical staff of district Badin in public sector includes 60 Nurses, 38 LHV, 64 Midwives, 107 Med. Tech, and 191 Disp. /Dressers.

ii. The Technical medical staff in District Badin in public sector includes 17 Lab. Tech, 13 Lab. Asstt, 19 X-Ray Tech, 8 O.T. Tech, 35 Dental Tech/ Asstt, 10 E.C.G Teach/Asstt, 7 O.T Asstt, and 2 X-Ray Asstt and U-Sound Tech.

6.2.3 Issues

The following are the major issues in the health sector

- Lack of Health facilities such as wards, labs and OT facilities
- Lack of diagnostic and other Health equipment
- Deficiency of transferring serious cases from rural areas to hospitals
- Large number of Vacant posts of doctors and medical staffs in health institutes of the district.
- Lack of training and housing facilities for LHW and paramedical staff
- Shortage of Nutrition
- Accessibility to health care facilities in remote rural areas is difficult.

6.2.4 SWOT Analysis

Strength	Weakness	Opportunity	Threats
Health			
1. Civil Hospital (DHQ Hospital) - tertiary level health facility is available in the district with THQ Hospitals, BHUs, RHCs, MCH.	1. Limited diagnostic facilities available 2. Most of doctor's positions are vacant 3. Number of beds are less as compare to district population	1. More investment is required through PPP mode in health sector 2. More job opportunities for young doctors 3. Need of advance diagnostic laboratories equipped with CT scan, MRI machines	1. Less quick emergency response to health incidents 2. Death rate may increase 3. Difficult to control eradication of epidemics diseases

6.2.5 Need Assessment

- **Present Assessment at district level (Population, Bed Ratio, Doctor Ratio) 2017**

The present bed ratio is one bed for every 3,545 population of district Badin. This ratio is inclusive for private hospitals and medical centers. As per NRM medium-term target of 2 beds per 1000 population for Pakistan. Currently, there is a need for 3,100 additional beds for the district Badin Population. The shortage of staff, medicines, and funds for building maintenance are endemic main problems in the health sector. Present Supply, Need and Gap and Population per Bed Ratio is given in below table.

Table 6-13: Present Need at District Level

Present Population	Beds Analysis			Doctors Analysis		
	Available Beds	Present Need	Required Beds	Available Doctors	Present Need	Required Doctors
1,804,516	509	3,609	3,100	436	1,804	1,368
Source: Calculation based on National Reference Manual (NRM)						

- **Future Supply, Need and Gap (Population, Bed Ratio) 2037**

The consultant considered it appropriate to consider the catchment population of the district to work out the present need assessment and future (2037) requirements. The NRM (National Reference Manual) recommends 2 beds per thousand as the medium-term target. On this basis, approximately 5,521 beds will be required to be provided gradually until 2037. According

to WHO (World Health Organization) standards, doctor to population ratio is 1:1000 so taking that as a reference point the future requirement of doctors comes out to be 2,579 doctors for the future population of District Badin. Future Supply, Need and Gap and Population per Bed Ratio is given below in the table:

Table 6-14: Future Need Assessment at District Level

Present Population	Beds Analysis			Doctors Analysis		
	Available Beds	Future Need	Required Beds	Available Doctors	Future Need	Required Doctors
3,015,143	509	6,030	5,521	436	3,015	2,579

Source: Calculation based on National Reference Manual (NRM)

6.2.6 Policy Guidelines[25]

- Enhance basic health care by making it more accessible & affordable, efficient, effective and timely. This will be achieved by diversifying outlets through the involvement and support of other organizations that provide health or health related services. An important inclusion in this direction will be the extension and enhancement of basic healthcare education in schools, colleges, universities and other technology/vocational training institutions.
- Regulate protection from disease and the quality of healthcare across the province. In this context the Health Department will regularly survey and analyze healthcare statistics, particularly on women, children and the elderly
- Protect people against pollutions of all forms and types, and infectious diseases by promoting public health and by upgrading curative care facilities.
- Enhance and improve existing emergency care facilities and trauma centers, including ambulatory services and paramedic forces.

6.2.7 Strategic Development Plan

The aim of this strategic development plan is to improve health indicators and also Ensuring sound access to primary and secondary health facilities for the target population with a medical care system that is effective, efficient and responsive to the needs of all socio-economic groups, in particular, those of low-income communities and women of reproductive age. Some strategies includes:

i. Long Term Plan

- Tertiary Level Specialized Hospitals to cater Badin District
- Enhancement of Mobile Health Unit for far-flung areas of Badin District
- Availability of ambulance network may be created especially for rural areas

[25] Sindh Vision 2030

- Accommodation facilities for Doctors and Paramedic Staff
- Construction of additional BHUs, RHCs and MCHCs
- Improve health hygiene practices though awareness raising workshops, seminars, and mother and teacher meetings etc. about sanitation, hygiene and communicative diseases.
- Conduct coordination meetings with government health department regarding remote areas where vaccination is not taking place.
- Effective implementation of Health Insurance Programme to reduce catastrophic health expenditures.

ii. Short Term Plan

- Improve access to healthcare facilities as due to long journeys to hospitals many patient die on the way.
- The availability of health facilities (BHU, RHC, Dispensaries) should be based on dual standard of population and distance as against population above. This is important in low density rural areas such as Tharparkar and Badin.
- We can further improve the access through an "Edhi' type ambulance network financed by local charity, in connection with local government bodies and healthcare facilities
- Improve the quality of healthcare services,
- ensure availability of adequate and skilled workforce to fulfill population health needs,
- Expansion of immunization coverage
- Improving functionality of equipment and availability of quality medicines.
- Additional facilities should be provided to medical staff to make it attractive to work in rural areas (like furnished accommodation, discounted utility bills, additional holdings and motorbikes etc.,
- The allocation of Health sector need to be increased to at least 4% of overall budget.

6.2.8 Priority Projects

Health is the fundamental need of the people. Currently health institutes are facing lot of problems due to unavailability of Laboratorial facilities. Shortage of filled doctors, surgical instruments, and lack of machinery are the major issues. Lacke of female doctors and female staff and the condition of BHUs and RHCs are also very poor, there is need to rehabilatate these insitutes to provide sufficent and high quility health to the people of Badin.

S. No	Name	Area in Acres
1	Family Health Hospital	0.11
2	DHQ / Civil Hospital	6.49
3	Thalassemia Diagnostic center	1.69
Total		**8.28**

i. Repair, Rehabilitation and provision of missing Facilities in Health i.e. Family Health Hospital , DHQ / Civil Hospital and Thalassemia Diagnostic center

- **Project Justification**
  Currently health institutes are facing lot of problems due to unavailability of Laboratorial facilities. Shortage of filled doctors, surgical instruments, and lack of machinery are the major issues.
- **Project Benefits**
  This project will provide high quality health facilities and free medicines to the people of District Badin.
- **Implementing Authority -** Government of Sindh - Health Department
- **Estimated Cost: 389.56 Million** PKR Approx. (Short Term)

S. No.	Project Name	Area (acres)	Estimated Cost In Millions	Short Term	Justification
Health					
1	Repair, Rehabilitation and provision of missing Facilities in Health i.e. Family Health Hospital, DHQ / Civil Hospital and Thalassemia Diagnostic center (Considering 60% Built-up)	8.28	389.56	**Short Term**	4.96 acres = 216423.22 sft, at the rate of 1800/- PKR per sft construction cost with all infrastructure cost.

6.2.9 Immediate Action Plan for Core Urban Area

I. **Repair & Rehabilitation of MCH Centre Badin**

S.No	Area / Locality / Address	Area (acre)	Rehabilitation Required - Area wise or job wise cost (PKR)			
			Street / Road / Parking	Provision of all 4 utilities	Public Facilities	Security
1	Repair & Rehabilitation of MCH Centre Badin	**0.32**	**0.64**	**1.28**	**0.64**	**0.32**
Total		**0.32**	**0.64**	**1.28**	**0.64**	**0.32**
Total PKR Rs. Million			**2.88**			

Currently, DHQ Hospital Badin is not included in proposed boundary of core town area. Therefore Repair & Rehabilitation of MCH Centre Badin is proposed to strengthen present diagnostic facilities for population of Badin town.

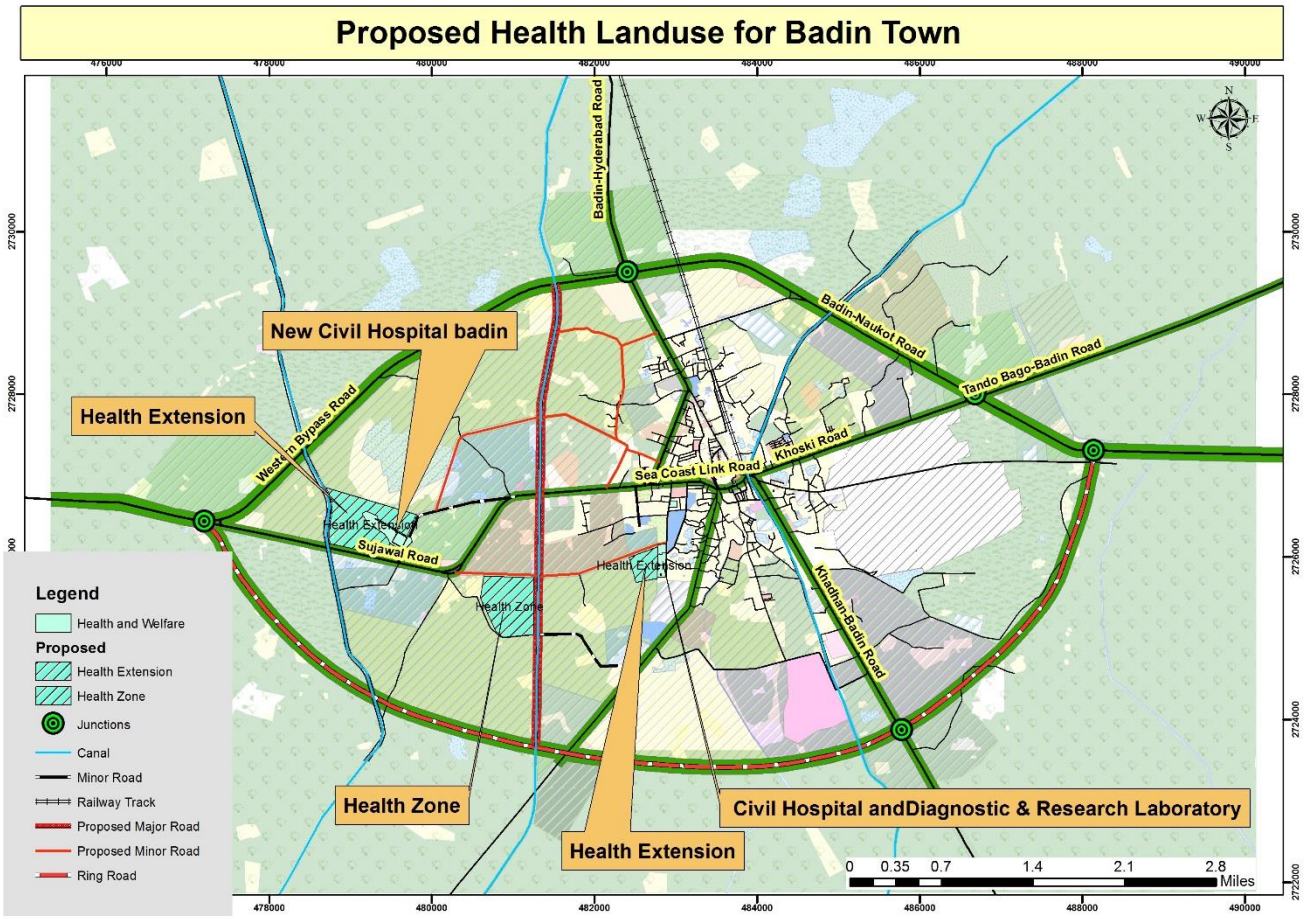


Figure 6:4: Proposal for Extension of Health Facilities for Badin Town

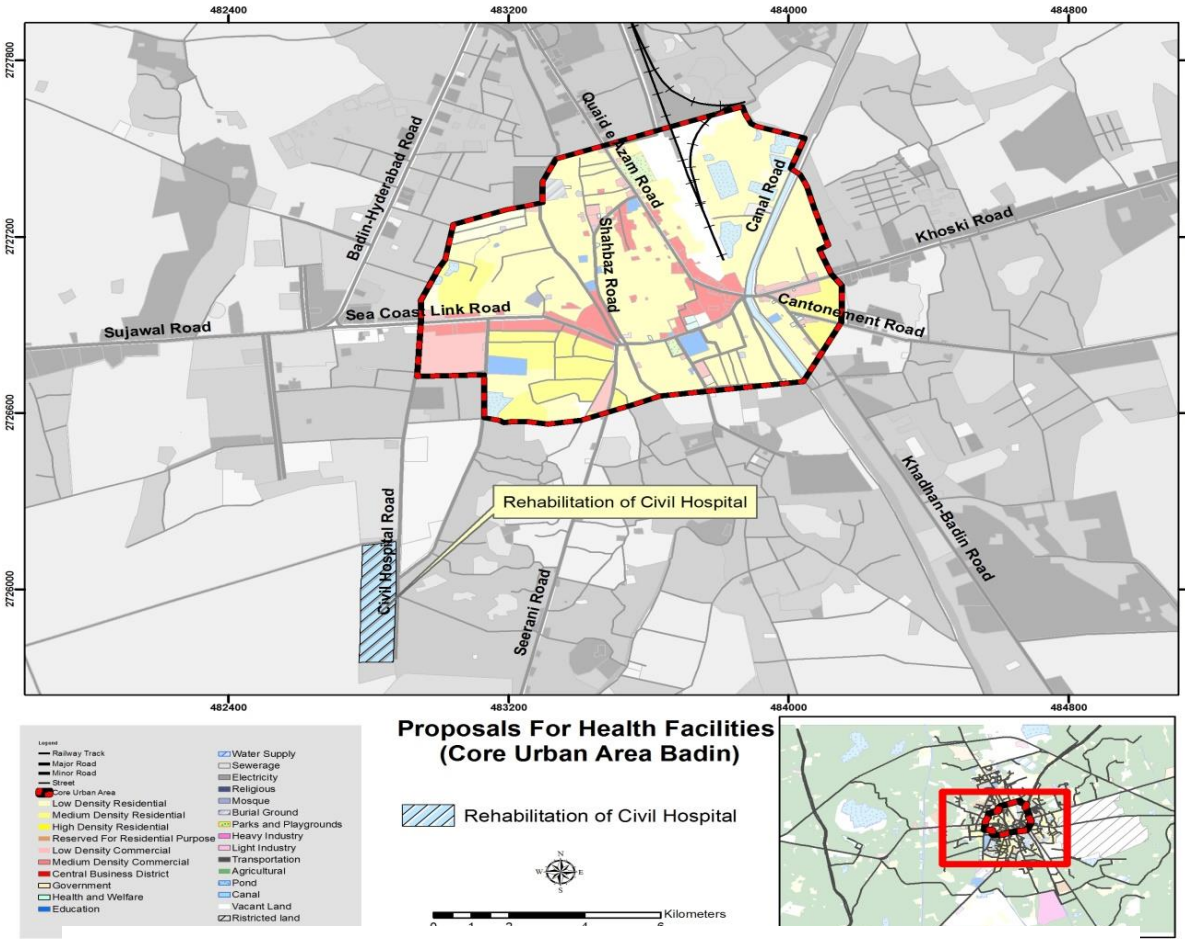


Figure 6:5: Proposal for Rehabilitation of Health

6.3 Recreational

6.3.1 Existing Situation

Recreation represents any rational human activity that results in a pleasurable response, at any time, place or circumstances with attendant enriching physical, intellectual or emotional benefits. Recreational spaces can be defined as public spaces.



Figure 6:6: Park in Badin

Public space is and has been an integral part of communities, serves as a location for people to meet, relax, and exchange ideas.

Public space states “a place where anyone can come without paying an entrance or other fees” Generally, recreation is of two types active recreation and passive recreation.

Active recreation involves playing fields and team participation. Sports, such as cricket football, hockey, etc for the physical and mental development of the younger generation Whereas passive recreational spaces include parks, gardens, hiking tracks, where people of all ages can do light walks, meditate, engage in route searching, nature viewing and family picnicking, etc.

A new genre in recreation has recently emerged as commercial entertainment spaces where families can enjoy a few hours of excitement after payment of a fee. All the types of recreational spaces require land allocation.

Recreational Spaces in Badin

There are only 2 parks in the vicinity of Badin possessing a total area of about 2.16 acres, which don’t have any proper recreational facilities as per standard.

6.3.2 Issues

The main issue is the shortage of water supply to maintain Park and trees plantation.

- Shortage of water facility to maintain green spaces, green belts and trees plantation.
- Lack of reserved area for sports facilities.
- Poor Management for organizing cultural events
- Lack of infrastructure to accommodate visitors into such events.
- Less commercialization from tourism point of view.
- Less heritage preservation.
- Infrastructure is lacking for tourism activities

6.3.3 SWOT Analysis

Sports & Recreation			
Strength	**Weakness**	**Opportunity**	**Threats**
1. Local environment of town supports green urbanism 2. Youth is active in sports related activities	1. Shortage of water to maintain green spaces, green belts and trees plantation 2. Unavailability of sports infrastructure	1. Good health of local communities 2. Air pollution reduction 3. Healthy environment 4. Protection of natural habitat 5. Young sports professionals	1. Give birth to passive recreation 2. Encroachments or misuse of recreational spaces for commercial purposes
Culture			
1. The cultural activities / events of different social groups includes minorities that attract people from its surrounding localities as well 2. Strong potential for producing culturally ornamented products used in daily life	1. Poor Management for organizing cultural events 2. Lack of infrastructure to accommodate and facilitate visitors for such events 3. Lack of opportunities to commercialize / merchandize cultural goods	1. If organized appropriately could generate good revenue as well increase the source of income for local population	1. Security Threats 2. Demise of cultural values and norms

6.3.4 Need Assessment

- Shortage of Public Park, playgrounds and recreational facilities.
- Available Recreational facilities are scarce and in dilapidated condition.
- Lack of interest of local government for provision of recreational health facilities to the people of Badin MC.

6.3.5 Policy Guidelines[26]

- Federally-managed lands and waters afford critically needed opportunities for outdoor recreation,
- Diverse recreation opportunities on Federally-managed lands and waters are an important complement to recreation opportunities on state and adjacent lands,
- Managed outdoor recreation can be consistent and compatible with conservation of natural resources including fish and wildlife and preservation of heritage resources,

[26] NOPRA 2005

- Providing enhanced and expanded opportunities for outdoor recreation can be done within the provisions of existing, multiple-use;
- Clean air and clean water and other environmental objectives are vital components of quality outdoor recreation experiences; and providing quality recreation opportunities
- Badin needs infrastructure and programmes for sports activities, sport completion, gymnasium and family parks, and children play area and gardens.

6.3.6 Strategic Development Plan

The aim of this strategic Development Plan is to provide Recreational Infrastructure of International Standards at District, Protect and conserve the cultural heritage, promote language, art and culture of District and dissemination of information through media. Some of the Strategies are mentioned below;

Canal Beautification:

For the beautification of canals (Kazia branch and Mir wah Talhar) passing through the city, footpaths and walk ways should be constructed and benches should be fixed on the banks of canals to turn them into recreation spots for the locals and to this effect design should be prepared in collaboration with the irrigation department.

Similarly, food courts will be set up in various places along the canal bank (Kazia branch) while spots should be identified for the purpose. Green belt should also be provided for the purpose of facilitating pedestrian movement. Moreover embankments should be reinforced.

For the beautification of canal passing through the city wondrous pathways and vistas can be created along the bank of the canal .Providing Soothing distant tourism opportunity to capture the beauty but not destroy it through increased impact on ecosystem, this can be done by creating a buffer area.

i. Long Term Plan

- Establishment of Sports Complex.
- Proposal of new graveyard on southern side.
- Protection of historical places and cultural heritage.
- Youth development programme for sports and recreation.
- Promote tourism through provision of support facilities.
- Urban Forestation.
- Establishment of new open spaces as well as establishment of indoor and outdoor game facilities.

ii. Short Term Plan

- Existing open spaces in core urban area should be restored and maintained. New open spaces should be identified and created.
- The old houses marked for demolition by Municipal Committee due to danger may be purchased by MC or Local CBO. They may purchase these old houses which have out lived its age and these houses can be converted into small parks
- Development and preservation of cultural heritage.
- Establishment of synthetic grounds, playing turf (for hockey, football) and indoor gym facility.

6.3.7 Priority Projects

Availability of recreational facilities can be a vehicle for positive social change for youth and improve health and well-being. Repair and rehabilitation of Existing parks i.e. Bagh-e-Benazir located near Quaid-e-Azam Road and Bilawal Park is already proposed in Immediate Action Plan. Below projects are proposed for repair, rehabilitation and provision of missing facilities.

S.No.	Name	Area
1	Pir Aali Shah Jelani Ground Badin	12.48
2	Lar Museum	4.86
3	Gymkhana	2.84
Total		**20.18**

- **Project Justification**

  The availability of parks in any city is essential for the safe and healthy environment. There are five recreational places in the vicinity of Badin MC, but due to the lack of management these may hardly be classified as proper recreational facilities as per standard requirement. There are many spaces in the city space which can ideally be converted and developed as recreational purpose. At the prirority basis, sports and recreational areas i.e. Pir Aali Shah Jelani Ground, Laar Museum and Gymkhana (excluded IAP Projects)* needs rehabilitation in the DHQ town. For the priority basis following recreational areas are considered for the rehabilitation:

- **Project Benefits:** It will boost the local economic potential with significant Benefits from local to national level. It will create unique city landscape and generate number of employment opportunities.

- **Implementing Authority:** Sindh Government, Local Government and private investors

Project Name	Long/ Short Term	Proposed Area (acre) & Lengths (m)	Preliminary Cost in Million	Justification
Repair and Rehabilitation of Pir Aali Shah Jelani Sports Ground	Long Term	12.48	234.24	**A.** Spectator area 30,000 sft. Repair & Rehab; @ the rate of 2,000/ sft. - Total 60.00 Million for the Construction of Spectator area. **B.** Playground Area 4.0 Acres (174,240 sft, @ the rate of playground @ rate of 1000/ sft. ○ Total 174.24 Million **A+B = 234.24 Millions**
Provision of Missing Facilities at Laar Museum	Short Term	4.86	100.00	Lump sum amount for provision of missing facilities
Repair & Rehabilitation of Gymkhana	Short Term	2.84	20.00	Lump sum amount for Repair and Rehabilitation of missing facilities

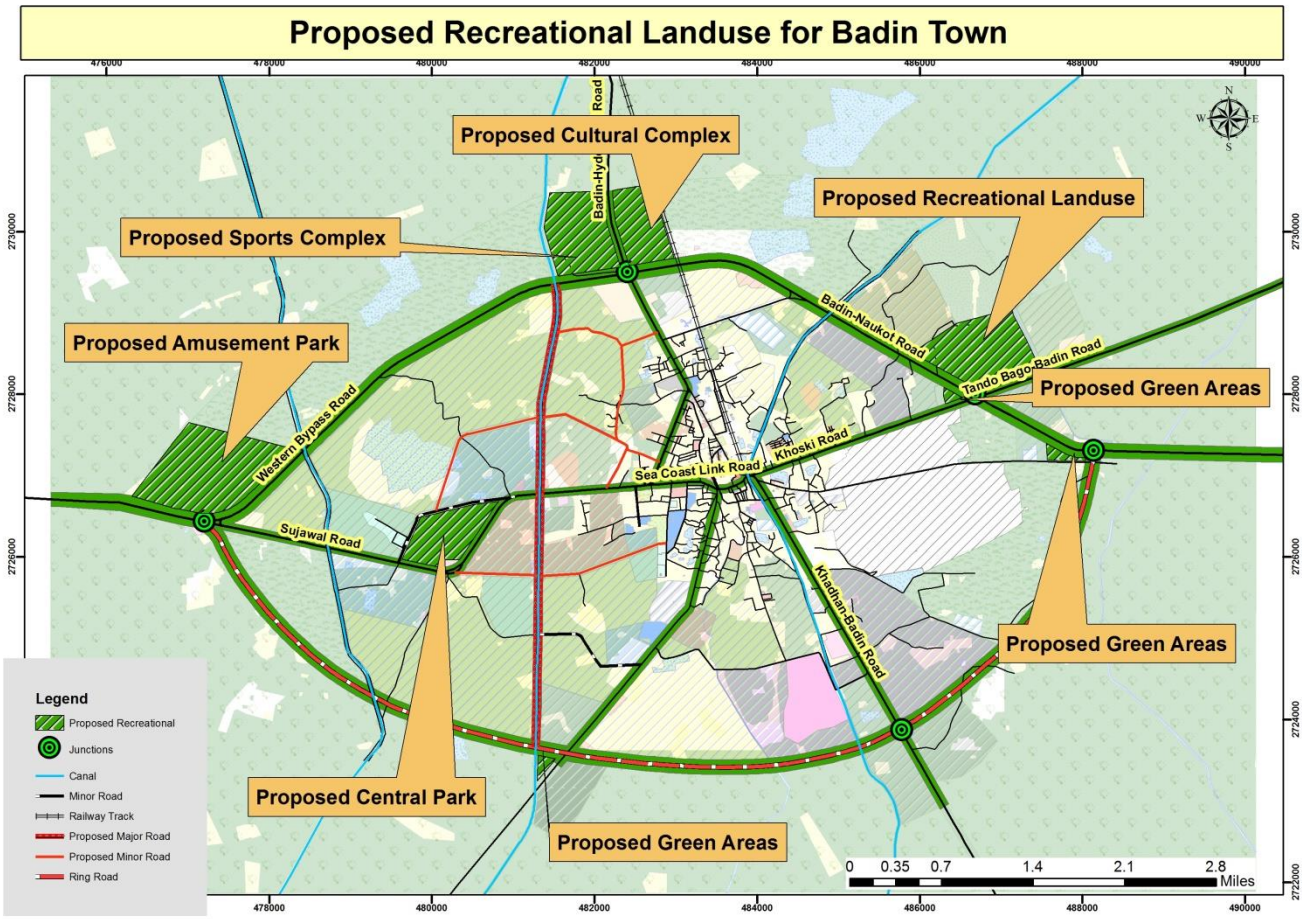


Figure 6:7: Proposal for Future Recreational Land uses for Badin Town

6.3.8 Immediate Action Plan for Core Urban Area

- **Provision of Open Spaces, Parks & Playgrounds**

Availability of recreational facilities can be a vehicle for positive social change for youth and also promoting recreational facilities benefits beyond the traditional aspirations of improved health and wellbeing.

- **Parks**

  Currently, core urban area of Badin is suffering due to acute shortage of compulsory open spaces. Two parks are present in core town area of Badin. Municipal Park / Bagh-e-Benazeer Park is located along Quaid e Azam Road. whereas Bilawal Park located along maine coastal road. To achieve the short term plan on immediate basis the process of land acquisition should be started to fulfill present gap.

- **Sports Facilities**

  There is absence of sports facilities in the core urban area of Badin. Municipal football ground is present along railway track. On immediate basis it is proposed to repair and rehabilitate and matain municipal ground for public use.

RECREATIONAL FACILITIES PRESERVATION							
S.No	**Recreational Site Rehabilitation Site Name**	**Area / Locality /Address**	**Area (acre)**	**Rehabilitation Required Area wise or job wise cost (PKR)**			
				Street / Road / Parking	**Utility infrastructure**	**Public Facilities**	**Security**
1	Rehabilitation of Municipal Park (Bagh-e-Benazeer Park)	**5.27**	1.89	1.89	2.18	2.37	0.47
2	Rehabilitation of Football Ground		2.99	2.99	3.43	3.73	0.75
4	Rehabilitation of Bilawal Park		0.39	0.39	0.45	0.48	0.10
Total PKR Rs. Million				**5.27**	**6.06**	**6.59**	**1.32**
Total PKR Rs. Million				**19.23**			

Note:

1. Rehabilitation of lanes, streets and connection minor and major roads.
2. Utility Infrastructure rehabilitation includes basic services of Water supply, Electricity supply and Gas supply.
3. Public facilities include rehabilitation and provisioning of public toilets, proper seating arrangements.
4. As per the law and order situation security concerns makes the overall impact to uplift the society life writ to secured environment.
5. All these basic services in every DHQ town core areas need to be rehab for quicker revitalization of people's life.

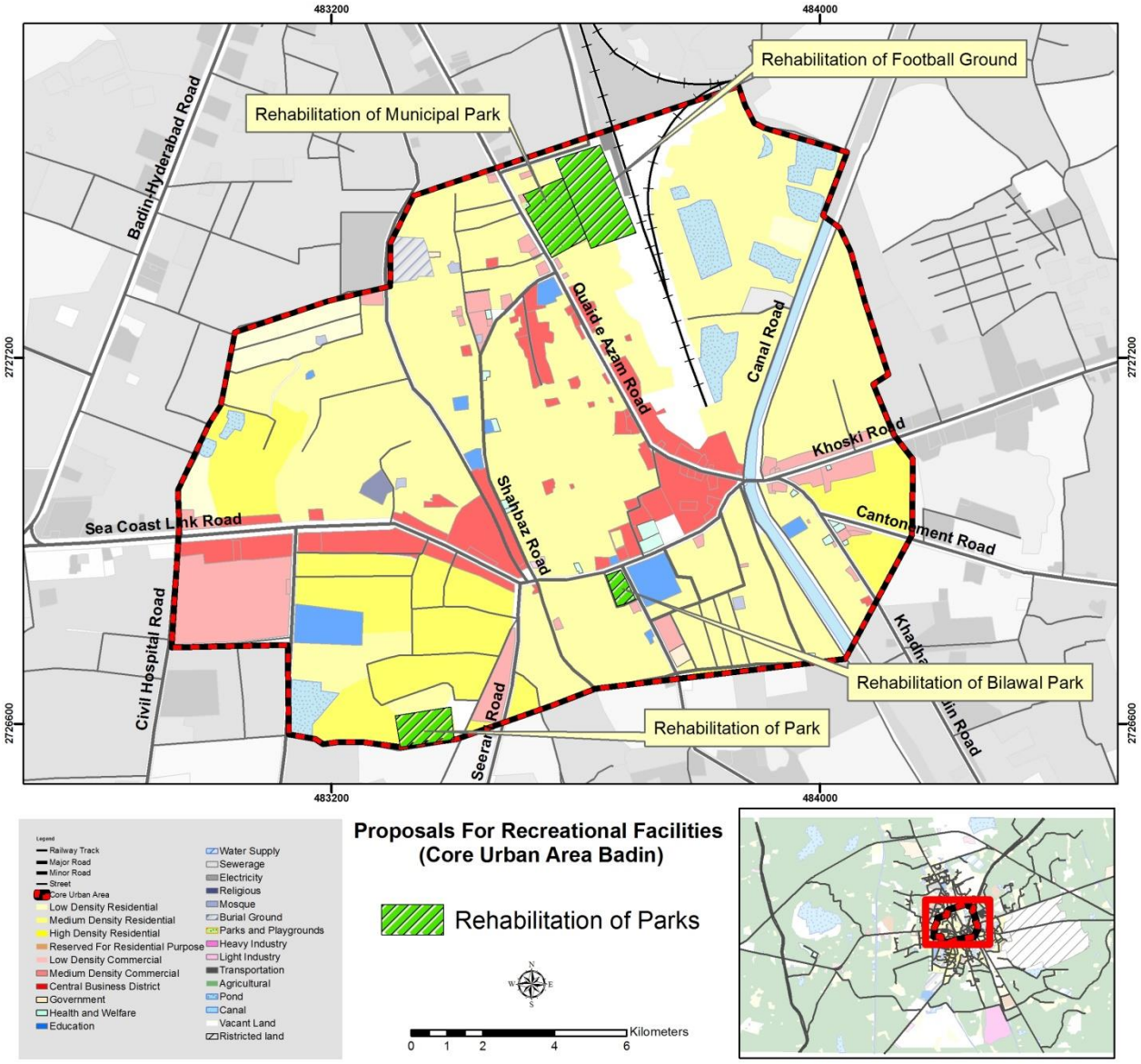


Figure 6:8: Rehabilitation of Recreational and sports facilities present in core town area of Badin

7. ECONOMIC DEVELOPMENT PLAN

Economy of an area or town plays an important role for its sustainability and further growth. Badin is fertile District having its economy based mostly on Agriculture, Sugarcane, Wheat and vegetable. It has Sugar Mill, Chemical Factory, Oil & Gas Companies, Cotton Factory's, Ice Factory's, Floor Mills, Handy Craft, Business & retail trade etc. The progress of economic activities in district depends upon facilitation to farmers by using modern techniques now and surely in the future. The district as a whole is well-known due to its characteristic of agriculture and industrial engine which serves all over Sindh by using market of Hyderabad, the regional Hub.

i. Policy Guidelines for Overall Economic Development

- Creating a better quality of life for the citizens of the district by encouraging private sector to invest in the district.[27]
- Increase farmer's income.[28]
- Improving infrastructure and key services necessary for economic uplift.
- Providing un-interrupted power supply

ii. Inclusion of Poverty Reduction Strategy in Economic Development Plan

The poverty reduction strategy (PRS) is aimed to act as medium-term instrument to address the challenge of poverty in Sindh. One of the intervention of PRS has its foundation resting on poverty reduction at the household level, together with the introduction of an urban programme incorporating a model of urban economic clusters for SME-based enterprise development in small cities and towns, and a model of rural growth centres at meso level that would provide a catalytic effect to the PRS. It has the strength to become a keystone for investment planning in the province, while focusing on Economic Development strategies via PRS lens that will boost the employment opportunities as well as enterprise development in the province.

iii. Strategic Plan for Overall Economic Development

- Modernize and revitalize the service sector
- Implement proactive governance centered on accelerated and balanced economic growth
- Develop Human resources through capacity building for employment opportunities
- Facilitate social support and gender equality
- Reinforce the local governance institutions
- Modernize local / district / divisional administration
- Decentralization of governance authorities
- Involve community participation
- Exploring and implementing PPP (Public Private Partnership) in all sectors

[27] ADP 20017-18 Industries Punjab
[28] ADP 2017-2018 Agriculture Punjab

7.1 Agriculture

7.1.1 Existing Situation

The bulk of the population resides in rural areas of which 65 percent is engaged in farming and livestock rearing. While the farming sector provides a major source of employment for the people in District Badin, land ownership is much skewed. There are either large cultivators/absentee landlords or very small cultivators (mainly small owners-cum tenants and sharecroppers) or laborers. For the majority of the population, most agriculturally related income comes from labor on other people's farms, which easily outweighs income from crop sales.[29] Main Crops are Sugar Cane, Rice, Wheat, and sunflower.
Crops cultivated in Badin can be divided into two main categories:

- Food Crops
- Cash Crops.

Food Crops Include wheat, rice, Maize, Jowar, bajra, and barley while cash crop includes Sugarcane and Cotton.

I. Crop Production

During 2014-15 the Production of Rice was 438,264 M.Tons, Wheat was to 112,835 M.Tons, Sugarcane 2,331,636 Bales, and cotton 121,151 Bales. Whereas, during 2016-17 the production of Rice varies up to 542,967 M.Tons, Wheat 107,884, Sugarcane 2,535,088 Bales, and the production of cotton 89,286 Bales. To address the property issue/ raising of income level waste land available be granted to landless people for utilization. Compared to the provincial/ national level, yields of all crops are small. Raising Livestock, looking to water shortage and proper crop and irrigation water management. The crops, production field, and land utilization is given tables as under:

Table 7-1: Statistics of Crop Production

S. No.	Crops	Crops Production Year2014-15		Crops Production Year2015-16		Crops Production Year2016-17	
		Area (Hectare)	Production (M. tons)	Area (Hectare)	Production (M. tons)	Area (Hectare)	Production (M. tons)
1	Rice	111,885	438,264	115,340	462,058	140,825	542,967
2	Wheat	36,811	112,835	40,825	117,024	37,251	107,884
3	Sugar Cane (Bales)	46,711	2,331,636	41,104	1,665,782	40,074	2,535,088
4	Cotton (Bales)	21,671	121,151	21,491	99,912	19,655	89,286
5	Maize	59	49	71	54	192	160
Source: Development statistics of Sindh 2018							

[29] Socio-Economic Study and Proposal for Livelihood Improvements, 2005: Badin and Thatta Districts, Sindh, Pakistan: World Bank Pakistan

II. Land Utilization

Total Reported area of District is about 612,000 hectares, out of this cultivated area is up to 591,000 hectares. Out of cultivable land deriving, cultivated up to 300,000 hectares leaving 291,000 hectares is Net area sown in 2016-17, where it was 273,000 in 2015-16. Wasteland was available to 18,000 hectares which remains the same in 2017. There was a Minor changing in land utilization occurs in district Badin within one year as mentioned above the land utilization was decreased due to inadequate supply of irrigation water and high rates of fertilizers and pesticides.

Table 7-2 Comparison Land Utilization

Sr. No.	Type of Cultivated area	Land Utilization (Hectares) 2015-16	Land Utilization (Hectares) 2016-17
		Geographical area	Geographical area
1	Cultivated area	573,000	591,000
2	Current Fallow	300,000	300,000
3	Net area sown	273,000	291,000
4	Cultivated Waste	18,000	18,000
5	Not available for cultivated	10,000	8,000
Source: *Development Statistics of Sindh, 2018*			

III. Irrigation Network

Agriculture, in Badin, mainly depends upon canal irrigation. Irrigation is done mostly through canals and tube wells.

The major sources of irrigation in district Badin are Akram Wah, Phuleli and Guni Canals drawn from Kotri Barrage and Nasir Canal drawn from Sukkur Barrage. The district is at the extreme tail end of the irrigation system. The Left Bank Outfall Drain (LBOD) is composed of KPOD (Kadhan Patheji Outfall Drain), Spinal Drain, Cholri weir, Tidal link, and other doro's dhands, canals. The drainage of effluent from Kotri command area is carried through 18 major drainage systems. These drainage systems are carrying drainage effluent into the sea, except for three drains that are discharging into the River Indus. One of these drainage systems, Kadhan Pateji Outfall Drain (KPOD), is connected to the LBOD and Tidal Link for discharge into the sea. The communities in Badin district reported that since their natural resource base has degraded, support is needed to increase their farm productivity. It was suggested that if they are given access to the drainage water through public lift pumps, they would be able to grow salt-tolerant crops. The coastal villages, other than those living in the creek area, depend on the irrigation channels and minor canals for drinking water, which is also stored in the ponds for use when the supplies are low. As

the carrying capacity of the irrigation system has reduced due to poor maintenance, the availability of drinking water is constrained in the tail reaches.

In the year 2015-16, 182,530 hectares were irrigated out of 272,525 hectares whereas, in the year 2016-17, 182,532 hectares were irrigated out of 290,525 hectares. The table below gives information regarding irrigation in the district[30].

Table 7-3 Irrigation by Year Wise

District	2015-16			2016-17		
	Total (Hectares)	Irrigated (Hectares)	Un-Irrigated	Total (Hectares)	Irrigated (Hectares)	Un-Irrigated (Hectares)
Badin	**272,525**	**182,530**	**89,995**	**290,525**	**182,532**	**107,993**
Source: Development statistics of Sindh, 2018						

7.1.2 Issues

- Low returns to farmers due to low procurement price
- Lack of properly certified hybrid seeds
- Lack of agriculture credit facilities to small farmers
- The high price of inputs
- Shortage of irrigation water especially at the tail end
- Lack of pesticides and crop spray
- Lack of tube well installation facilities
- Waterlogging and salinity
- Unavailability of Farm to market roads

[30] Development Statistics of Sindh 2015

7.1.3 SWOT Analysis

Agriculture			
Strength	**Weakness**	**Opportunity**	**Threats**
1. Agriculture based economy. 2. Easy access to local market 3. Agriculture land is suitable for almost all vegetables & crops production	1. Old technics for crop production 2. Less expertise to agriculture extension services 3. Less revenue generation by local government 4. Private land ownership 5. Less effective prices control mechanism	1. Job opportunity for rural population in agriculture sector 2. Healthy population 3. Strong transport system of agricultural goods can largely enhance the economy of the area 4. Outside investors show interest in agriculture sector 5. Agriculture can increase revenue generation	1. Shortage of educated and skilled professionals 2. Less efficient local markets. 3. Shortage of agro based products 4. Low prices of crops
Irrigation			
1. District Badin has an efficient canal irrigation system, which helps in agriculture productivity 2. The major sources of irrigation in district Badin are Akram Wah, Phuleli and Guni Canals of Kotri Barrage and Nasir Canal of Sukkur Barrage 3. Irrigation services through tube well is common in use	1. Negligence regarding timely desiltation 2. Weak banks of irrigation canals	1. Support agricultural activities 2. Opportunities for enhancement of agriculture through tube well irrigation 3. Extension of existing irrigation system will boost agricultural productivity	1. Flooding / over flow of water 2. Water contamination

7.1.4 Need Assessment

The sugarcane prices are unstable in Badin and the industrialists never miss an opportunity to deny farmers their due share. During the crop season, the net take home decreases drastically when the crop is bumper and the industry is not scared of the supply.

7.1.5 Strategic Development Plan

Badin district is producing Cash Crops like Sugarcane, Wheat, Rice and Cotton. In addition to the said crops; Sunflower, Tomato, Melon, Okra and Mustard are also grown. The analysis translates that about **43%** of arable land used for cultivation of rice crop only, might be the reason that soil and climate of the region suits to Rice crop, therefore grower and government may focus to reclaim more waste land to convert the same into arable land and priority may be given to Rice and Sugarcane crop. Other Strategies include:

i. Long Term Plan

- Enhancing crop productivity through adoption of new technologies
- Increase the supply and quality of agricultural crops
- Provision of warehouses for storage of agricultural products
- Establishment of tomato and sugarcane byproduct industries.

ii. Short Term Plan

- Modernize and revitalize agriculture.
- Improved food production to reduce hunger including emergencies and disasters that require agricultural support.
- Agricultural technology development, dissemination and adoption.
- Cross-cutting issues-policy formulation and review, agricultural statistics.
- Use of modern techniques for cultivation by choosing healthy seeds and fertilizers for increasing yield per acre.
- Establishment of cool chain facility.
- Enhancement of the storage capacity.
- Provision of warehouses, food gowdowns for storage of agricultural products.
- Construction of covered gowdown.

7.1.6 Economic Development

Badin District is producing Cash Crops like Sugarcane, Wheat, Rice and Cotton. In addition to the said crops; Sunflower, Tomato, Melon, Okra, Rape and Mustard are also grown. The crops production can be increased by utilizing “Cultivable waste” land and the yield per hectares will also improve with availability of 18,000 hectares “Cultivable waste” land. The analysis translates that about **43%** of arable land used for cultivation of rice crop only, might be the reason that soil and climate of the region suits to Rice crop, therefore grower and government may focus to reclaim more waste land to convert the same into arable land and priority may be given to Rice and Sugarcane crop.

In order to improve the crop production improvement and intervention from government departments are need in the following areas:

- Agriculture credit facilities
- Regular Supply of irrigation water
- Availability of Fertilizer, pesticides and quality seed
- Tube well installation facilities
- Decreasing water logging and salinity
- Construction of farm to market roads

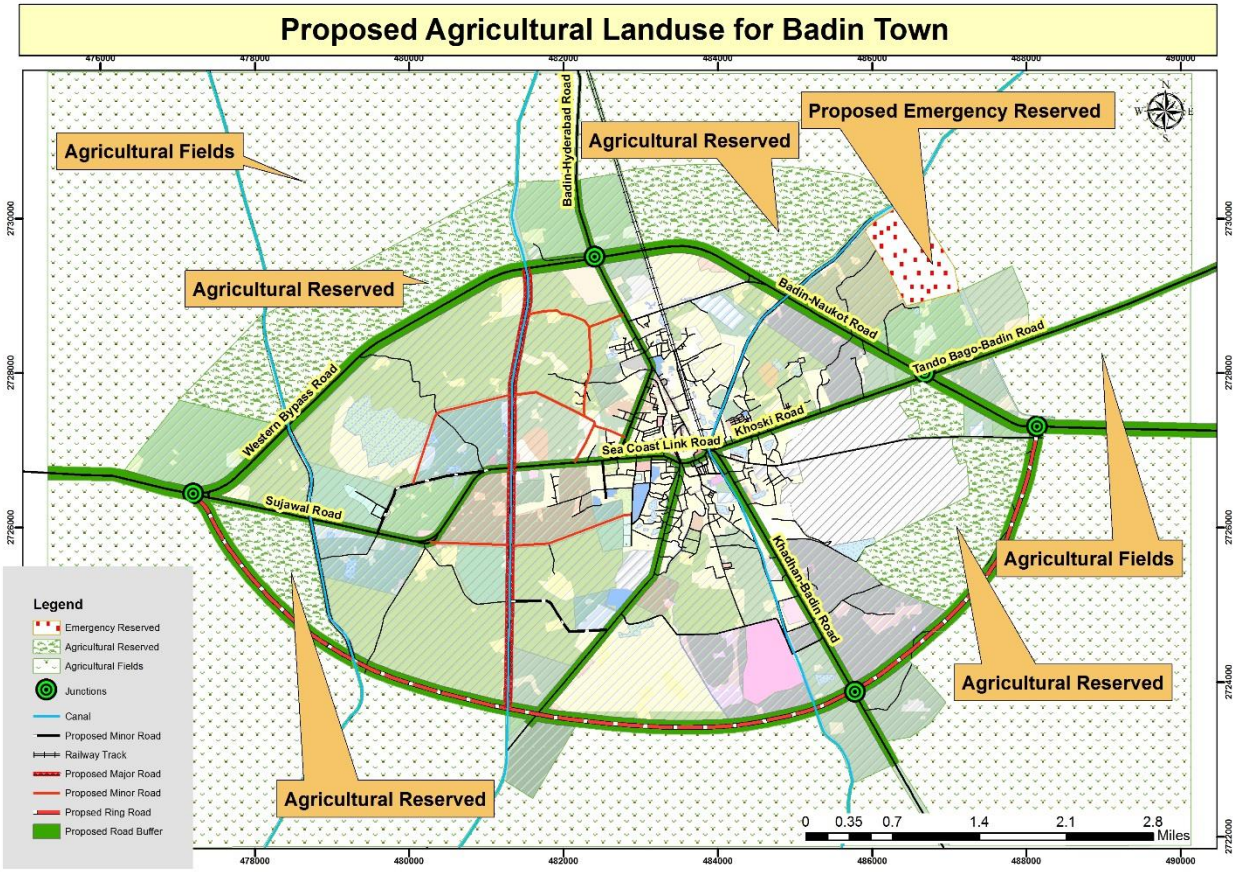


Figure 7:1: Proposed Agricultural reserved for Badin Town

7.2 Livestock

7.2.1 Existing Situation

The livestock sector maintains a unique position within the agriculture sector of Pakistan. It contributes 51% to the value addition in the agriculture sector of Pakistan. It also contributes 9% to the GDP of Pakistan. Besides, this sector provides foreign earnings, dairy products' needs, food security, and daily cash incomes. It helps to reduce income inequalities, especially in case of emergencies (floods, crop failure). Hence this sector is considered as the most secure source of livelihood for small farmers and landless poor. The share of Sindh province in livestock population of Pakistan is 20%.

- **Number of Livestock**

District Badin is a richly populated area having an animal's population of 2,254,000 of large and small animals. This district is well known with a different type of breeds of cattle, goats, and sheep. The animal population of the district includes the highest number of goats having 578,000 heads followed by buffalos 498,000 heads and Cattle 315,000.

Table 7-4 Number of Livestock

Sr. No	Livestock by Category	Population of District	Population of Town
1	Cattle	315,000	750
2	Buffalos	498,000	1400
3	Sheep	223,000	150
4	Goats	578,000	350
5	Camels	9,000	3
6	Asses	19,000	42
7	Poultry	612,000	200

Source: Development statistics of Sindh, 2018 and Livestock Department Badin

- **Veterinary Service**

The services for veterinary in district Badin are deficient because District Badin is a richly populated area having an animal's population, 2257,000 of large and small animals. For this population there are 07 veterinary hospitals and 23 veterinary centres. The services are not sufficient and not serving all population of animals.

Table 7-5: Veterinary Service

Sr. No	Items	Numbers
1	Veterinary Hospital	7
2	Veterinary Centers	23
3	**Animal Treated**	
a	Vaccinated	990,342
b	Treated	68,231
c	Castrated	1,793

Source: Development Statistics of Sindh 2018

7.2.2 Issues of Livestock

- Landlessness and smallholding prevents the farmer to raise livestock on a commercial basis
- Mainly subsistence farming
- Limited knowledge and facilities due to lack of extension service

- Almost for every farmer, livestock farming is a secondary activity and treated as a secondary source of income
- Reduced areas for natural grazing and feed production in the face of increasing urbanization and food security requirements
- Climate change and environment degradation

7.2.3 Need Assessment

The services for veterinary in district Badin are deficient because District Badin is richly populated area having animal's population 2,257,000 of large and small animals. For this population there are 07 veterinary hospitals and 23 veterinary centers. The services are not sufficient and not serving the all population of animals. Improvement in Cattle Farms and Veterinary services would be needed to maintain the sustainable growth by Livestock Department along with private sector. Livestock in the district suffers in particular from shortage of high quality feed.

7.2.4 Strategic Development Plan

- Improving the production performance of livestock in District through manipulation of different minerals and feed supplements.
- Enhancement of Livestock Production and Productivity through strategic deworming and vaccination.
- Establishment of model livestock farms linked with improved supply chain and value addition.
- Establishing new cattle & dairy farms that lead to increase in number of cattle's and quantity of milk.
- Extension of Veterinary Services.
- Encourage the corporate or cooperative livestock farming.
- Establish market mechanism for down scream by products such as milk, meat, hides etc.,

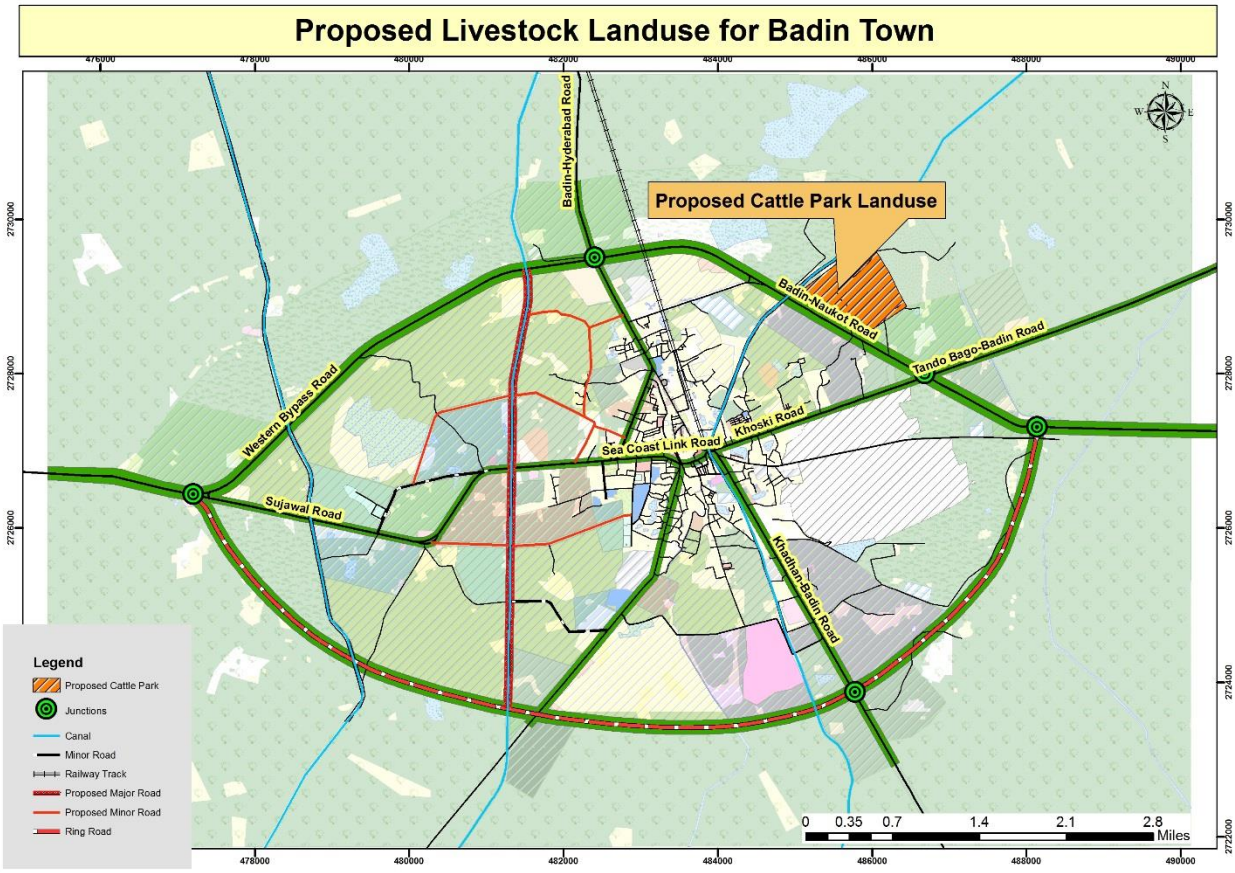


Figure 7:2: Proposed Livestock Park for Badin Town

7.3 Fisheries

7.3.1 Existing Situation

Position of fish farms and fish production are presented in the following table:

Table 7-6: Fisheries-Water bodies, Fish farms & Production (M.tons)

Sr. No.	Items	Numbers
1	Private Fish Farms (No.)	281
2	Fishponds (No.)	555
3	Land used for Fish Farm (in Acre)	20,816
4	Fish Production (M. Tons)	6,906
5	Fishermen (Full Part-time)	3,770
6	Boats (No.) • Sail • Row	 22 305

Source: Directorate of Fisheries Sindh Inland, Hyderabad

7.3.2 Need Assessment

There is need to develop and implement a broad-based fisheries policy which is required for accelerated development of the fisheries sector. Government of Sindh has to take measures to modernize the fisheries sector including establishment of farms on district level to promote fish farming.

7.3.3 Strategic Development Plan

- Need for extension services in private sector
- Lease of fishing rights, conservation, management and promotion of fisheries
- Training through open training schools
- Issuance of district angling licenses
- Local publicity and awareness
- Enforcement of fisheries enactment in their respective domain
- Fish seed stock replenishment in natural water bodies in their respective domain
- Aquaculture development activities through modern techniques
- Collection of statistical data of fish and fish resources in their respective domain

7.3.4 Economic Development:

It is expected that sustainable growth of livestock will be maintained as per main objectives of Livestock & Fisheries Department along with the participation of private sector. Hence there is possibility to:

- Establish livestock and dairy farms to meet the increasing requirement of meat and milk.

- New fish farms and poultry farms in the districts need to be established to generate production and income of the people engaged in this business.

- Moreover, there is need to develop and implement a broad-based fisheries policy which is required for accelerated development of the fisheries sector. Government of Sindh has to take measures to modernize the fisheries sector including establishment of farms on district level to promote fish farming under PPP mode.

7.4 Industries

7.4.1 Existing Situation

Most of the industries in Badin are pertaining to the agriculture and oil field, notable among these are the sugar, oil fields, Cotton ginning factories and Rice Husking mills since Rice and sugarcane is cultivated on large scale in this district.

Badin is an Agro-base district, which complements the agriculture production of this district. Besides sugar mill, small cotton ginning factories are also found in the district. These factories plays very important role in the economy of the district.

Table 7-7: Details of Industries in Badin

Industry	Units	Sugarcane Crushed	Sugar Production
		M.Ton in ,000	
Sugar Mills			
i. Mirza Sugar Mills Ltd, Badin	04	45,800	4.088
ii. Army Sugar Mills Ltd, Badin		262,000	26.361
iii. Bawany Sugar Mills Ltd. Talhar		340,000	39.100
iv. Khoski Sugar Mills Ltd.		272,000	31.280
Rice Husking Mills	70		

On the basis of projected increase in crop production up to 2037 and present industrial base, there is potential for enhancing the capacity utilization of present units and establishing new industrial units.

Addition in industrial units suggested may vary as it is dependent upon the production capacity of each unit. However incentives to private investors will be the key point.

Industrial Zone

There is one small industrial zone in Badin, which may need to be extended. However oil companies work from oil fields, concession areas.

- **Oil & Gas Reservoir**

Badin is considered as an important district with a wealth of Oil and Gas reserves, which brings large revenue for the country. Badin district's crude oil production per day from four of its oilfields was recorded to be 30,000 barrels per day was obtained in 2001, which has been gradually increased.

District Badin is one of the richest districts in producing Natural Resources but the poorest in terms of Human Development.

Discovery of proven and probable reserves of 320 million bbl. of oil equivalent since 1977.

Oil production in Badin accounts for approximately 44 percent of the total oil produced in Pakistan, whereas companies produce 8 percent of the country's gas. According to estimates, the average daily crude oil production from Badin District was recorded to be 20,931 barrels in 1995, 24,002 barrels in 1996 and 25,762 barrels per day in 1997. The highest ever recorded production of 30,000 barrels per day was achieved in 2001. Petroleum companies have employed key professionals and constructed roads, bridges and culverts and has maintained communications, potable water, sewer, and power facilities. Below are the names of Oil field situated in Badin,

- Laghari Oil Field
- Thora Oil Field (Dhsbi Oil Field)
- Khashkheli Oil Field
- Mazari Oil Field
- South Mazari

Oil and Gas resource have has and will benefit community at social, physical and economic level. British petroleum has invested in the social Development of Badin District through the building of infrastructure as well as schools and health facilities for the use of the local population. Despite these positive initiatives in the field of social development of Badin, there is still a great need for even more work in this field because the level of poverty and lack of services for the majority of the people is still a major issue in this area. Nowadays United Engineering Pakistan is working on exploring of these resources. A private company can only contribute so much in the field and the main responsibility lies with the government to provide sufficient funds for socioeconomic development. Since royalties from the oil sector, which are significant, go directly to the federal government, much of the money which should be spent on development of these areas does not reach the intended population. Due to development owed to the oil and gas reservoir, Towns such as Badin and Matli with many of the oil

fields are named as the two main population centers in the district. Most of the agriculture-based population resides in smaller villages

Badin reserves have continued to grow, and an oil discovery in Eastern Sindh has provided the impetus for a pipeline. Karachi is the nearest refining center to Eastern Sindh.

National Refinery Ltd. and Pakistan Refinery Ltd. near Karachi process about 65% of Badin crude and condensate, and 35% is exported via Port Qasim at Karachi to China, Singapore, and Fujairah.

Exports occur-even though Pakistan is a net oil importer-because the Karachi refineries are designed to process Middle Eastern crudes. The Badin blend is light and can be processed by the local refineries up to a certain blend ratio with Middle East crude. At present there are two oil processing units in Badin on the outskirt of town.

7.4.2 Need Assessment

- Vocational training to Women force should be encouraged for establishing cottage industry in the district.
- Small industrial zone in Badin, need to be extended

7.4.3 Strategic Development Plan

i. Long Term Plan

- Provision of infrastructure for establishment of new industries
- Enhancement of colonization in SIEs through provision of missing facilities
- Physical revival of existing oil fields and their expansion
- Enhancing Crop Productivity through adoption of new technologies
- Extension of Sindh Industrial Estate and warehouses in Badin
- Support industrial development
- Modernize and revitalize the service sector
- Establishment of downstream agro industries

ii. Short Term Plan

- Sufficient market infrastructure to ensure optimal value addition
- There are four Sugar Mills and 70 Rice Husking mills in the district and six oil fields present in Badin district which produce crude oil at large scale so oil refineries should also be accommodated in the district so as to improve the economy.,
- Development of Industrial Estates / Apparel Park / Special Economic Zone in District
- Customized lending and micro financing to small industries
- Heritage saving through empowerment of artisans for development of handicrafts
- Provision of vocational training and employable skills to the unemployed youth of the district
- Paradigm shift from industrial agriculture to diversified agro ecological Systems
- Establishment of new industrial estates/Zone
- Strict monitoring of environmental standards for emissions from the oil filed.

- Revitalization of industrial estate
- Completion of small industrial estate Badin
- Removal of Brick Kiln
- Construction / increase storage capacities of cold storage / warehouses for agro products
- Construction / Extension of Industrial Estates to meet the additional demand

7.4.4 Priority Projects

i. Revitalization of Small Industrial Estate of Badin (Kadhan – Badin Road)

➢ **Project Scope & Justification**

At present, Badin is providing sufficient employment through its industrial activities. Land measuring 30 acres is designated for industrial activities along kadhan road and designed 107 plots for various sizes. Small industrial estate is located along Kadhan road in 1986. There will be a need to take actions with basic aim to retain the situation and attract the future investments. There are six Sugar Mills such as Army welfare sugar mill, Bawany, Khoski, Kiran, Mirza and Pangrio Sugar Mill and 70 Rice Husking mills in the district. These different industries provide employment to approximately 6,000 people. While revitalizing the Industrial Estate of Badin, the industrial zone must be bifurcated through green belts as buffer zone to limit the adverse impacts of industrial pollution on adjoining residential areas.

➢ **Project Benefits**

Revitalization of Small Industrial Estate will covers rehabilitation of existing infrastructure, basic utilities and common facilities i.e. roads, sewerage lines, oxidation pond, raw water channel, gas, grid station for electricity and communication system.

➢ **Implementing Authority – BoR, Sindh Small Industrial Development Board. Badin Chamber of** Commerce and Industries.

Estimated Cost: 150.00 Million Approx.

Project Name	Sector	Short Term	Area in Acres	Preliminary Cost in million	Justification
Revitalization of Small Industrial Estate of Badin (located at Kadhan Road)	Sindh Small Industrial Development Board.	Short Term	30.2 Acre	150.00	Per acre cost @ 5 Million / per Acre

Economic Development Plan:

On the basis of projected increase in crop production up to 2037 and present industrial base, there is potential for enhancing the capacity utilization of present units and establishing new industrial units with following limitations:

- Addition in industrial units suggested may vary as it is dependent upon the production capacity of each unit. As noted earlier, establishment of a Small Industrial Estate is already in process which should be completed with required facilities
- Incentives to private investors will be the key element for which Sindh Investment Board and Sindh Small Industries Corporation have vital role to play.
- Considering future growth in industries, particularly Flour Mills, Rice husking Units, Ice/Cold Storage and Cottage industry, the area for Small Industrial Estate may need extension or another Industrial estate would be required.

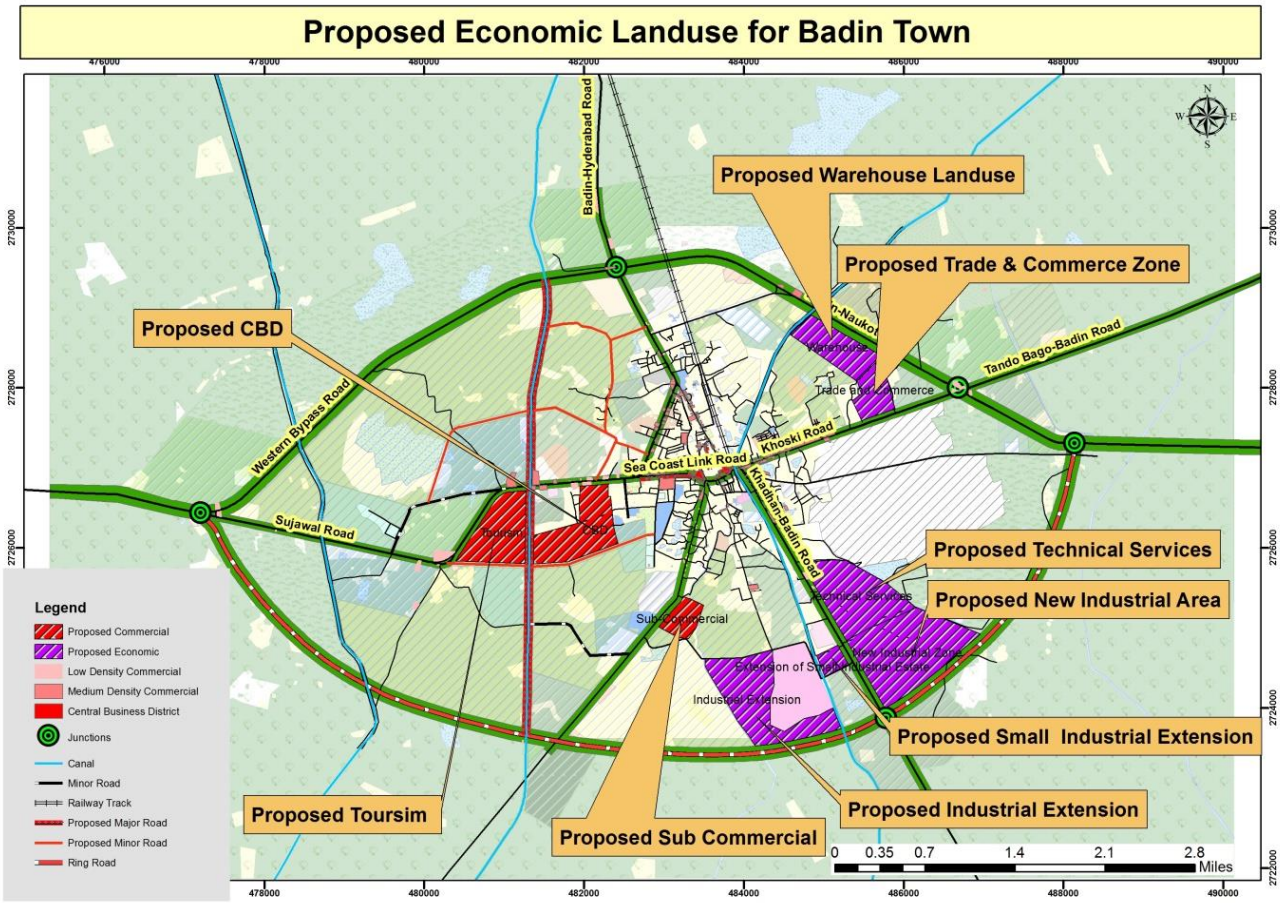


Figure 7:3: Proposed Economic Landuse for Badin Town

7.5 Trade and Commerce

7.5.1 Existing Situation

Badin has commercial hub in main CBD especially along the Quaid-e-Azam Road that includes banks, traders, petrol station, Auto Shops, Medical and general stores. New fruit market is also located in the middle of town.

Commercial Activity is also present along Sea Coast Link going towards Sujawal including Office buildings, CNG stations, Electronics Market, Hotels etc.

7.5.2 SWOT Analysis

Trade & Commerce			
Strength	**Weakness**	**Opportunity**	**Threats**
1. The Badin Chamber of Commerce and Industry supports local business and companies in Pakistan 2. In addition financial institutes are available like banks 3. Regional trading hub 4. Large number of local skilled artisans available	1. The failure of PPP trouble for locals and government 2. Demise of local agriculture market 3. Un-planned local business activities 4. Less tax generation	1. More opportunities for public private partnership 2. Support to local economy 3. Marketing of home grown handicrafts and agro-based products can generate handsome revenue	1. Political imbalances causes Security issues 2. Inflation

7.5.3 Priority Projects

ii. Land Acquisition and Establishment of Fruit And Vegetable Market at Badin

- **Project Scope & Justification**

At present there is no site designated for fruit & vegetable market. Ordinary retail shops for vegetables and fruits are located on the main roads & causes traffic congestion & garbage issues. Provision of new fruits & vegetables market shall resolve issues i.e. congestions & road side waste generation etc.

In development Master Plan approximately 66 acres of land is proposed for Trade & Commerce Zone located along the Naukot road. In that zone 5 acres land comprising general shopping area and offices is reserved for fruit and vegetable market on priority basis. Whereas remaining area of trade & commerce is reserved for Whole sale Market, Slaughter House & Ware Houses for future need. Market involves the amalgamation of heavy food processing truck loading and unloading area with fruits and vegetable stalls along with shops for whole sale and trade processing along

with the public services for the ease of market users at the facility provision of single facility use with all services. Need to plan and develop on basis of services will include on provision of project implementation and on users requirement.

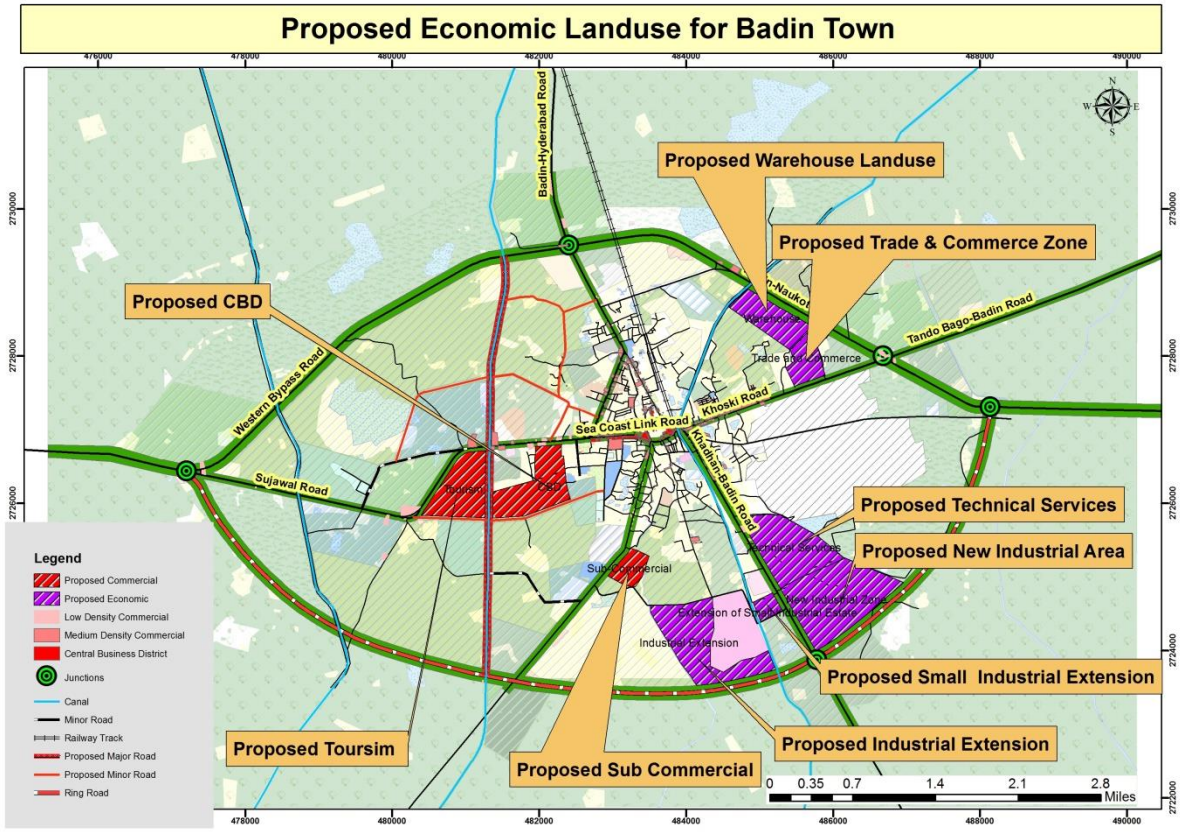
- **Project Benefits**

  It will give ease to the local population to earn their living through it and will also improve the taxation, employment and the traffic congestion which is the major issue of Badin Town due to availability of market in the main core city area.

- **Implementing Authority –**Badin Chamber of Commerce and Industries.

Estimated Cost: 2**50.0** Million Approx.

Project Name	Sector	Short Term	Area in Acres	Preliminary Cost in million	Justification
Land Acquisition and Establishment of Fruit And Vegetable Market At Badin	Economic Development (Trade & Commerce)	Short Term	5 acre	250.00	Per acre cost @ 5,000,000 (5 Million) per Acre



7.5.4 Immediate Action Plan for Core Urban Area

The core town area is the oldest and the most congested part of the Badin town, and facing lot of problems i.e. unavailability of footpaths, outdated sewerage & drainage system, encroachments, illegal Wagon & qingqi stands etc. Main CBD is thriving trade and popular retail businesses in narrow streets and high density low rise buildings occupied by population belonging to various income groups.

The proposed projects for core urban area of Badin town consists on; Removal of encroachments from town center and bazaars, created by the shopkeepers and hawkers; Rehabilitation & Beautification of main Bazar area i.e. Shahnawaz Chowk / Market, Shahi Bazaar, Commercial activities along main quaid e azam road, seerani road, ccostal road, tando bago road, kadhan road and cantonment road.

i. Modernization of Commercial Activity in the Core Urban Area

Badin has commercial has major commercial hub like; Shahnawaz Chowk / Market, Shahi Bazaar, Commercial activities along main Quaid e Azam Road, Seerani Road, Costal Road, Tando Bago Road, Kadhan Road and Cantonment Road. CBD includes traders, wholesale markets, and traditional embroidery shops, Auto Shops, restaurants, schools, clinics and general stores etc. Main CBD located at main Shahnawaz Chowk along costal road.



Figure 7:4: Proposed Economic Landuse for Badin Town

- Up gradation and Beautification of Shahnawaz Chowk.
- Provision of pedestrian facility in the Bazaar area.
- Banned heavy vehicles during peak hours.
- Removal of encroachments (road side bus & wagon stands etc.)
- Rehabilitation of existing market along main roads i.e. Quaid e Azam Road, Shahi Bazar (Shahbaz Market) Road and Khoski and Sea Costal Road.
- Up gradation of old bazaar area
- Banned heavy vehicles during peak hours
- Removal of encroachments

S. No	Area / Locality / Address	Area (acre)	Cost in PKR million.			
			Street / Road / Parking	Utility Infrastructure	Public Facilities	Security
1	Rehabilitation of Main Commercial Areas	54.00	13.50	1.62	20.25	13.50
Total PKR Rs. Million			**48.87**			

Note:

- Commercial areas should be enlisted in Govt. Agency for all services of Trade, Retail, Marketing, Sale etc.
- All commercial areas security services are associated with combine effort of commercial trade union and local Govt.
- Commercial areas accessibility for daily users and marketers is well define with ease.
- Provision of pedestrian facility in the Bazaar area
- Banned heavy vehicles during peak hours
- Removal of encroachments

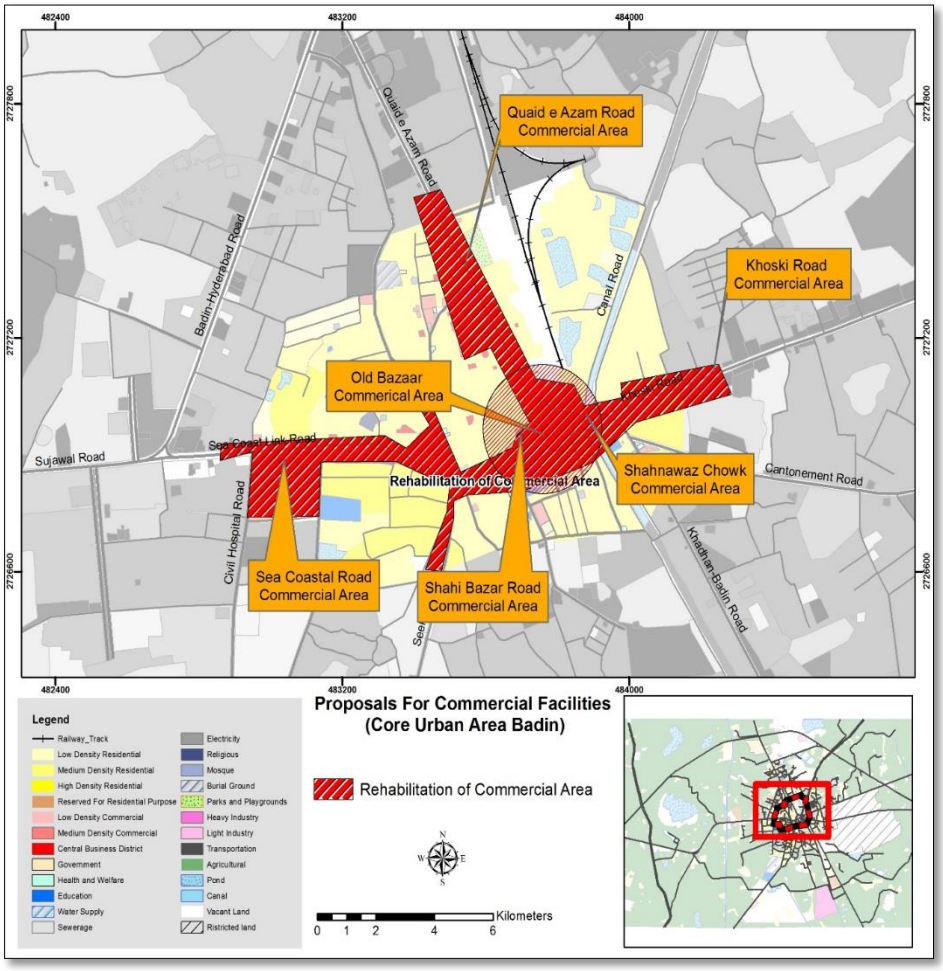


Figure 7:5: Proposal for Rehabilitation of Commercial area

7.6 Economic Development Plan of Headquarter Town with Poverty Reduction Strategy (PRS)

Poverty Reduction Strategy (PRS)

Sindh province is leading the way in being the first province to have taken the bold step of formulating a specific Poverty Reduction Strategy (PRS) for the entire province, which has been approved by the Sindh cabinet on 16th October, 2018. The PRS developed is aimed to act as medium-term instrument to address the challenge of poverty in Sindh and to have a specific focus on Community Driven Local Development (CDLD). This is a logical approach for Sindh, given the GoS initiatives over the last decade in CDLD, through the Union Council Based Poverty Reduction Programme (UCBPRP).

A Vision for Poverty Reduction in Sindh

The poverty reduction strategy is aimed to act as medium-term instrument to address the challenge of poverty in Sindh. As such, the long-term intentions and aspirations of the GoS in reducing poverty should be clear, with a definable 'vision' for poverty reduction and associated goals and targets to be achieved over the specified duration of the Strategy.

Poverty Reduction Strategy (PRS) Approaches

The PRS illustrates three dimensional approaches to reduce poverty at Rural and Urban Level

I. This includes continuation of People Poverty Reduction Program to carry out interventions of financial support and capacity building at grass root level
II. The second proposal entails a model of Rural Growth Centers which will serve as a business hub by clustering the geographically connected and demographically viable village
III. The third approach envisages reducing urban poverty by adding urban economic clusters and creating linkages between rural and urban poverty reduction activities

Poverty Reduction Strategies

The three key strategies of the PRS, and their core components, are:

STRATEGY I Community Driven Local Development (CDLD) – the Foundation

The CDLD Policy is incorporated within and is a component of the PRS continuation of a CDLD approach consists of:

- Building on and expanding the UCBPRP programme
- Mainstreaming a CDLD approach, and integration of this approach with line department activities.

STRATEGY II Addressing Urban Poverty

- The direction of the strategy to address urban poverty is on emphasizing ' urban within rural' – focusing on the small towns within rural areas of Sindh
- The strategy focuses on targeting employment opportunities and enterprise development
- A key approach within this is utilising urban economic clusters as a means to facilitate cooperatives in enterprise development.

Urban Income Enhancement Program and Economic Cluster

In order to address the issues of human development and poverty in districts, the policies and programs are to be developed both for rural and urban areas. These issues for the development of city have been tackled by linking with "Urban Income Enhancement Program" which emphasizes in establishment of "Urban Economic Cluster" focusing on:

- Small Enterprise Development,
- Vocational training and

- Encouraging Women Force for establishing handicrafts and cottage industry

This would lead to creating the opportunities for income generation and employment.

STRATEGY III Rural Growth Centres, or 'Service Hubs'

- This strategy consists of a new approach in the way forward to address rural poverty and development. This involves identification of locational focal points or villages that can serve as a centre for improved facilities and provision of services to the surrounding clusters of villages
- The intention is to consolidate services and facilities in these hubs, to provide growth and development opportunities.

Rural Growth Centre – include the following components but not limited to

- Housing and village up-gradation (internal roads, drains, parks, Masjid)
- Commercial facilities to support local agri-based businesses and services - for example, storage facilities including refrigerated facilities for storage of agricultural inputs and outputs), distribution centers, sale outlets, bank, milk chilling plant, veterinary clinic
- High school for students from villages in the cluster
- Rural Health Centre
- Vocational centre and other community facilities, such as RSP centre
- Drinking water plants.

Honorable Chief Minister, Sindh approved 05 districts namely Badin, Thatta, Tharparkar, Sujawal& Larkana for establishment of Rural Growth Centers (RGCs) as a pilot district

iii) Mainstreaming the Poverty & Policy & Program

In order to initiate the development of a stronger economy of towns, its policies need to be embedded in sector strategies of the following departments along with Municipal Town Committee and Katchi Abadi regulators.

- Industries & Commerce Department
- Local Govt. Department
- Works & Services Department
- Transport Department
- Planning & Development Department
- Reinforce the local governance institutions.
- Modernize local / district / divisional administration.
- Decentralization of governance authorities.
- Involve community participation.
- Exploring and implementing PPP (Public Private Partnership) in all sectors.

iv. Access to Micro-Finance

Access to demand-driven microfinance provided by sustainable microfinance institutions (MFIs) has proven to be a powerful tool for poverty reduction by improving the ability of poor people to increase incomes, build assets, and reduce their vulnerability during periods of economic hardships.

8. BASIC UTILITIES

8.1 Water Supply

8.1.1 Existing Situation

I. Source of Water Supply

Badin is situated in the southern part of Sindh, about 100 km south-east of Hyderabad, in the south of the Indus delta. The general elevation is about 8m (26 feet) above sea level. The area of the district is 6,726 sq.km and the DHQ-Town boundary is estimated as 36.12 sq.km.

The main source of water supply to Badin is the Qazi Wah (canal) which is perennial and runs through the town; the raw water is brown and turbid. The canal remains closed for 15 days in a year.

II. Water Intake

The **Present System intakes water from Qazi Wah (Canal)**, which has a design discharge of 8.1 cum/s (286 cusecs) (according to information from the Sindh Irrigation and Power Department). The water demand of the town can be fulfilled with the canal water.

III. Distribution Network

Water supply at present works out to 5.98 mgd. Water is stored in an underground reservoir and distributed though O/H Tanks of 0.050mgd. The distribution network includes AC/PVC pipes of sizes from 3" to 16" diameter. There is no zoning system of distribution and no water meters are installed. Distribution network improvement (DNI) is essentially required for equitable distribution. The socioeconomic survey conducted by the Consultants shows that 10% of town area has no proper water supply network, while current water supply is serving 90% area of Badin DHQ Town.

IV. Water Quality

The sample was collected from EE-Highways Pumping station (Surface Water). The surface water was found contaminated as per details are given in an analytical report. The sample analysis report shows that the quality of water is generally acceptable except for the presence of total coliform which is twice the acceptable level. There is groundwater available for the town but it is not fit for drinking purposes. The groundwater is saline that's why there is no supply through tube wells or open wells. Therefore, the entire demand depends on the surface source.

V. Existing Water Infrastructure

No.	Item	Qty	Location	Details
1	Water works	2 no.	1. Post Office Road (center of town)	**Intake pumping station: 2 no. pumps, 6" delivery main connected to 12" pipe taking water to sedimentation tanks.**
				3 no. storage/sedimentation tanks; tanks connected in series; capacity 45,600 m^3 (10 million gallons). 1st sedimentation tank (capacity 2 million gallons) gets 2 ft of silt deposit. During cleaning and desilting of 1st sedimentation tank, the water supply is continued through the remaining 2 tanks which have a capacity of 8 million gallons.
				Overhead tank is not used because there is no valve; the overhead tank has problems since the area was struck by earthquake in January 2001.
				Water is pumped directly to the distribution system after chlorination.
			2. Badin-Tando Bago by-pass (northern side of town)	**Intake from distributary channel flowing from Qazi Wah. 9 no. storage/sedimentation tank, with storage capcity 44.87 Million gallon. Water pumped into distribution network as per schedule. There is another pumping station (10 HP motor/pump) which supplies water to the Badin district jail.**
	Total Storage Capacity	12 nos		**62.84 Million Galllons**
2	Quantity of water supplied			**Total water supply for town from all sources is (5.98 mgd)**
3	Rising main, distribution system			**The existing water supply distribution network of the town consists of: 16" dia. – 792 m (2,600 rft) 12" dia. – 5,944 m (19,500 rft) 10" dia. – 640 m (2,100 rft) 8" dia. – 1,920 m (6,300 rft) 6" dia. – 4,846 m (15,900 rft) 4" dia. – 8,534 m (28,000 rft) 3" dia. – 14,630 m (48,000 rft) Total: 31,958 m (104,850 rft)**
4	**Connections**			**There are 6000 water supply connections, i.e. residential, commercial, government offices and colonies.**

VI. Water Treatment Facilities

To meet the water requirement of the town, two water treatment works, including storage tanks for Sedimentation and pumping stations, were constructed in different phases:



(i) Water treatment works on Post Office Road (Phase II). Settled water is supplied without filtration

(ii) Water treatment works on Badin-Tando Bago by-pass (Phase III). Settled water is supplied without filtration and no proper disinfection measures are adopted.

8.1.2 Current Water Supply and Demand

The current water supply to Badin is 5.98 mgd from two different waterworks located at some distance from each other**.** Both waterworks draw water from **Qazi Wah (Canal).** Water is directly supplied from one of the waterworks after chlorination and the remaining is supplied from the other waterworks, without chlorination.



Figure 8-1: Qazi Wah Canal

In compliance to NRM standards, on average 30 gallons of freshwater per head per day is considered sufficient for the population, keeping that in view a water extraction policy has already been outlined by PHED for Badin Town. The objective of the policy would be to ensure an uninterrupted water supply for the town during its peak demand period. Thus, for the present population of 112,420 in 2017, water demand is 3.4 MGD. As per PHED, currently Badin Town is getting 5.98 MGD, so there is no present gap in water supply and demand.

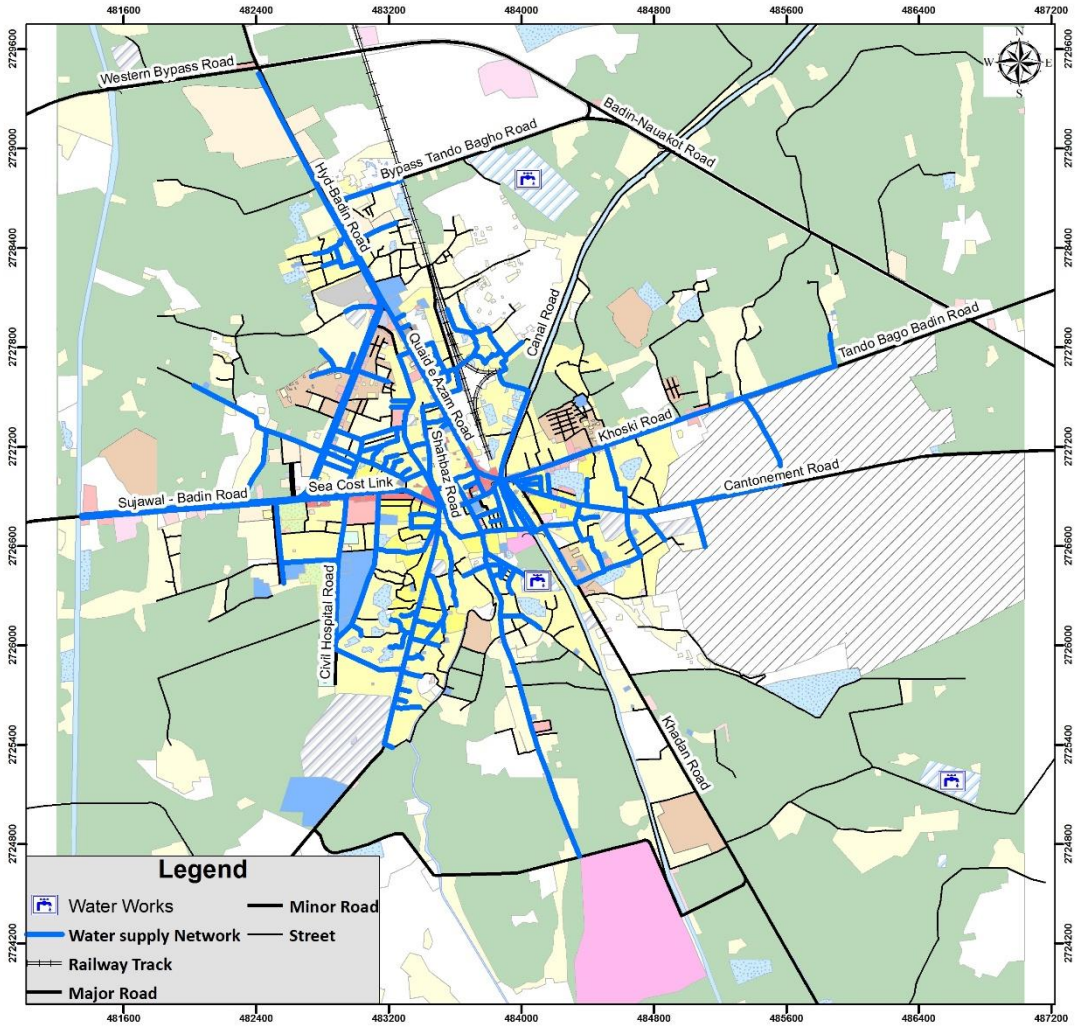


Figure 8-2: Water Supply Coverage Map

8.1.3 Issues:

- Existing supply is adequate, due to weak infrastructure, water loss and contamination people are suffering.
- Water treatment facilities are present but settled water is supplied without filtration.
- Mismanagement, incompetence and negligence in ensuring the provision of safe drinking water to the people.
- Ageing infrastructure and water pipes on road level above ground are causing interrupted water supply.
- In some areas water is not accessible due to absence of water supply network.

8.1.4 SWOT Analysis

Strength	Weakness	Opportunity	Threats
Water Supply & Distribution			
1. Intake sources available 2. Most of the population have piped water supply connections 3. Functional water supply overhead tank	1. In spite of having water connections only few can access water supply 2. Absence of systematic water supply system and treatment plant 3. Poor administrative setup for water supply management and distribution	1. Adequate water resources available for water supply system development 2. PPP in service delivery	1. Negative externalities on human and plant health 2. Depletion of water quality due to draw down

8.1.5 Need Assessment

For a present population of 112,420 persons in 2017, water demand is 3.4 MGD @ 30 gpcd. As town is getting 5.98 MGD, so there is no present gap. Thus it is recommended to supply water as per current demand of the population, which is approx. 3.4 MGD. And the excessive water supply would be stored for other purposes in order to avoid waste of resources and utilize in proper manner. There is groundwater available for the town but it is not fit for drinking purposes. The entire demand depends on the surface source. Water demand and supply has been worked out on PHED parameters is as under:

Table 8-1: Population, Current Water Supply and Demand Projected up to Year 2037

S. No	Year	Population	Water Demand @ 30 gped. (MGD)
1	**2017**	112,420	3.4
2	**2022**	131,023	3.9
3	**2027**	152,704	4.6
4	**2032**	177,974	5.3
5	**2037**	207,424	6.2

Source: Consultants estimate Based on PHED criteria

It is expected that the Badin town will have a population of about 207,424 persons by 2037 and the daily demand of the town will be about 6.2 mgd. for a whole day supply.

8.1.6 Sindh Drinking Water Policy 2017:

Principles:

- Population should be using an improved drinking water source which is accessible i.e. located on premises, available when needed and safe that is free of faecal and priority chemical contamination.
- Access to safely managed drinking water is a fundamental right of every citizen and that it is the responsibility of the Government to ensure its provision to all citizens.
- Water allocation for drinking purposes shall be given priority over other uses.
- In order to ensure equitable access, special attention shall be given to removing the existing disparities in coverage of safe drinking and for addressing the needs of the poor and the vulnerable.
- A supportive policy framework shall be developed that encourages alternate options through private provision, public-private partnerships, the role of NGOs and community organizations.
- Low cost technologies in water and sanitation, that are easy and cost-effective to maintain shall be developed and used.

Objectives:

- Develop criteria for installation of new drinking water supply schemes and ensure that all new schemes are safely managed, rationalized and constructed through need based criteria so that all areas and communities are served.
- Develop standardized service delivery models for both urban and rural drinking water supply schemes to improve efficiency, cost-effectiveness, improve monitoring and sustainability.
- Develop mechanisms for reuse, recycle and recharge of wastewater for other municipal and productive uses.
- Ensure that all drinking water supply systems are designed and constructed in line with the national drinking water quality standards and all municipal discharges comply with National Environment Quality Standards (NEQS).
- Ensure development of water safety plans for all drinking water supply systems.
- Institute adaptation measures and disaster risk reduction and mitigation strategies to minimize the impact of climatic events on drinking water supply systems.
- The minimum acceptable option for the provision of domestic water is that, water will be provided inside the house, through piped system, to meet the minimum requirement of 50 liters = 11.0 gpcd per person per day. In rural settlements water may be provided through communal points to meet the minimum requirement of 25 liters per person per day (5.6 gpcd).
- Where domestic water supply is not of acceptable quality, a provision of at least 4 liters per person per day of drinking water should be provided, such that no household is more than 0.5 km from the point of supply.

8.1.7 Strategic Development Plan

A variety of policy instruments and strategies will be used to achieve the objectives of the Strategic Development plan,

i. Long Term Plan

- Frame a broad policy framework at the provincial level which encourages and supports city district to design and implement policy which is in-keeping with the existing capacities and strengths of institutions.
- Install water treatment plants at existing drinking water supply schemes where required and incorporate water treatment facilities in all new drinking water supply schemes.

ii. Short Term Plan

- The institutional arrangement for implementation and operation of Water supply schemes should be resolved.
- Municipality will adopt a demand led approach in providing access to safe water and sanitation to ensure that scarce resources are properly utilized and ownership and sustainability of schemes is ensured over the long-term.
- Priority for water supply and sanitation will be accorded to un-served, under-served areas, and disadvantaged areas.
- The design and layout of water supply pipes, storage tanks etc. should ensure that there is no contamination by overflowing sewerage systems, for example by maintaining a minimum distance between the two systems.
- Wherever possible, preference should be given to rehabilitate existing schemes (functioning or not) over the construction of new schemes, unless there are special reasons to justify otherwise.
- All Schemes are non-functional, water no DNIS and sewers are shallow not achieving self-cleansing velocity.
- Rehabilitation of existing Water Supply Network.

8.1.8 Priority projects

i. Provision of New water supply network for 10% of Badin MC (Approx. 211.33 Acres)

Project Size	
Population of Badin MC	112,420
Landuse of DHQ town excluding agriculture, vacant land & water bodies Area in Acres	2,339.7
Core Town Area in Acres	226.34
Remaining Urban Area in Acres	2,113.36
Installation of New water supply scheme for 10% (211.33 Acres) of Badin town @ Rate of 3.0 Million Per Acre	634.00

➢ **Project Justification**

According to socio economic survey results, about 10% population of Badin DHQ Town has no water supply network & dependent on hand pump & community wells. People purchase their potable water through tankers due to unavailability of water supply network. This project will help to make possible supply of water in those areas where the network is not available and existing network is discontinued. Provision of New Water Supply Network will cover main **components i.e. Excavation, Pipe cost,**

Gate valve/ Washout valve/ Air release valve, Joints repairs, Balancing slopes at all network, Checking of pipe life with rupture checker and Valves for area wise pressure maintenance.

- **Project Benefits:** As already discussed above that10% of Badin MC has not a proper supply of clean Water. So after implementing this project, the Potable water will easily supply to the rest of town.
- **Implementing Authority:** Government of Sindh- PHE Department Badin MC
- **Estimated Cost:** 634.00 Million PKR Approx. (Short Term)

ii. Repair & Rehabilitation of Water Supply Network 90% Badin MC (Approx. 1,902.02 Acres)

- **Project Identification & Justification**
- Existing Water Supply network in Badin DHQ Town is in poor condition and most of it requires repair & rehabilitation. According to socio economic survey results, about 90% population of Badin DHQ Town has water supply network available & rest of dependent on hand pump & community wells. This project will help to improve the capacity of supply water schemes already exist in town. Repair and rehabilitation covers main components like; **necessary Excavation, Pipe cost, Gate valve/ Washout valve/ Air release valve, Joints repairs, Balancing slopes at all network, Checking of pipe life with rupture checker and Valves** for area wise pressure maintenance.

Project Size	
Population of Badin MC	112,420
Landuse of DHQ town excluding agriculture, vacant land & water bodies Area in Acres	2,339.7
Core Town Area in Acres	226.34
Remaining Urban Area in Acres	2,113.36
Installation of New water supply scheme for 10% (211.33 Acres) of Badin town @ Rate of 3.0 Million Per Acre	634.00

- **Project Benefits:** After implementing of this project, the Potable water will be supplied to rest of area of Badin MC.
- **Implementing Authority - Government of Sindh- PHE Department Badin MC.**
- **Estimated Cost: 1,902.02 Million PKR Approx. (Short Term)**

iii. Repair & Rehabilitation of Water Treatment Works

- **Project Justification**

At present, the water sources for Badin MC is Qazi Wah. To meet the water requirement of the town, two water treatment works, including storage tanks for sedimentation and pumping stations, were constructed in different phases:

(i) Water treatment works on Post Office Road (Phase II). Settled water is supplied without filtration

(ii) Water treatment works on Badin-Tando Bago by-pass (Phase III). Settled water is supplied without filtration and no proper disinfection measures are adopted.

The entire water demand depends on the surface water. The surface water is found contaminated as per the details given in an analytical report. Thus it is recommended to utilize both existing water treatment works for providing filtered water to Badin Town through their rehabilitation.

- **Project Benefits**

This project will help to provide filtered water supply to the town, in order to avoid consumption of contaminated water by the people of Badin Town.

- **Implementing Authority -** Government of Sindh- PHE Department Badin
- **Estimated Cost:** 100 Million PKR Approx. (short Term)

Proposed Priority Projects						
S. No.	Project Name	Estimated Cost In Millions	ADP	Non ADP	Status	
					Short Term	Long Term
Water Supply						
1	Provision of New water supply network for remaining 10% (211.33 Acres) except core urban area.	634.00	-	Non ADP	(Phase Wise)	-
2	Repair & Rehabilitation of existing Water Supply Network 90% (1902.02 acres) except core urban area.	1902.02	-	Non ADP	(Phase Wise)	-
3	Repair & Rehabilitation of Water Treatment Works	100.00	-	Non ADP	(Phase Wise)	-

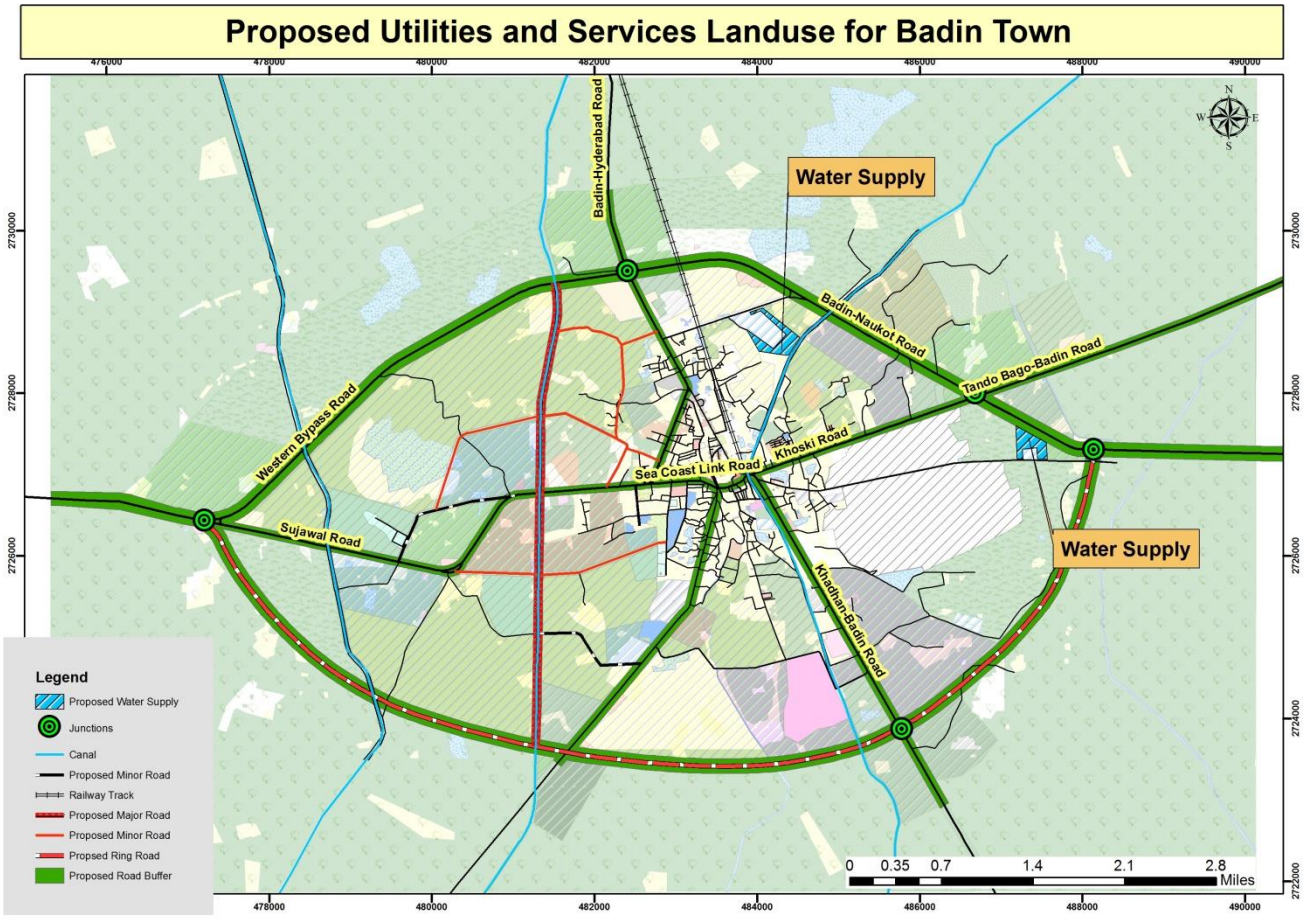


Figure 8:3: Future Landuses for Water Works for Badin Town

8.1.9 Immediate Action Plan

- **Water supply Network Core Town Area**

  Existing water supply scheme of core town area has passed ages and became outdated, core area of Badin is counted as densely populated area of DHQ town, residents of core town area are complaining regarding the quality of water supplied to residents. Mixing of drainage with fresh Water is major issue observed during survey. So therefore it is proposed to repair & rehabilitate existing water supply network of core town area.

Rehabilitation of Existing Water Supply Network of Core Urban Area Badin (226.34 Acre)				
S. No.	**Name**	**Area (acre)**	**Per acre cost (PKR) million**	**Cost (PKR)**
1	**Water Supply System:** (Water supply system renovation includes supply pipe networks, pumping machinery and equipment's for more efficient and effective supply of water).	226.34	1.0 million Per acre	226.34
			Total Cost (PKR). Million	**226.34**
Note: Water supply system renovation includes supply pipe networks, pumping machinery and equipment's for more efficient and effective supply of water.				

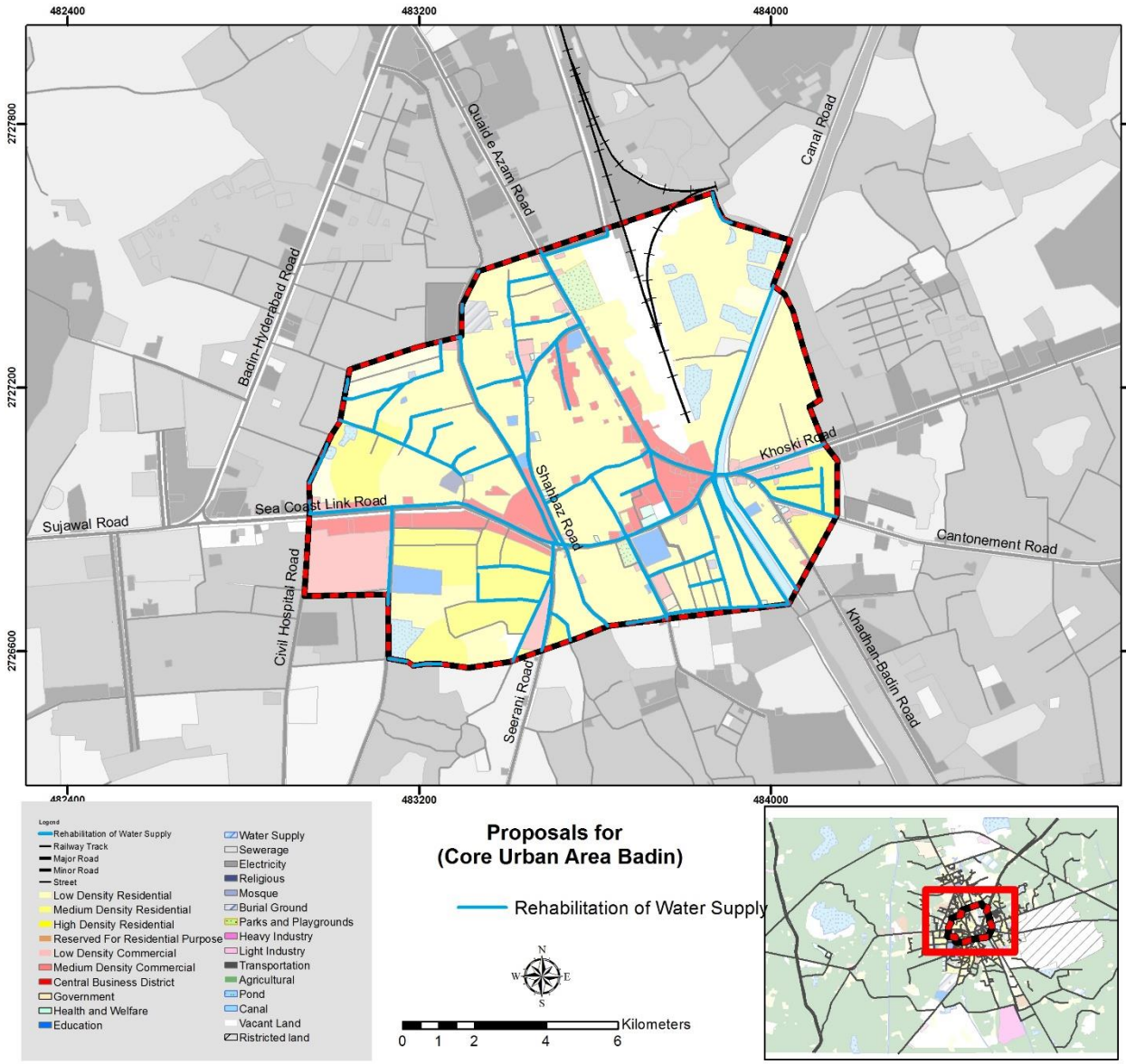


Figure 7-5: Immediate Action Plan for Rehabilitation of Water Supply Network of Badin Town

8.2 Sewerage and Drainage

8.2.1 Existing Situation

Coverage by a sewerage/drainage network ranges from 51% of the Separate type of 49% of combined surface and wastewater disposal systems in Badin. The majority of socioeconomic survey respondents were dissatisfied with the current sewerage systems. Sewerage is mainly disposed of in roadside drains, and untreated sewerage collects in ponds/swamps considered as oxidation ponds is not valid.



Figure 8:4: Non Functional Drain due to overflows

Sewerage and Drainage Components

According to the information provided by the Municipal Committee and consultant survey the sewerage and drainage system of Badin town consist of underground pipe sewers constructed in various phases. The sewerage/wastewater gravitates to the collector wells of two pumping stations and open surface drains, Pumping stations are located one at the railway station and the other on Cantonment Road, and is pumped through 10 HP pumping units at each pump house and discharged into the Old Mir Wah (Old Bhuda) which is the main carrier of sewerage in Badin town.



Figure 8:5: Oxidation ditches

Details on the infrastructure are summarized below.

- 2.4 mgd sewerage generated
- Conveyance is by gravity flow in the surface drain and pipe sewers to 5 pumping stations for final disposal to Irrigation canals.
- System is undersized and shallow sewers laid
- No treatment.
- Poor condition of sewerage and drainage is the main municipal services problem, and cause of waterborne diseases.
- Rehabilitation and extension of the system are needed.

Underground sewerage system, but needs to be properly designed and installed

Treatment Facilities

Wastewater is not treated since treatment plants (oxidation ponds) are not operational due to the shortage of technical staff and funding.

Disposal

Final disposal of effluent is mostly to the Old Mir Wah Nala (Old Bhuda) pass through the central portion of the town and finally discharges into the sea through a SCARP drain. The nala is more than 2 km in length and its width varies from 3.7 to 6.7 m (12-22 feet). A section in the middle of the town is made pacca (cement concrete) and covered in places; the remainder of the nala is katcha. The drainage system is in poor condition, with open smelly drains and sewers. There is no sewerage treatment, and untreated sewerage collects in ponds/swamps. Drains are blocked by garbage and vegetation. Main disposal stations are Cantt Road, Bhatti Mohalla, Qazi wala Railway, Agrovel Colony, Haji Hashim Khaskheli, Kumbhar Mohallah, Sheedi Mohallah, Civil Hospital, Office Disposal and Chandia Mohallah[31]

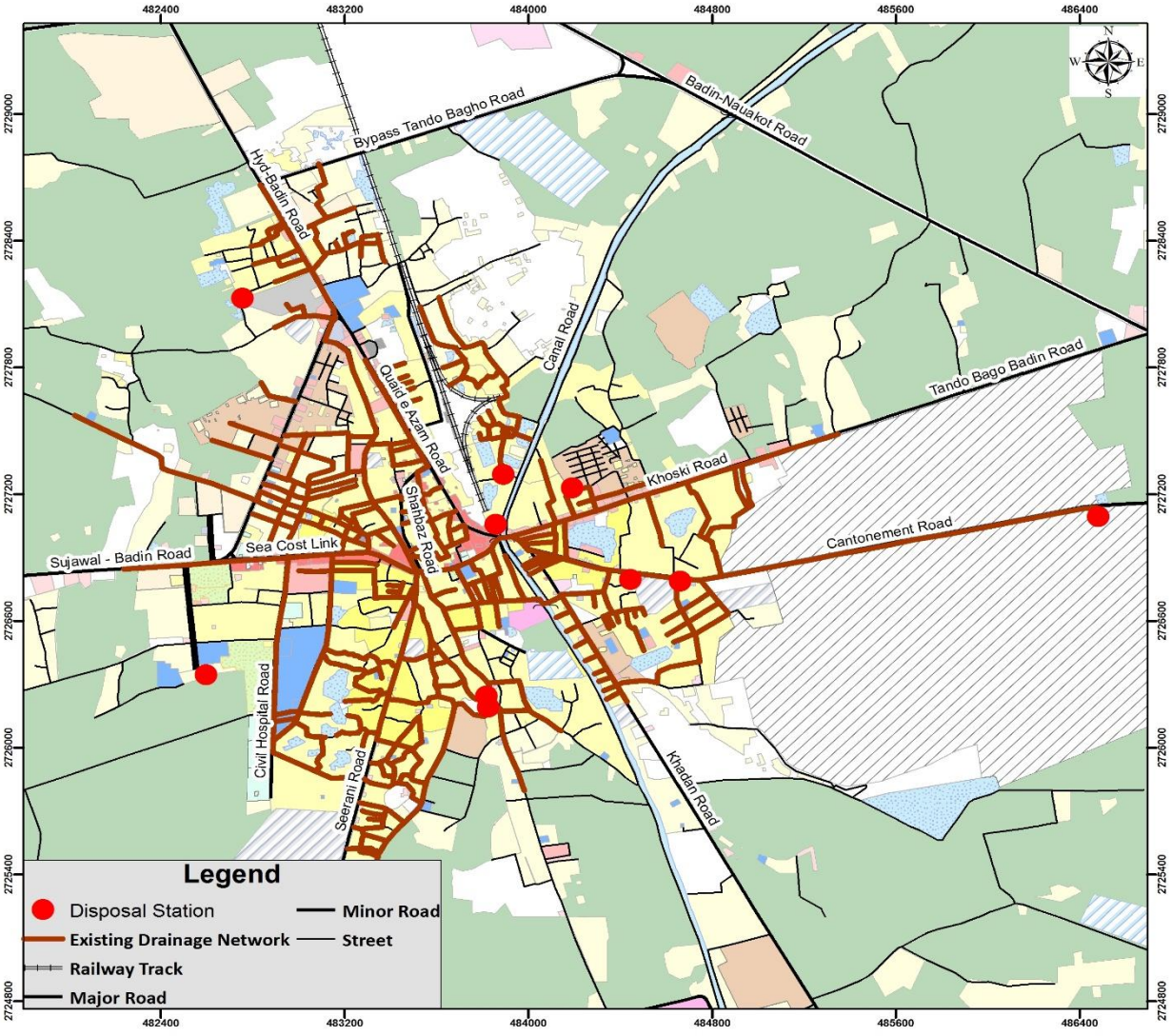


Figure 8:6: Drainage work of Badin Town

[31] Data provided by MC Badin

8.2.2 Issues:

- Improper operation and maintenance of sewerage facilities.
- Inefficient record of operation and maintenance works including machinery and equipment available for cleaning drains / sewers – in the same manner, little information in written form is available on the performance of pumping and treatment facilities such as flow rates, operation hours, water qualities, facility failures and repairs and so forth.
- Many informal settlements are located in poorly drained low lying land that can be subject to flooding, resulting in ponds of stagnant water in their midst and providing breading grounds for mosquitoes and water borne diseases. There is no standby pumping equipment at disposal stations.
- The drainage system and structures are in poor condition with open smelly drains and sewers.
- There is no sewage treatment and untreated sewage collects in ponds / swamps or directly discharge in to irrigation canal. The residents were dissatisfied with current sewerage system.
- No waste water treatment plant, thus raw sewage is being discharged into water bodies.

8.2.3 Need Assessment

The quantity of waste water generation is calculated on the basis of water demand instead of water supply. As it is recommended to supply water as per current demand of the population, which is approx. 3.4 MGD and the excessive water supply would be stored for other purposes. In this way waste water generation will be based on water demand to avoid waste of resources and utilize in proper manner.

Table 8-2: Estimated Wastewater generation for the period 2037

Town		2017	2022	2027	2032	2037
Badin	Water Demand	3.4	3.9	4.6	5.3	6.2
	Sewerage Flows @70 % water demand mgd	**4.1**	**4.1**	4.1	4.1	4.3

Source: Consultant's Estimation

The percentage of served and unserved area is 66% and 36% area respectively.

8.2.4 SWOT Analysis

Sewerage and Drainage			
Strength	**Weakness**	**Opportunity**	**Threats**
1. The existing sewerage system facilitates the	1. Most of the households does not have provision of	1. An appropriate sewerage system plan could be implemented.	1. Health hazards 2. Storm water flooding/ over flow of sewers

Sewerage and Drainage			
Strength	**Weakness**	**Opportunity**	**Threats**
urban area of the city 2. Combine system (open channel and sewer) serving most of the town area 3. Sufficient land for disposal sites is available	infrastructure for sanitation purpose 2. Poor maintenance condition; garbage enters into sewers 3. Drain water is disposed untreated into canals 4. Open sewers and drains 5. Outdated and disconnected network 6. No treatment before disposal of sewerage 7. No policy for re-cycling, and reduction in generation of sewerage 8. Rain/Flood water still standing in town centre areas	2. Improvement of general hygiene/ public health by cleaning sewerage system 3. Development of well-designed trunk sewerage network with less number of disposal station. 4. Planning for well-connected gravity based open drainage system covering ponds 5. Job opportunities for skilled staff for proper maintenance 6. Revenue can be generated by charging services for cleaning. 7. PPP in service delivery 8.	3. Environmental degradation 4. Removal of encroachment 5. Land grabbers

8.2.5 **Sindh Sanitation Policy 2017**

Targets:

Its key targets are:

- Eradicate Open Defecation from Sindh Province by 2025, while 70% villages of 13 high priority districts achieve the status of open defecation free by 2020.
- 100% households in Sindh have access to and use sanitary latrines by 2025, while 70% of rural households in high priority districts will achieve this by 2020.
- Strengthen and implement liquid waste management with sewer lanes and Covered/improved drains with 85% coverage of urban areas and 60% coverage in rural areas.
- Create and develop wastewater treatment mechanisms to cover 75% of urban areas and 40% in rural areas by 2025.
- More than 90% of rural households and 100% of urban households wash hands with soap at critical times by 2025.

Principles:

- The Policy aligns itself with the goals and targets of the SDGs for sanitation, which require sanitation services to be safely managed, have a private improved facility where faecal wastes are safely disposed on site or transported and treated off-site; plus a hand washing facility with soap and water.
- Safely managed sanitation services is a fundamental right for all persons in Sindh province, and should be ensured through enhanced access to marginalized and low resource areas with

equitable distribution of resources. Recognition of inequities and rights based programming will be given key emphasis during the planning, execution and monitoring of sanitation programmes.

- The policy seeks to prioritize the areas that pose the greatest risk to human health namely hygiene awareness and excreta disposal, and then address the environmental health risks that are posed by poor drainage and solid waste disposal.
- Increase access to high quality nutrition-sensitive services, including access to water, sanitation facilities, and hygiene.
- The policy shall promote the community led approaches to strengthen the demand for safely managed improved sanitary conditions that emerges from local communities. The multistakeholder partnerships and collaborations comprising of citizens, governments, civil society, non-governmental organizations (NGOs), donors, academia, media, etc. be encouraged to maximize the synergies in designing and implementation of interventions.
- Affordable (in terms of designs as well as availability of water) and cost effective technical solutions with necessary modifications and adaptations in technical standards to be consistent with cultural sensitivities of specific communities will be identified and marketed.
- The component sharing model as envisaged in the National Sanitation Policy will be
- Institutionalized gradually in which the community is responsible to construct lane and
- Neighborhood level sewers (internal development) on self-help basis and the government focuses on trunks, disposal and treatment unit (external development).
- The role of women shall be an integral component of behavioral change communication strategies and project planning, implementing and monitoring through capacity development and social mobilization of relevant stakeholders.

8.2.6 Strategic Development Plan

The aim of Strategic Development plan is Provision of adequate Sewerage and Drainage facilities to the DHQ Town through equitable, efficient and sustainable sanitation services. Lanes may continue using concrete drains and to discharge into sewers through screening chamber. Some of the objectives include:

i. Long Term Plan

- Gravity flow systems will be used for sewerage schemes so as to avoid pumping and O&M costs.
- Acquire Land & Provide Stabilization ponds for full treatment to produce acceptable quality of effluent for re use.
- Integrated water supply waste water treatment and disposal a schemes should be prepared with full treatment of waste water and use of effluent for agriculture and horticulture.
- The plan will focus mainly on the details of the trunk sewers, treatment and disposals and re-use options. All other sanitation related agencies (cantonments boards, railways, etc.) will develop their plans in accordance with the overall plan
- Wherever existing sewerage systems discharge untreated sewage in storm water drains or irrigation canals it should be treated before discharging, and may be used for agricultural purposes or converted into lakes and ponds as part of recreational areas.

ii. Short Term Plan

- Improving standards of public health through provision of improved services supported up by legal, regulatory and binding framework.
- To raise living standards of community by providing improved drainage and Sewerage services.
- Special focus on need based interventions in sanitation sector
- Priority for sanitation will be accorded to un-served, under-served areas, and disadvantaged areas.
- An overall sanitation plan will be developed for all urban settlements by city District governments and MCs in coordination with all other agencies involved in sanitation.
- Rehabilitation of existing drainage network.

8.2.7 Priority Projects

i. Repair & Rehabilitation of existing Sewerage and drainage network (69% of DHQ Town approx. 1458.22 acres)

➢ **Project Scope & Justification**

In Badin Town Sewage is mainly disposed of in roadside drains, and untreated sewage collects in ponds/ swamps. The drainage system and structures are in poor condition with open smelly drains and sewers. Drains are in poor condition almost in all the town and need to be repaied.

➢ **Project Size**

Project Size	
Population of Badin MC	112,420
Landuse of DHQ town excluding agriculture, vacant land & water bodies Area in Acres	2,339.7
Core Town Area in Acres	226.34
Remaining Urban Area in Acres	2,113.36
Repair and Rehabilitation of **existing Sewerage and drainage** served area 69% of DHQ town excluding agriculture, vacant land & water bodies and Core Town Area @ of one million per acre	1458.22

According to the landuse survey conducted by client, the total Landuse of DHQ town excluding core area, agriculture and vacant land & water bodies is about 2,113.36 acres approximately. According to socio economic survey results 69% (1458.22 Acres) of town area is served with drainage system. 80% of respondents from the town are dissatisfied with the current sewerage system. Therefore it is proposed to repair & rehabilitate existing drainage scheme for DHQ town on priority basis covering an area of 1458.22 acres excluding core town area. Repair & Rehabilitation of Primary and Secondary Drains will include the following components;

- Repair of Walls, bed and Top slab of drains, manholes and chambers
- Reconstruction of drains ,chambers and manholes where found completely damage
- Cleaning of pipes, chambers, drains and inlet gratings

- Laying of news pipes after replacement of old damage pipes

➢ **Project Benefit**

After the implementation of the project of surface drainage network with easy disposal to river/canals after the treatment, the risk of urban flooding will be mitigated.

➢ **Implementing Authority – PHED Government of Sindh, Badin MC**

➢ **Estimate Cost: Rs. 1458.22 million approx.**

ii. Installation of new Sewerage and drainage network for 31% unserved areas of the Badin MC (approx. 655.14 acres).

➢ **Project Scope & Justification**

As per socio-eocnomic survey results, 31% of total area of Badin DHQ town is unserved due to unavailability of drainage network.

Project Size	
Landuse of DHQ town excluding agriculture, vacant land & water bodies Area in Acres	2,339.7
Core Town Area in Acres	226.34
Remaining Urban Area in Acres	2,113.36
Installation of new Sewerage and drainage network for 31% unserved areas of the Badin MC (approx. 655.14 acres). Excluding agriculture, vacant land & water bodies and Core Town Area @ of three million per acre	1965.42

➢ **Project Size**

Therefore it is proposed to install new drainage scheme for unserved 31% area of DHQ town on priority basis, covering an area of 655.14 acres. The remaining area of the Badin MC needs to be provided a proper drainage and sewerage network in the town. This project will help the inhabitants of the town for easy disposal of storm water drainage and sewage water in to main drainage system. Construction of new drainage network will cover the following components;

- Repair of Walls, bed and Top slab of drains, manholes and chambers
- Reconstruction of drains ,chambers and manholes where found completely damage
- Cleaning of pipes, chambers, drains and inlet gratings
- Laying of news pipes after replacement of old damage pipes

➢ **Project Benefit**

After the implementation of the project, the area of the town which is missing the facility of the drainge network will be served.

➢ **Estimate Cost: Rs.3.00 million** per acre cost – Rs. 1965.42 million approx.

➢ **Implementing Authority – PHED Government of Sindh, Badin MC**

iii. Construction of Sewage Treatment Plant

- **Project Scope & Justification**

  Currently, waste water treatment in Badin DHQ Town is directly disposedoff by ten pumping stations located near Old Mir Wah Nala (Old Bhuda) pass through the central portion of the town and finally discharges into the sea through a SCARP drain.

  Due to unavailabilty of sewage treatment plant, the preference is given to conventional / Natural treatment of waste water through oxidation ponds. Therefore it is proposed to construct Sewage Treatment Plant for DHQ town on priority basis. Initially, construction of STP having capacity of **2.0 Million Gallon** is proposed on priority basis on land of four acres of existing lagoon located along seerani road. STP involves the process of pre and secondary treatment of waste water. The following components includes the process;

  i. Raw water screening
  ii. Grid removal
  iii. Oil and gas removal
  iv. Aeration Tank
  v. Sludge Separation & Treatment
  vi. Disposal of Sludge

- **Project Size**

  Initially, construction of STP having capacity of 2.5 Million Gallon is proposed on priority basis. And also procurement of land is required for treatment works on priority basis.

- **Project Benefit**

  After the implementation of the plan wastewater will be used for landscaping or maybe for other use.

- **Implementing Authority - Government of Sindh, Badin MC.**

- **Estimate Cost: Rs.350.00 million approx.**

S. No.	Project Name	Area (acres)	Estimated Cost In Millions	Short Term	Justification
Sewage & Drainage					
1	Repair & Rehabilitation of existing Sewerage and drainage network (69% of DHQ Town approx. 1,458.22 acres - excluding the core area)	1,458.22	1,458.22	**Short Term**	At the rate of 1.0 million per acre for overall Repair, Rehabilitation and construction of existing scheme.
2	Installation of new Sewerage and drainage network for 31% unserved areas of the Badin MC (approx. 655.14 acres - excluding the core area).	655.14	1965.42	**Short Term**	At the rate of 3.0 million per acre for installation of new scheme.
3	Construction of Sewage Treatment Plant (2.5 Million Gallon)	5.00	350.00	**Short Term**	Area reserved 5.0 acres, having capacity of 2.00 Million Gallons tentative cost for overall construction.

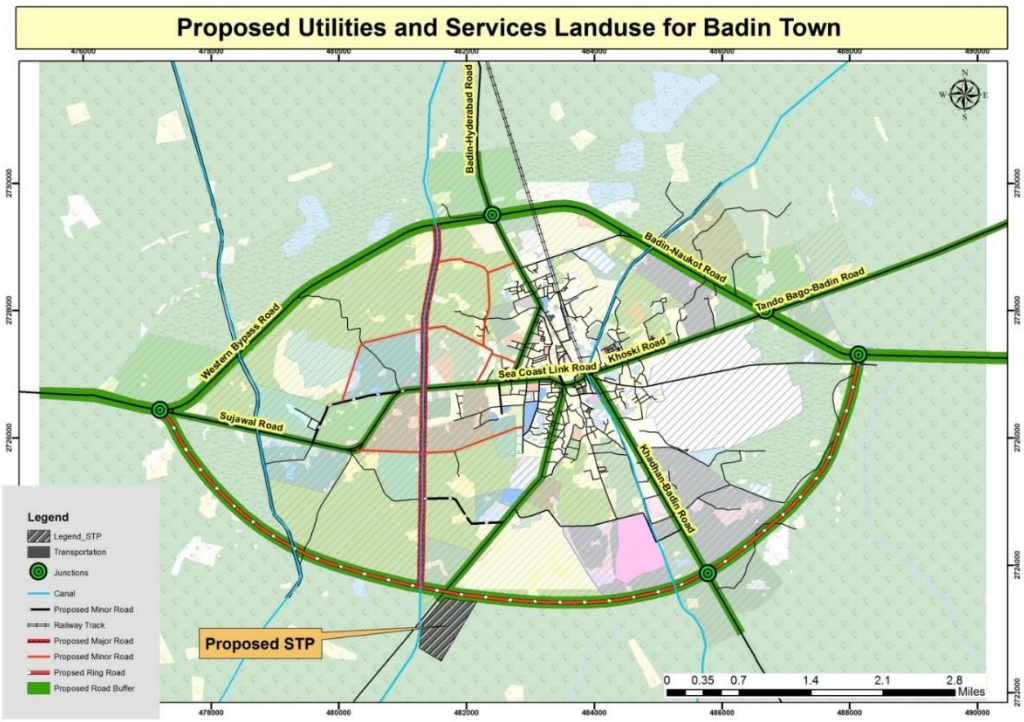


Figure 8:7: Proposed STP for Badin Town

8.2.8 Immediate Action Plan for Core Urban Area

i. Repair & Rehabilitation of Sewerage and Drainage Network Core Town Area

During the survey the residents complained that, the design of existing drainage network is not fulfilling the present demand. And old sewerage line which had burst several times within one year. So therefore it is proposed to repair & rehabilitate existing sewerage & Drainage network of core town area.

S. No	Name	Area (acre)	Per acre cost (PKR) million	Cost (PKR)
Total Core Urban Area : 226.34 Acre				
1	Sewerage System	**226.34**	**1.44 million Per acre**	**326.97**
2	Storm Water Drain System			
			Total Cost (PKR). Million	**326.97**

Note:

- ✓ Sewerage system includes all urban core area network system with all related machinery and equipment.
- ✓ Storm water drain system includes all the coverage core town area storm drain system through all steeps slopes and peak areas with all linking equipment and machinery.

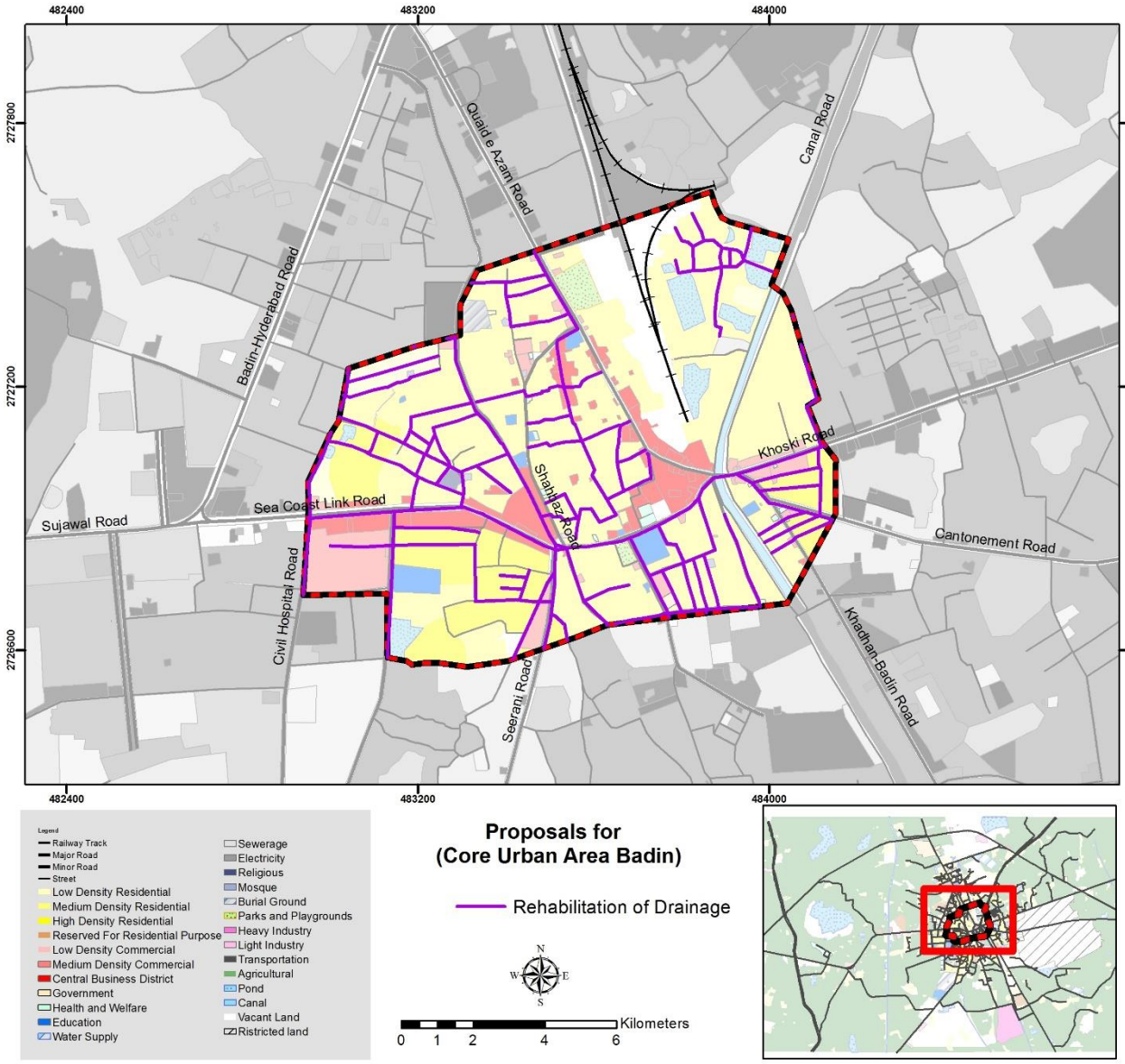


Figure 7-9: Immediate Action Plan for Rehabilitation of Drainage Network of Badin Town

8.3 Solid Waste Management

8.3.1 Existing Situation

There are number of established active primary collection points. These are not permanent structures but rather empty corners or vacant places. Besides, every locality has got throw away sites in the form of depressions, empty areas, cuttings areas etc. These types of non-designated points if come in the collection route are often served by the municipality staff but usually avoided due to shortage of time and resources constraints. Solid Waste that is collected from streets and roads etc. by sanitary workers is transferred and transported to the outside limits of the town. The following designated six disposal stations are collection points for garbage in the town:

- Cantt Road
- Bhatti Mohalla
- Kazi wala Railway
- Agrovel Colony
- Haji Hashim Khaskheli
- Main Drainage Disposal

The collection mechanism that exists in Badin is primary collection system. Collection from streets by sanitary staff and sweeper is by means of hand trolleys and transfer/ transport of garbage to outside limits of town is carried out through tractor trolleys which are inadequate in numbers for handling of MSW. Total actual numbers of Sweepers /and Cleaning staff is 137. The employed staff in the municipality is 371 in numbers and the sanctioned employees are 498 in numbers.

The equipment, machinery and vehicles presently in possession with the municipality are:

1. Tractors 03 Nos.
2. Loader 01 No.s
3. Diesel Dewatering Machines 08 Nos.
4. Petrol Dewatering Machines 12 Nos.
5. Electric Pumps & Motors (Drainage) 08 Nos.
6. Fire Tenders 02 Nos.

The vehicles and equipment required by the municipality is as follows:

1. Tractors 02 Nos.
2. Pump and Motor (100 hp) 01 Nos.

8.3.2 Waste Generation

The waste generation rate estimated from the studies conducted earlier based on NRM suggests being around 0.4 – 0.45 kg per capita per day[32]. However, it is recommended to undertake the field study for the determination of waste generation and characterization for Badin to plan and design the solid waste management system. Considering the waste generation rate for design purposes as 0.45 kg per capita per day with the current (2017) population of the municipal committee of Badin as 112,420, the total municipal solid waste load is approx. 50,589 kg or 50.59 tons per day.

8.3.3 Identification of Disposal Points

There are several established active primary collection points. These are not permanent structures but rather empty corners or vacant places. Besides, every locality has got throw away sites in the form of depressions, empty areas, cuttings areas, etc. These types of non-designated points if coming in the collection route are often served by the municipality staff but usually avoided due to a shortage of time and resources constraints.

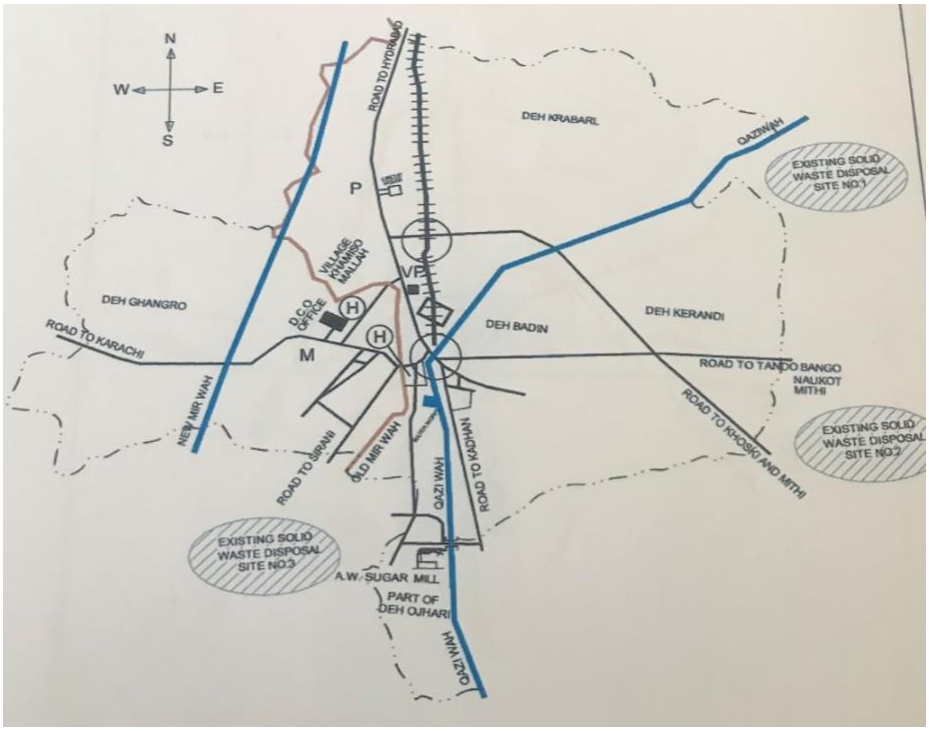


Figure 8:8 : Location of Solid waste Disposal Sites in Badin

Solid Waste that is collected from Streets and Roads etc. by sanitary workers is transferred and transported to the outside limits of the town. There are three dumping sites for solid waste as shown in map:[33]

8.3.4 Issues

Some of the major issues faced by MC are as follows:

- Shortage of machineries and equipment
- Lack of properly organized waste Collection System
- Arrangement of segregation, collection and disposal of infectious hospital waste
- Segregation of Organic waste from Municipal Solid Waste (MSW) and Treatment

[32] SCIP-03 Program Management, Project Preparation and Implementation Support for Planning & Development Department, Solid Waste Management Studies of Towns of Central Cluster of Province of Sindh, 2013, Brisbane City Enterprises Pty Ltd, & MMP
[33] Data provided by MC Badin

- Safe disposal of hazardeous waste in an environmentally sustainable manner
- Directives for implementation of waste policy framework and execution of its management system.

There are no special arrangements for the handling, storage and disposal of clinical or hazardous waste except for the breaking of needles and their collection. Hospital waste is internally collected and disposed of by the hospital sweepers. No records are kept of where waste is buried as this is at discretion of the sweeper. It is estimated that healthcare waste arising from different healthcare facilities in the Badin are almost reaching half-ton per day which needs proper management and disposal.

The disposal of untreated municipal and industrial effluent into water bodies wreaks havoc for water quality especially near and downstream from the outfall points. Pulp and paper, textile, fertilizer, cement and sugar factories are responsible for this pollution. In this context, the problem in Badin is caused by the sugar industry. This is damaging the aquatic system and also reducing revenues from fisheries, causing diseases and contaminating groundwater.

8.3.5 SWOT Analysis

Solid Waste Management			
Strength	**Weakness**	**Opportunity**	**Threats**
1. Municipal Corporation is responsible for operating mechanism for solid waste management 2. System in place with improving efficiency, there is a slightly improvement in garbage collection and allocation of landfill site to dispose of toxic waste 3. Recycling by scavengers 4. The collection mechanism that exists in Badin is primary collection system	1. Poor financial and operational management system 2. District Badin has no proper solid waste management system 3. There is no system to identifying toxic wastes produced by various activities. 4. Communities' particularly low income groups are not aware with disposal procedures 5. Mixing of solid waste disposal into sewerage and drainage	1. Appropriate measures should be adopted for collection and re-cycling of MSW 2. SWM recycling will help to generate revenue 3. More landfill sites should be identified for future disposals 4. Establishing of a secondary collection system would add more revenue resources. 5. Opportunity for recycling and reuse of solid waste, such as RDF, bio-gas etc. 6. PPP in service delivery	1. Nuisance causing poor aesthetic 2. Poor public health 3. Threats to plants and animal life

8.3.6 Need Assessment

The waste generation rate estimated from the studies conducted earlier in SCIP-3 project suggests to be around 0.4 – 0.45 kg per capita per day[34]. However it is recommended to undertake the field study for the determination of waste generation and characterization for Badin in order to plan and design the solid waste management system. Considering waste generation rate for design purpose as 0.45 kg per capita per day with the current (2017) population of the municipal committee of Badin as 112,420, the total municipal solid waste load is approx. 50,590 kg or 50.6 tons per day. Taking population to be 207,361 in 2037 the landfill area works out to be 20 acre.

8.3.7 Policy Guidelines[35]

Implement integrated solid waste management with 100% coverage in urban areas and 60% in rural areas of Sindh by 2025.

Principle

- Develop integrated solid waste management system.
- Conduct a study on wastewater and solid waste to develop town level profiles (including Infrastructure, equipment and staffing)
- Conduct waste characterization studies.
- Smooth and efficient Solid waste collection and disposal by providing door to door collection services.
- Ensure Effective solid waste management by developing a list of staffing, hardware and equipment for solid waste management.
- Efficient Solid waste disposal and recycling by establishing transfer stations to reduce disposal time.
- Recycle solid waste by systematic separation.
- Sanitary landfill options identify for towns where it is feasible.
- Formalize contracts with companies for waste to energy options. At least each mega/intermediate city has a WTE (Waste to energy options) in place.
- Provide each town with a centralized and functional high risk hospital waste disposal facility.
- Update status of all slaughterhouses (recognized and unrecognized) in each district and prioritize those for rehabilitation, solid waste and wastewater management.
- Provide refresher training on slaughterhouse safety and hygiene practice guidelines to 100% slaughterhouse staff in recognized slaughterhouses in safe handling and disposal of carcass, entrails, hides, and wastewater.
- Efficient and effective management of Industrial solid waste by determining the current status of industrial solid waste production and disposal and development of strategies and actions for efficient and effective management of industrial solid waste.
- Develop and use technologies that are affordable, applicable and cost effective to maintain the solid waste management.

[34] SCIP-03 Program Management, Project Preparation and Implementation Support for Planning & Development Department, Solid Waste Management Studies of Towns of Central Cluster of Province of Sindh, 2013, Brisbane City Enterprises Pty Ltd, & MMP

[35] Solid Waste Management Policy for Sindh
Sindh water and sanitation policy 2017

- SWM program and projects will be coordinated with settlement planning, housing, environment, health and education policy guidelines, program and projects.
- Allocation of proper landfill sites outside of the urban area and Final disposal of waste at least 500m from housing to a contained area chosen and designed according to geological conditions, water table, wind etc.

8.3.8 Strategic Development Plan

The aim of this strategic development plan is to improve the quality of life of the people of DHQ Town and the physical environment and also provide guidelines for the management of solid waste in the town.

i. Long Term Plan

- **Community and Private Sector Involvement in SWM:** The active involvement of local communities and the private sector is essential for an effective waste management system. It would be beneficial to start involving local communities and the private sector in waste management, which has been a slow process. This process needs to be accelerated in a well planned manner.

- **Public Awareness and Education:** It can be brought about in many different ways through the electronic and printed media and street talks, through community organizations such as schools, institutions, and households, using a public-address system, distributing leaflets, for public awareness.

- **Encourage On-site Reuse and Recycling:** This method will reduce material consumption and the quantity of hazardous waste generated. As a result, material cost and waste treatment cost will be reduced.

- **Implement Waste minimization:** It is done through pilot and demonstration projects. These pilot and demonstration projects can be used to raise awareness of basic waste-minimization measures.

ii. Short Term Plan

- The collection and disposing of solid waste is the responsibility of the Badin MC. The mechanism for solid waste management is not available in Badin therefore a detailed feasibility is proposed to develop an efficient solid waste management in Badin town.
- The collection system needs to be made more effective and efficient.
- MC has already initiated some work on biomedical-waste management. It should immediately start segregation practice for biomedical waste collection system.
- Techno-economic feasibility and detail study of characterization of waste is proposed on basis of the policy guidelines.

- Develop integrated solid waste management system keeping in mind the method, procedure and design at front end, middle end and back end, based on best possible public health practices and environmental protection laws/rules.
- Industrial waste disposal should be treated seperately and safely.

8.3.9 Priority Project

i. Feasibility Study for Solid Waste Management Mechanism

- **Project Scope & Justification**

The collection and disposing of solid waste is the responsibility of the Badin MC. The mechanism for solid waste management is not available in Badin DHQ Town so therefore a detailed feasibility is proposed to develop an efficient solid waste management in Badin DHQ Town.

Central Composting Plant: In order to handle a large quantity of waste it is essential that organic waste is segregated from the municipal solid waste (with possible recovery of recyclable items) for which a set up of large-scale central composting plant is required. This should be done with private sector participation.

Note: However, a Feasibility study is required for the designing and costing of the project.

Landfill Site: Landfill is an ultimate safe disposal option for Municipal Solid Waste and is imminently required. Land fill should be in the radius of 4-5 km of the town

- **Project Benefit**

This project will help to find feasible solution to provide efficient mechanism of solid waste management and also help to improve the health conditions of the town which are causing un-hygienic due to un-availability of solid waste management in the town.

- **Implementing Authority -Government of Sindh, Badin MC**

- **Estimate Cost: Rs.60.00 million approx.**

S. No.	Project Name	Area (Acres)	Estimated Cost In Millions	Short Term	Justification
Solid Waste Management					
1	Feasibility Study for Solid Waste Management Mechanism	2,113.36	20.00	**Short Term**	At the present, the town lacks in the provision of integrated mechanism of municipal solid waste management.
2	Procurement for land acquisation process for Landfill Site (10 acre).	10.0	40.00	**Short Term**	At the rate of 4.0 million per acre

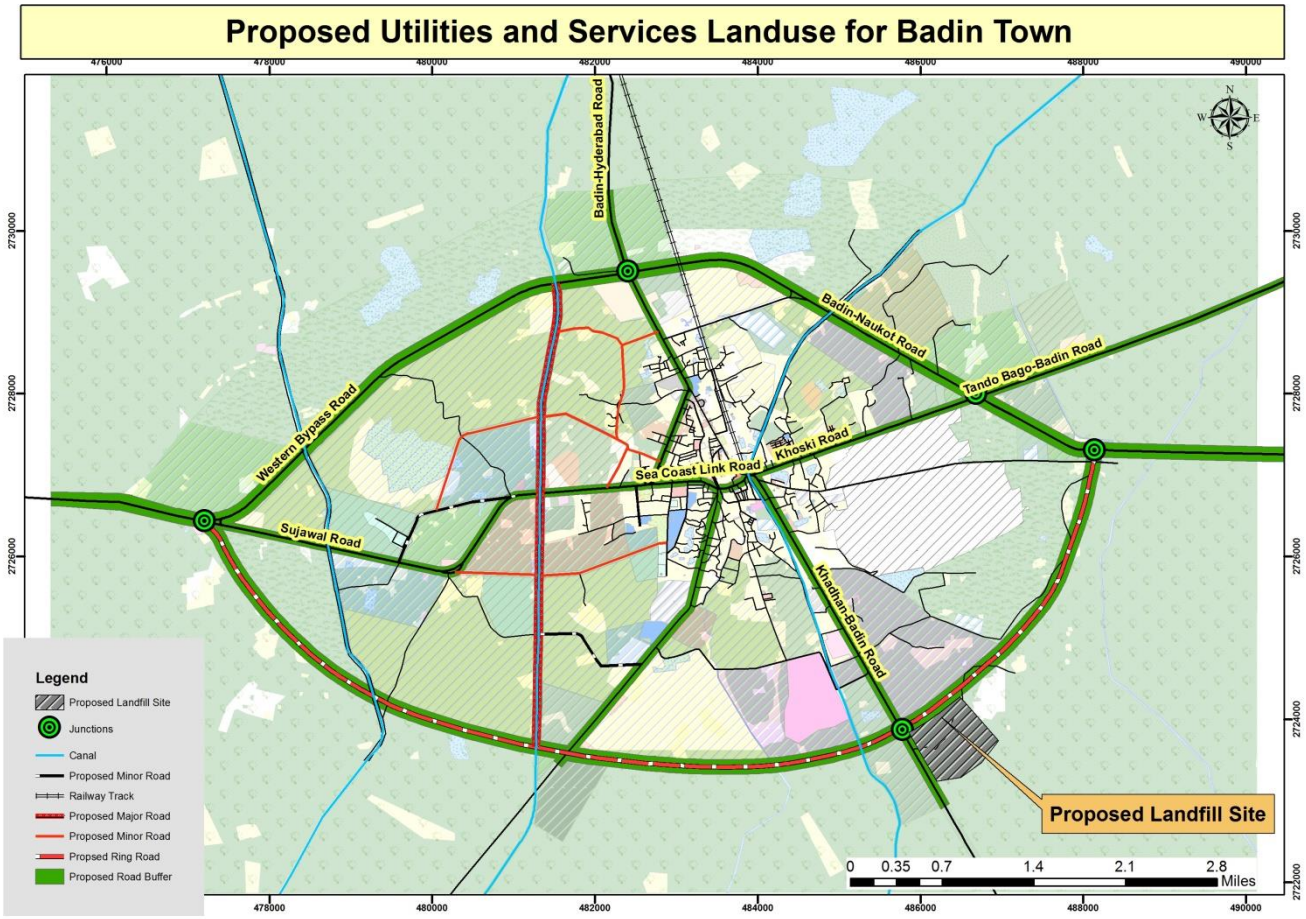


Figure 8:9: Future Land uses Reserved for Proposed Landfill Site for Badin Town

8.3.10 Immediate Action Plan for Core Urban Area



The waste generation rate estimated from the studies conducted earlier suggests being around 0.4 – 0.45 kg per capita per day[36]. However it is recommended to undertake the field study for the determination of waste generation and characterization for Badin MC in order to plan and design the solid waste management system.

Solid Waste Generation

The waste generation rate estimated from the studies conducted earlier based on NRM suggests being around 0.4 – 0.45 kg per capita per day37. However, it is recommended to undertake the field study for the determination of waste generation and characterization for Badin to plan and design the solid waste management system. Considering the waste generation rate for design purposes as 0.45 kg per capita per day with the current (2017) population of the municipal committee of Badin as 112,420, the total municipal solid waste load is approx. 50,589 kg or 50.59 tons per day.

However, it is highly proposed to introduce recycling of reusable items and segregation of solid waste into paper, plastic and glass from household level. These could be achieved from awareness campaigns and installation of segregated bins at Mohallah level.

- **Suitable locations for Disposal Points**



There are number of recognized / established active primary collection points in the town. These are not permanent structures but rather empty corners or vacant places. Besides regularly served designated collection points, every locality has got throw away sites in the form of depressions, empty areas, cuttings areas etc. These types of non-designated points if come in the collection route are often served by the municipality staff or usually avoided due to shortage of time and resources constraints.

Specific information regarding, generation of Solidwaste specific to core urban area is not available. That's why below map is showing tentative disposable points for collection of solidwaste.

[36] Consultants Estimates

[37] SCIP-03 Program Management, Project Preparation and Implementation Support for Planning & Development Department, Solid Waste Management Studies of Towns of Central Cluster of Province of Sindh, 2013, Brisbane City Enterprises Pty Ltd, & MMP

Badin Core Town Area - Solid Waste Management System (Solid Waste Garbage Collection Containers)				
S.No	**Name**	**Containers No.s**	**Cost / Container**	**Cost (PKR)**
Total Core Urban Area : 226.34 Acre				
1	Placing of Garbage Container at different sites/locations in core town area	60.00	520,000.00	**31200000.00**
			Total Cost (PKR). Million	**31.20**

Note:

- Each site located for garbage container must be strictly followed by MC to collect and manage solid waste from this site for proper management of the core area.
- Containers must be fully get maintained by MC office.
- Sindh solid waste management department/authority should kept control on each project for the uplifting of town as per master plans.

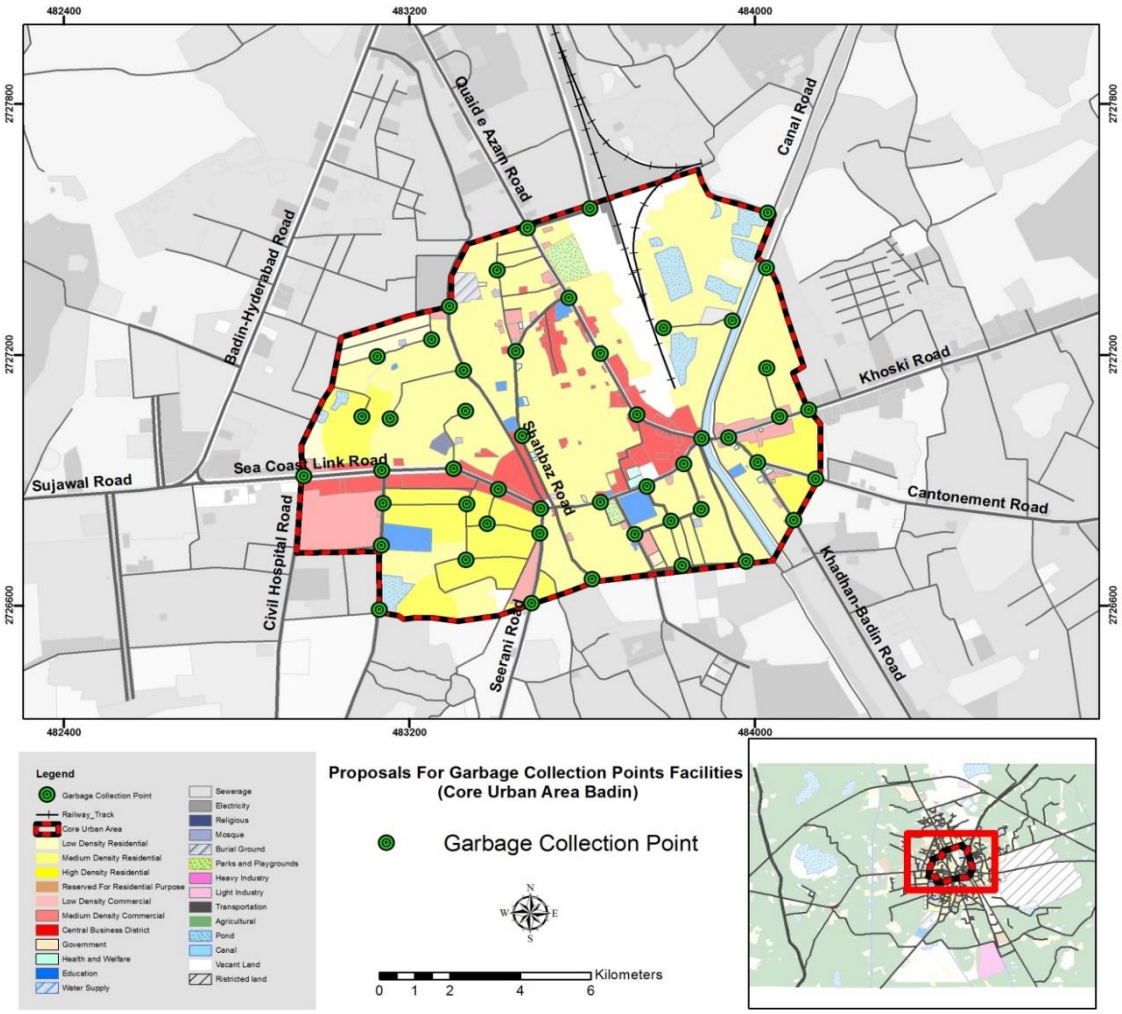


Figure 8:10: Location of Solid Waste Collection Points

8.4 Firefighting

8.4.1 Existing Situation

Currently there is one fire brigade station situated in Badin with 14[38] firefighting staff and two functional firefighting vehicles. The Municipal committee Badin has no separate budget for firefighting and no vehicle maintenance facility in town.

8.4.2 Need assessment

As the current total population of Badin Town is 112,420, which will be 207,424 in 2037. As per National reference manual the one fire station is recommended for 0.1 million population and one fire engine is required for 50,000 population. Currently there are 2 vehicles are available with municipal committee. So two more vehicles are needed for Badin Town.

8.4.3 Strategies

- City committee people would need to be trained about local early warning systems, evacuation, first aid search and rescue, firefighting etc.
- Provision of Sprinkler protection should be ensured in each multi story building for firefighting.
- Assure that all areas of the Town have the highest level of fire protection, at the lowest possible cost, to meet existing and future demand.
- Establishment of fire-stations to accommodate required number of fire vehicles.
- Establish sub-stations at different locations to ensure short response time for the whole city.
- Increase service efficiency through number of vehicles, dedicated staff and financial mechanism.
- To ensure readiness of all vehicles with ample stocks of POL and spares.

[38] MC office Badin

9. INFRASTRUCTURE

9.1 Transportation

9.1.1 Existing Situation

Badin has significant connectivity with surrounding towns as well as other parts of the country through the regional road network. There are 7 main Roads Networks, which connect Badin District to the rest of the country. According to the National Highway Authority, a total of 105 ongoing road schemes are in execution Badin district with the longest being Sujawal-Badin road with a length of 77 km. The main points of the road are Badin, Golarchi, Khorwah Chowk and Sajawal. According to the same source, the shortest road scheme in Badin is Manak Laghari has a length of 0.50 km.

Regional Connectivity (Air, Rail, Road)

- **Airport**
  The airstrip is located near Talhar city. It extends 28 km to the north of the Badin town with only 40 minutes' drive through the Badin-Hyderabad road. The Air trip is not functional for regular passenger flights.

- **Railway Station**
  A railway line links Badin with Hyderabad, which is about 96 Km (60 miles) Northwest of Badin. Only one train is in a week is operational.



Figure 9:1: Badin Railway Station

- **Inter City modes of Transportation (Bus and Truck Stand)**
  Inter-city buses are very limited and do not operate regularly. There is no proper bus stand but illegal bus and qinqui stands of public transport are evident everywhere. Some bus and truck stands are observed on the periphery of Badin, which connect Badin to other Towns. There is one bus terminal construction going on near the grid station.



Figure 9:2: Road Condition

- **Intra City Modes of transportation:**
  There are no major Bus and Truck stands within Badin. Unregistered Qingqi and Rickshaws are existing in large numbers.

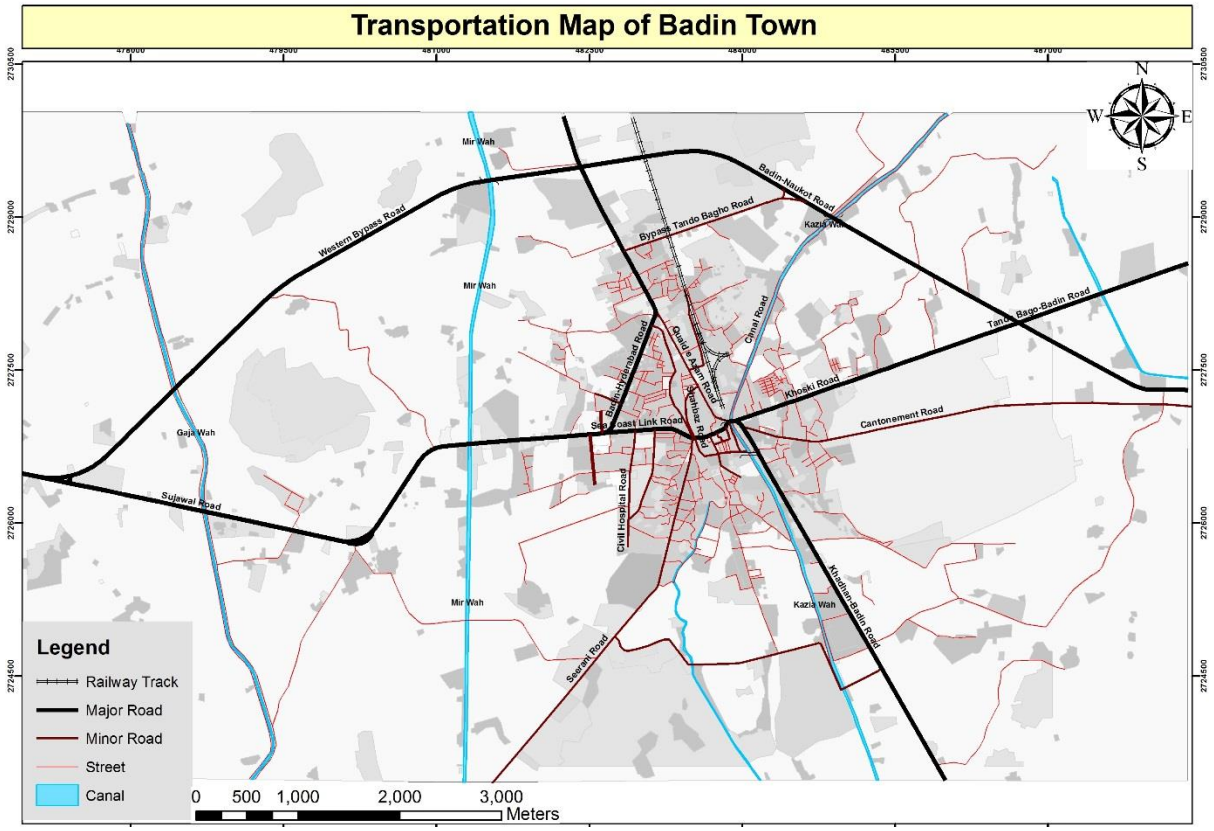


Figure 9:3: Transportation Map of Badin Town

Local Road Network

- **Condition of Road**

Badin is a small but important town in southern Sindh. Badin is situated at 93 Km (58 miles) east of Thatta, 98 Km (61 miles) west of Matli and 50 Km (31 miles) southeast of Tando Mohammad Khan. The Runn of Ketch is located at about 53 Km (33 miles) to the south of Badin. Badin is well connected with all these places by road. The road to Thatta runs westward up to Karachi. Total geographical area i.e. 6,726 square kilometers whereas the total length of roads of both primary and secondary types is, 2019 kilometers, the length of road per square km as per geographical area is 0.30 km which is insufficient.

Drainage issues on the roadside are evident due to which road quality deteriorates quickly absence of lane marking & signing is another issue due to which traffic accidents take place. Encroachments and unorganized/illegal Qinqui and Rickshaw stands are also evident on the roadside which causes on street and off-street parking issues. There is no traffic police or major roads nor there did any signalize intersection.

Table 9-1: condition of Local Roads

S. No.	Name	Condition	ROW (feet) Aprox.
1	Badin Sujawal Rd	Good	40
2	Badin Kadhan Rd	Good	30
3	Badin Seerani Rd	Good	30
4	Badin Naukot Rd	Under construction	-
5	Badin Tando Bago Rd	Good	40

Internal Roads

The internal road network of Badin town is not satisfactory with deteriorated physical conditions, encroachments on roads, congestion, roadside parking, and drainage issues. The main internal roads include Badin Serani Road, canal road, sugar mill road, Cantonment road, and civil hospital road.

Main Junctions

Main Junctions in Badin include Shanawaz chowk and Qazi Wah Bridge that have the same issues stated above for internal roads, with congestion of traffic a major issue.

Street Pattern

After the construction of the railway track in 1906, the city, initially expanded around the track. However, later on, with the construction of canals, the traditional linear growth pattern was disturbed, resulting in congested development and thickly populated areas with a haphazard street pattern.

The administrative complex and offices are situated along the major roads i.e. Badin-Sujawal Road, Tando Bagio Road, Hyderabad-Badin Road, and Badin-Seerani Road. Most public projects are established along the Badin-Sujawal Road, longitudinally, while commercial activities take place along both sides of the Badin-Sujawal Road. New development in the city is being developed on a grid.

Parking/Street Furniture/Street lightning

No separate parking is available except roadside parking. Similarly, no street furniture is observed. Street Lighting is available but needs to be upgraded and maintained where installed and as need extension in other areas as required.

9.1.2 Issues and Problems

- Tertiary and Secondary Roads are in very poor condition
- No formal Bus Terminal
- Traffic Congestion at intersections

- Unavailability of Traffic signals and street furniture
- Bad condition and shortage of Public Transport
- Lack of Road Safety measures
- Unregularized Qinqui system
- Drainage and parking issues

9.1.3 SWOT Analysis

Strength	Weakness	Opportunity	Threats
LAND USE & TRANSPORTATION			
Land Use Pattern & Transportation			
1. Mixed land uses (residential, commercial, industrial, administration) 2. Good national / regional connectivity through railway , air and road networks 3. Local public transport provisions is mostly by chingchis and auto-rickshaws 4. Strong network of inter and intra city transport 5. At most of roads sufficient ROWs are available for allied facilities	1. Unplanned street network 2. Presence of unregistered chingchi 3. Ribbon type commercial development in residential neighbourhoods. 4. Poor traffic management 5. Lack of integrated transport modes 6. Lack of coordination between different transport operating agencies 7. Lack of designated parking spaces causing haphazard street parking which reduces road capacity 8. Less provision of street furniture and non-aesthetic streetscape 9. Encroachments around bus bays and railway land sites	1. Promotes compact development with different activity centres to support local business 2. Opportunities in the form of wide roads available for mass transit system development 3. Wider road space can also be used to facilitate multiple transport mode with proper road space design 4. Proper management can promote public transport services. 5. With removal of encroachments adequate space available for traffic signs, lane markings, street furniture and foot paths 6. A new transport terminal for goods transport will facilitate supply of industrial goods.	1. Encroachments and on street parking (paid/unpaid) causing Traffic congestion 2. Inconvenience in mobility due to traffic congestion 3. Economic losses due to transporters strikes

Strength	Weakness	Opportunity	Threats
LOCATION & CONNECTIVITY			
1. Badin is well connected via Road and Rail network 2. There are three major connectivity of Badin: i. Badin - Mithi ii. Badin-Sujawal iii. Badin - Hyderabad 3. It is surrounded by rich agriculture land parcels which supports its agro based economy	1. Substandard public transport 2. Major connectivities are not equipped to accommodate full functioning 3. Rail functioning is limited due to less number of trains 4. For air link airport is far away	1. With an efficient transport network more agro based industries, regional fruit and vegetable markets, the distribution of different products could enhance the economy 2. Contribution in positive regional and local economic development 3. Good road connectivity could make airport easily accessible	1. Flooding could cause blockage of roads 2. Outdated good transit services may decline of trade and business activities 3. Expensive alternate transport modes

9.1.4 Policy Guidelines

- Decrease in private vehicles, especially during peak hours and in CBD areas.[39]
- Decrease in traffic delay.[20]
- Decrease/stability in air and noise pollution.[20]
- Involvement of private sector in transportation infrastructure and services projects.[20]
- Establishment of Mass Transit System.[40]
- Efficient operations and effective regulation of transport services.21
- Infrastructure development and up-gradation.[21]
- Integration of public transport services and networks.[21]
- Modernize goods transport and freight facilities.[21]

9.1.5 Sindh Empowerment of 'Persons with Disabilities' Act, 2018 41

Keeping in view 'Persons with Disabilities' act, 2018 while planning, designing & executing any kind of infrastructure projects i.e. public places, markets, parks, educational institutions, health facilities, Roads Street and pathways centers and etc, it is now mandatory to apply Universal Design

[39] Sustainable Urban Transport Policy-Sindh 2016

[40] ADP 2017-18 Transport Punjab

[41] For detail please refer; The Sindh Empowerment of 'Persons with Disabilities' Act, 2018 (https://depd.sindh.gov.pk/sindh-empowerment-of-persons-with-disabilities-act-2018)

and Accessibility criteria for ease of access of differentially abled persons. Also during the planning & designing phase universal guidelines for differently abled friendly construction should adhered for e.g provision of ramps, specialized tiles (Tactile Paving) used for visually impaired personals, signage, street furniture, foot path steps, parking, mechanical access, railings, opening of doors & windows, toilet design, lighting and illumination and etc.

Specifically planning & designing for the transport sector, universal access is the goal of enabling all citizens to reach every destination served by their public streets and pathway system. Universal access is not limited to access by persons using automobiles. Travel by bicycle, walking, or wheelchair to every destination is accommodated in order to achieve transportation equity, maximize independence, and improve community livability. Wherever possible, facilities are designed to allow safe travel by young, old, and disabled persons who may have diminished perceptual or ambulatory abilities. The universal design has following principles;

i. Universal access to destination:
   All destinations served by the public road system shall be accessible by pedestrians and by drivers of all vehicles (including bicycles), except that vehicle operation may be restricted for reasons of excessive weight, noise or size, or extraordinary potential for damage to property or person
ii. Equal Right of use:
   People's right to use that portion of a street designed for travel is not diminished by less weight, less size, or less average speed associated with their travel mode. Demand actuated tra-c signals must detect and serve a diversity of users including bicycle operators in the roadway and pedestrians using crosswalks.
iii. Accessible surfaces:
   To the extent practicable, travel surfaces should accommodate travel on foot with minimal trip hazards and via common assistive devices such as wheelchairs. Roadway surfaces should be as clear as possible of hazards for narrow tires such as bicycle wheels.
iv. Crossable Roadways:
   Crossing distances at non-signalized access locations must not exceed the distance that can be covered at walking speed before tra-c may arrive from beyond sight distance, or during reasonable gaps in roadway tra-c. Refuges provided to reduce crossing distances should be large enough to store assistive devices such as wheelchairs and strollers. Tra-c signal timing should provide adequate clearance intervals for safe crossing by pedestrians and slow vehicles.

It is suggested that necessary provision of the above recommendation may be mandated in the laws and regulations of SBEA and other agencies which drafting the buildings and highway regulations.

9.1.6 **Strategic Development Plan**

The aim of strategic development plan is to provide equal and equitable sustainable transport system to all groups of society on affordable basis with minimal impacts on environment; Provision of Citizen-centric, Sustainable and Growth Oriented Modern Transport system; and rehabilitation of existing roads.

i. Long Term Plan

- Satisfy mobility needs via integration of existing and planned routes, services and Infrastructure.
- Enhance institutional efficiency to improve service delivery.
- Implementation of Axle Load Management.
- Access Roads on both side of railway station.
- Rehabilitation and expansion of railway station with allied facilities
- Dualization of Link Road between Kadhan Badin Road and Badin NaukotRoad.
- Truck Terminal along Badin Naukot road
- Build a local / district / regional transportation system.
- Rehabilitation of existing roads should be scratched from its compaction level and reconstruct as per specification of design perimeters.

ii. Short Term Plan

- Create Traffic Engineering Bureaus (TEBs) at divisional level to perform functions as specified in Karachi Division (Traffic Engineering) Act 1985.
- Rehabilitation and Expansion of railway station
- Develop and implement modern route permit renewal and issuance system for local/regional public transport services.
- Improve road design to make safer roads.
- Remove and Prevent encroachments on footpaths and roads (in commercial areas)
- Environmental Impact Assessment (EIA) should be mandatory for all transportation projects.
- Declaring private vehicle free zones, especially in peak hours, in CBD areas to reduce noise and air pollutions.
- Reduce traffic growth and congestion by achieving a mode shift.
- Dualization of main arteries.
- Improvement of existing roads geometry.
- Undertaking improvements in road design and specifications.
- Rehabilitation of Farm to Market road network.

9.1.7 Priority Projects

i. Repair and Rehabilitation and Improvement of Major Roads, Minor Roads and Streets (excluding Core Urban Area)

➢ **Project Justification**

The condition of secondary and tertiary roads of Badin is in very poor condition. Due to un-availability of proper drainage network, the sewage water is damaging the roads. All the tertiary roads are also damaged due to sewage water. So it is proposed to improve and rehabilitate the roads of Badin.

However, the overall situation indicates narrow street width, poor pavement conditions, encroachments on footpaths and road sides, haphazard and illegal parking, open drains, lack of traffic signals and signs, etc. Space along with major roads is available for provision of missing facilities.

There is an unplanned & haphazard street network & absence of quality public transportation system in DHQ Town. Major roads & junctions i.e. Badin to Hyderabad Road, Quaid e azam Road, Badin-khoski Road, Tando Bago Road, Seerani Road, Shahbaz Road, Naukot Road, Costal Road, Kadhan Road & Golarchi Road needs repair rehabilitation with provision of allied missing facilities.

- **Project Benefit** – By implementation of the project agricultural, industry sector could be enhanced.

- **Implementing Authority**-Government of Sindh, Badin MC, Works and Services Department Badin

ii. Installation of Traffic Signals and new Solar Street Lighting on Main Roads

- **Project Justification**

Most of the Streets of Badin Town are without street lights in over all the town and all roads and are devoid of this facility. Street Lighting is essential for safe maneuvering of vehicles at night time and enhance sense of security of pedestrians on roads in dark hours. Given the energy crisis in the country, it is recommended to have solar street lights on streets and major roads.

- **Implementing Authority – Badin MC, Government of Sindh**

S. No.	Project Name	Estimated Cost In Millions	ADP	Non ADP	Status	
					Short Term	Long Term
Roads and Communication Network						
1.	Repair & Rehabilitation of Major & Minor Urban Roads (Excluding Core Urban Area) 18,000 meters with tentative RoW of 10 Meters @ rate of 4500 per running meter) 810 Million Repair & Rehabilitation of Streets (Excluding Core Urban Area) (Approx. 23,000 meters @ rate of 2,000 per running meter) 230 Million **Lump sum Amount 100.00/ Million** • Pedestrian pathways • Designated Parking Spaces • Provision of Footpaths and Street Furniture • Installation of traffic signals & new solar Street Lighting On main roads	1,140.00	-	Non ADP	**Short Term**	-

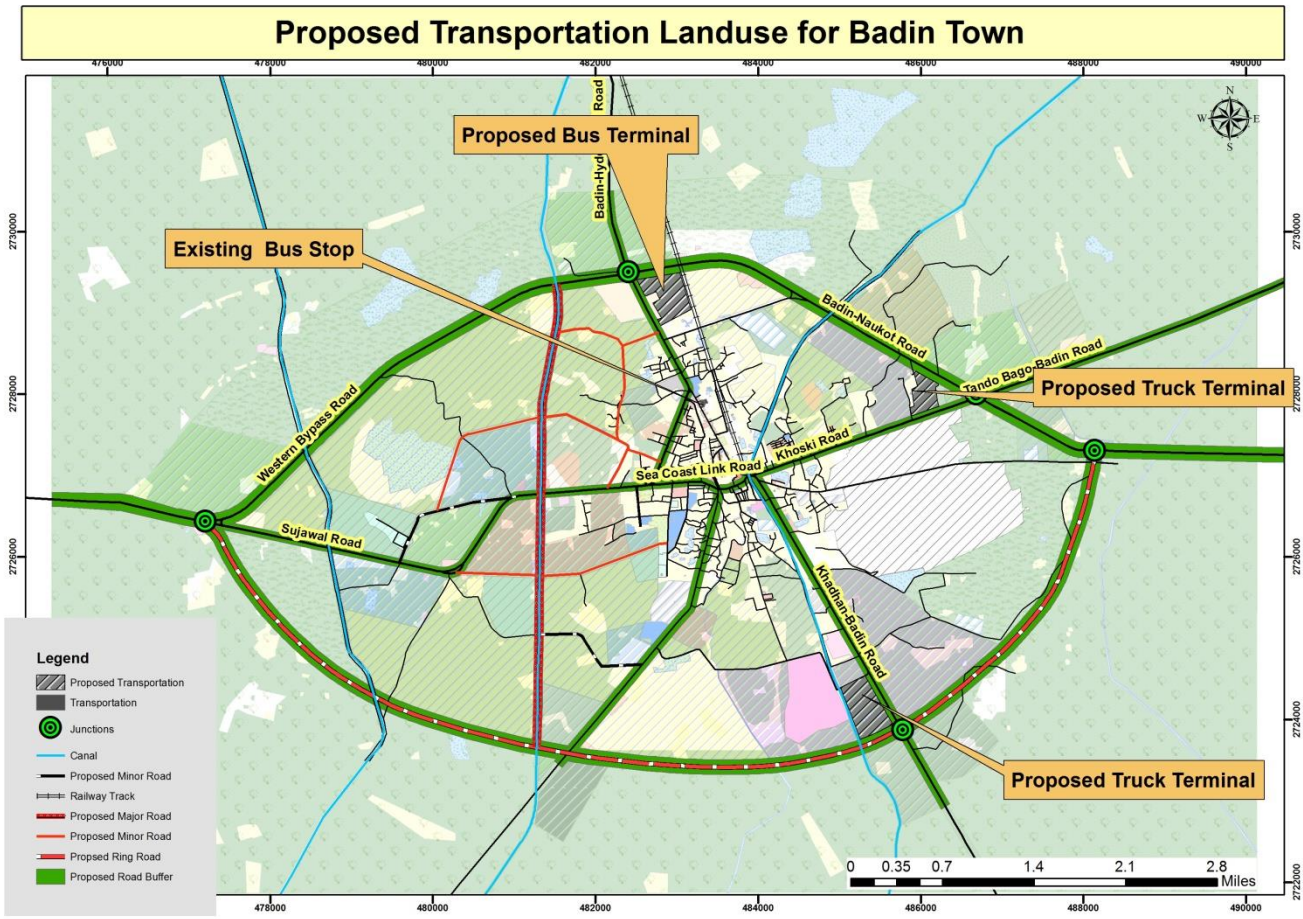


Figure 9:4: Future Land uses Reserved for Transport Works in Badin Town

9.1.8 Immediate Action Plan:

- **Dualization & Rehabilitation of Existing Roads**

Repair & Rehabilitation of major roads i.e. Shahbaz Market Road , Shahi Bazaar Road, main Quaid e Azam Road, Costal Road, Tando Bago Road, Kadhan Road and Cantonment Road. And minor roads includes; Seerani Road, Civil Hospital Road, Post office Road and Tando Bago Road etc.

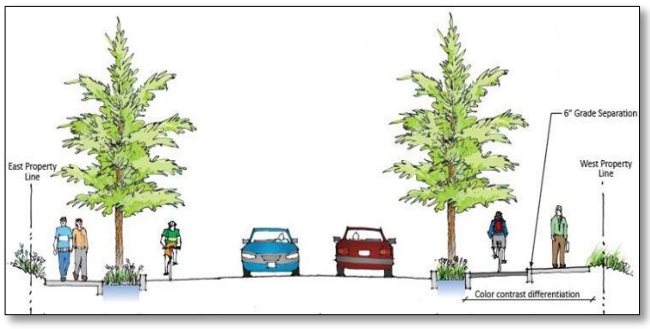
The improvement in road pavements with green medians, road markings, signals, pedestrian crossings, will be developed.



The main parameter for rehabilitation of existing roads is to draw a property line, which require very practical approach in such a way that no massive encroachment, destruction will happen. In this regard community participation will be highly needed to take them on board and to make awareness that this realignment is for the betterment of their area. Thus, the community ownership will make the idea workable, other than this forceful action will not work in long run.

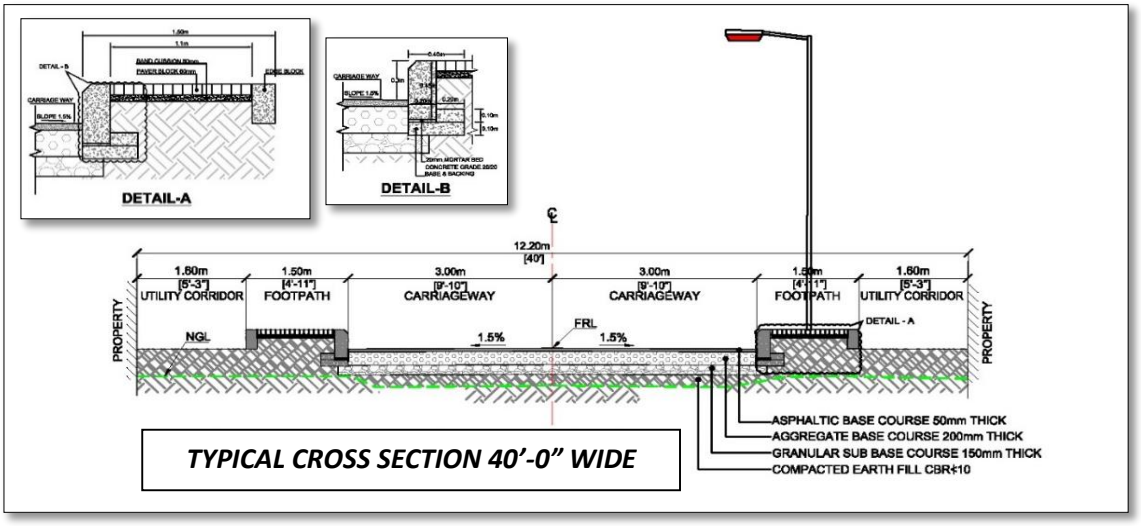
Immediate action plan for core urban area in Badin requires that the right of way of roads should be restored by removing all encroachments along the CBD roads.

The road pavements will be improved and tree lined medians will be developed on all main roads.

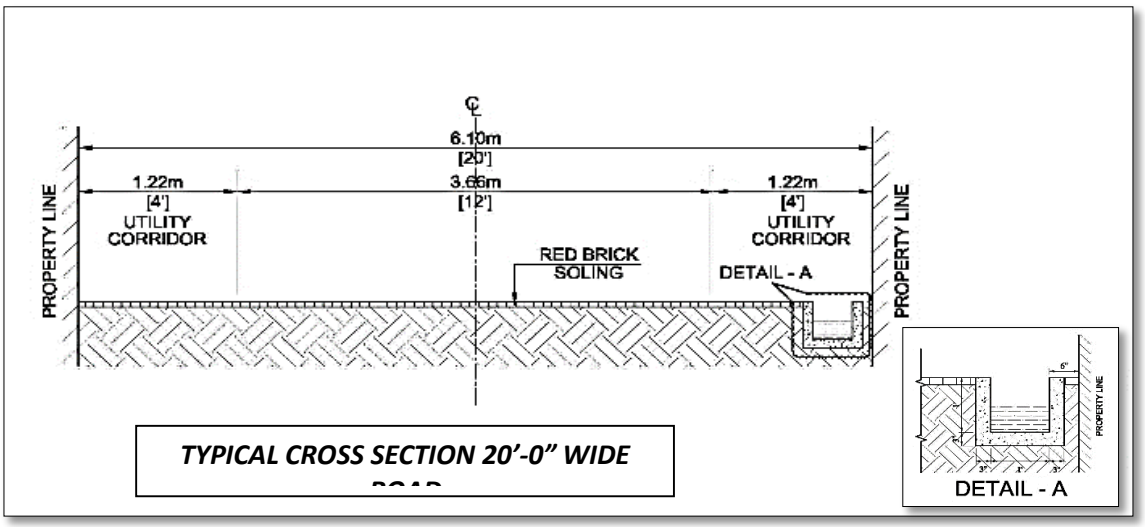


BADIN - CORE TOWN AREA - REHABILITATION OF ROADS								
S. No	**Area / Locality / Address Major Roads**	**Length (km)**	**Length (m)**	**Width (feet)**	**Width (m)**	**Area (sq.m)**	**Cost / sq.m (PKR)**	**Total Cost Millions (PKR)**
1	Repair and Rehabilitation of Quaid e Azam Road	1.38	1,380.00	40.00	12.20	16,829.27	4,500	75.73
2	Rehabilitation of Shahbaz Road	0.57	572.30	40.00	12.20	6,979.21	4,500	31.41
3	Repair and Rehabilitation of Sea Coastal Road	0.83	831.40	40.00	12.20	10,139.05	4,500	45.63
4	Rehabilitation of Cantonment Road	0.15	154.64	40.00	12.20	1,885.90	4,500	8.49
							Total PKR Rs. Million (A).	**161.25**
Minor Roads								
1	Repair and Rehabilitation of Tando Bago road	0.68	679.82	40.00	12.20	8,290.51	3,965	32.87
2	Rehabilitation From Tando bago road	0.20	204.78	40.00	12.20	2,497.36	3,965	9.90
3	Rehabilitation of Seerani Road	0.23	232.56	40.00	12.20	2,836.15	3,965	11.25
4	Rehabilitation of Civil Hospital Road	0.20	200.00	40.00	12.20	2,439.02	3,965	9.67
5	Rehabilitation of Khadan Road	0.27	267.11	40.00	12.20	3,257.39	3,965	12.92
							Total PKR Rs. Million (B).	**76.61**
1	Up-gradation of streets of Core Town Area Badin	7.00	7,000	20	6.10	42,682.93	2,000	85.37
							Total PKR Rs. Million (C).	**85.37**
							(REHABILITATION OF ROADS) - Total PKR Rs. Million (A+B+C).	**322.10**

Typical cross section is given as below;



TYPICAL CROSS SECTION 40'-0" WIDE



TYPICAL CROSS SECTION 20'-0" WIDE

Monuments

Repair, rehabilitation and beautification of Shahnawak Chowk is proposed on immediate basis.

Pedestrian Movement and Street Furniture

Pedestrian movement will be encouraged in core urban area by restoring footpaths on both sides of the roads in the city center. All existing encroachments on the footpaths should be removed to allow walkability in the city canter. Additionally some walkways should be designed in the CBD area by applying the pedestrianization policy there.

Provision of street furniture in the core urban area also needs immediate attention. Street lights, benches, footpaths restoration, traffic signals, zebra crossings and bus stops with shades should be installed on immediate basis.



Figure 9:6: Model of Footpath



Figure 9:6: Model of Walkway

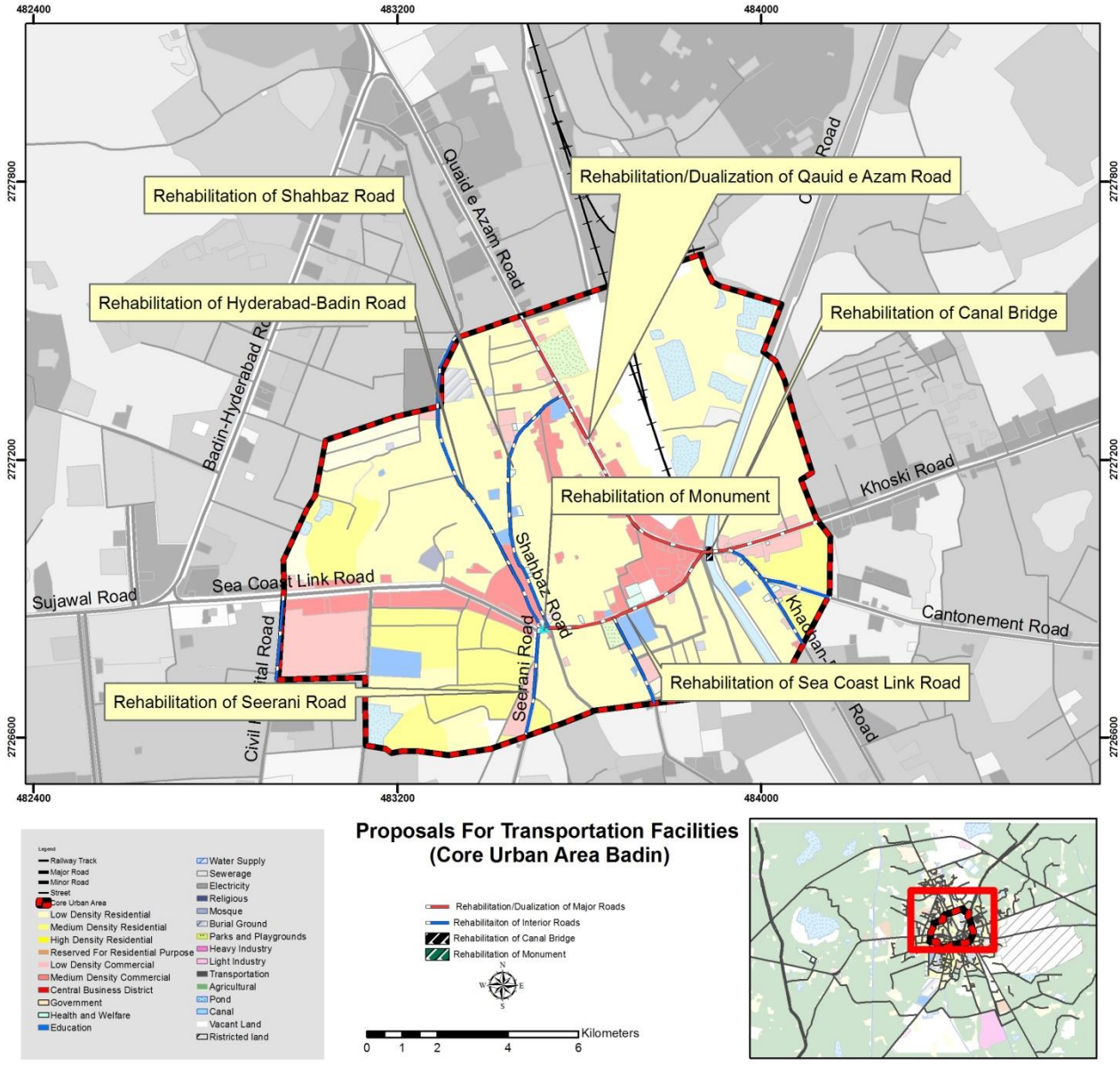


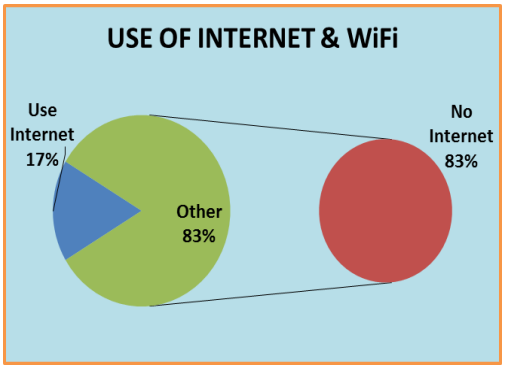
Figure 9:7: Repair & Rehabilitation & Improvement in Transport Facilities for Core Urban Area

9.2 Communication

9.2.1 Telephone, Mobile, Internet

PTCL, a government organization has the monopoly for lanline and satellite communication. PTCL network is spread in the entire city providing facility of telephone, internet as well as smart television. The PTCL main office is located on Cantt. Road.

During the socio-economic survey it was revealed that only 48 households have landline telephone and 570 households meet their needs using mobile phones, and public call offices are also found in the area. Mostly peoples are reported to be using cell phones and each adult in the house has his own cell phone which helps the resident's regular connectivity.



At present the internet usage is limited to educated families, with the decline of illiteracy rate. During survey it was found that only 110 households out of 634 are using internet and Wi-Fi system. The usage of smart mobile phone has also increased coverage to use internet facility provided by different service providers.



Communication Tower

There is also presence of press club, printing office and post office in Badin.

9.2.2 SWOT Analysis

Information & Communication Technology			
1. Strong networks available for advanced technologies, e.g. internet, cellular networks, broadcasting, satellite communication 2. All cellular service provider offer facilities and service station 3. Town is covered by PTCL services, station and network.	1. Lack of information sharing regarding agricultural activities, public health, veterinary, disaster forecasting etc. 2. The usage of internet and Wi-Fi is limited to less number of the population	1. Media can play important role in economic development and prosperity 2. Immediate disaster forecasting through disaster emergency response centre 3. Marketing campaign support of development initiative	1. Negative cultural and ethical exposure to young minds (youth), if not regulated properly 2. No check and balance of non-authorized/ non-biometric SIM's usage

Importance of Communication Infrastructure in Agriculture Sector:

Swift transportation facilities, farmer friendly marketing arrangements and, above all, a well-maintained Communication network are the basic requirements for an efficient and profitable agricultural sector. The District government needs to improve market and support service infrastructure including farm-to market Roads. This sector will need increased and sustained investments in communication infrastructure in rural areas.

9.3 ENERGY

9.3.1 Existing Situation

Like any other rural district in Pakistan, Badin is predominantly dependent on wood as a primary source of fuel for cooking with electricity being a major source of lighting. Statistics in the 1998 national census revealed that 76.29 percent of the housing units had electricity for lighting and 23.39 percent used kerosene for this purpose. The remaining 1.32 percent used other sources. In terms of fuel, 72.70 percent of the households used wood, 21.97 percent used gas, 3.92 percent used kerosene and the remaining 1.41 percent used other sources. There are no indications of planning and investment in alternative sources of fuel and energy. The existing tree cover cannot meet rising needs. The pressure on wood for cooking fuel is directly responsible for diminishing forests, which in turn affects agriculture, soil and above all the climatic balance in the district. Although fuel wood is imported into the district to meet current demands, existing poverty and poor management have led to widespread theft and illegal felling of this resource.

Electricity is supplied to only 678 out of 1,547 settlements, which makes only 44 percent of the total. Domestic connections have been provided to only 17,922 housing units out of the 22,000 *pucca* and semi-*pucca* units and a few of the 40, 986 *katcha* units of the district. The remaining 82 percent of the households use kerosene or wood for lighting.

9.3.2 Issues and Problems

- Advocacy efforts have not been made to promote efficient fuel use; consequently, there is little public awareness about fuel conservation measures,
- Alternative fuel sources are scarce and expensive. Liquid Petroleum Gas (LPG) and kerosene are available but costly, putting them out of the reach of the rural poor

9.3.3 SWOT Analysis

Strength	Weakness	Opportunity	Threats
Power Supply & Distribution			
1. Almost whole urban area gets coverage of electricity 2. Good recovery outcomes as business community in urban area want quality services. 3. The power supply is through HESCO-WAPDA transmission system	1. Shortage of electricity & power supply 2. Poor maintenance of electricity supply infrastructure 3. Power shortage due to non-payments of bills 4. Gap between demand and supply resulting in load shedding of electricity 5. Line losses and power theft 6. Outdated network in old town areas 7. Existing capacity of electricity supply is short to meet the growing demand of utility	1. By increasing the capacity of grid station will minimize electricity shortage & maximize production 2. Opportunities available for alternative energy production through solar energy and wind power 3. Renewal of outdated network to meet existing and future demand	1. Load shedding 2. Threat to agriculture and industrial production and overall economy 3. Political will and policies at work 4. Lack of any integrated and proactive planning to fulfil future needs

9.3.4 Strategic Development Plan

i. Long Term Development Plan

- The effective development of low cost energy production systems can be used to offset water scarcity by either deep drilling for freshwater or direct desalinization of brackish water.
- Success in achieving fuel efficiency, adopting new technologies and altering existing fuel-use
- Habits depends largely on women who are the primary users of fuel wood. They must be made aware of the long-term ramifications of adopting these innovations.
- Addition of sub stations as per requirement.
- Encourage energy efficient building construction.

ii. Short Term Plan

- Coastal areas of Badin are difficult and expensive places to reach with an electric grid. Wind energy can be utilized as a source of power generation for water pumping with the proper maintenance infrastructure in these areas.
- There is a good potential for harnessing solar energy for electricity production in the coastal areas. The average solar radiation over Karachi, Badin and Thatta is about 18 MJ/m2 per day and is greater than the world average (13 MJ/m2/day); thus the coastal area of Sindh lies in an excellent solar belt range.
- There is also a reasonably good potential for tidal energy in the coastal belt of Sindh. It can be converted into electrical energy with the help of turbines and generators. Generation of electricity using tidal power is very similar to hydroelectric power.

9.3.5 Priority Projects

- Upgradation of grid station
- Promote energy efficient appliances and devices
- Feasibility study for alternate energy sources (Solar, wind, biogas etc.)
- Provide LPG and domestic solar panels at subsidized rates to save tree cutting for fuel.

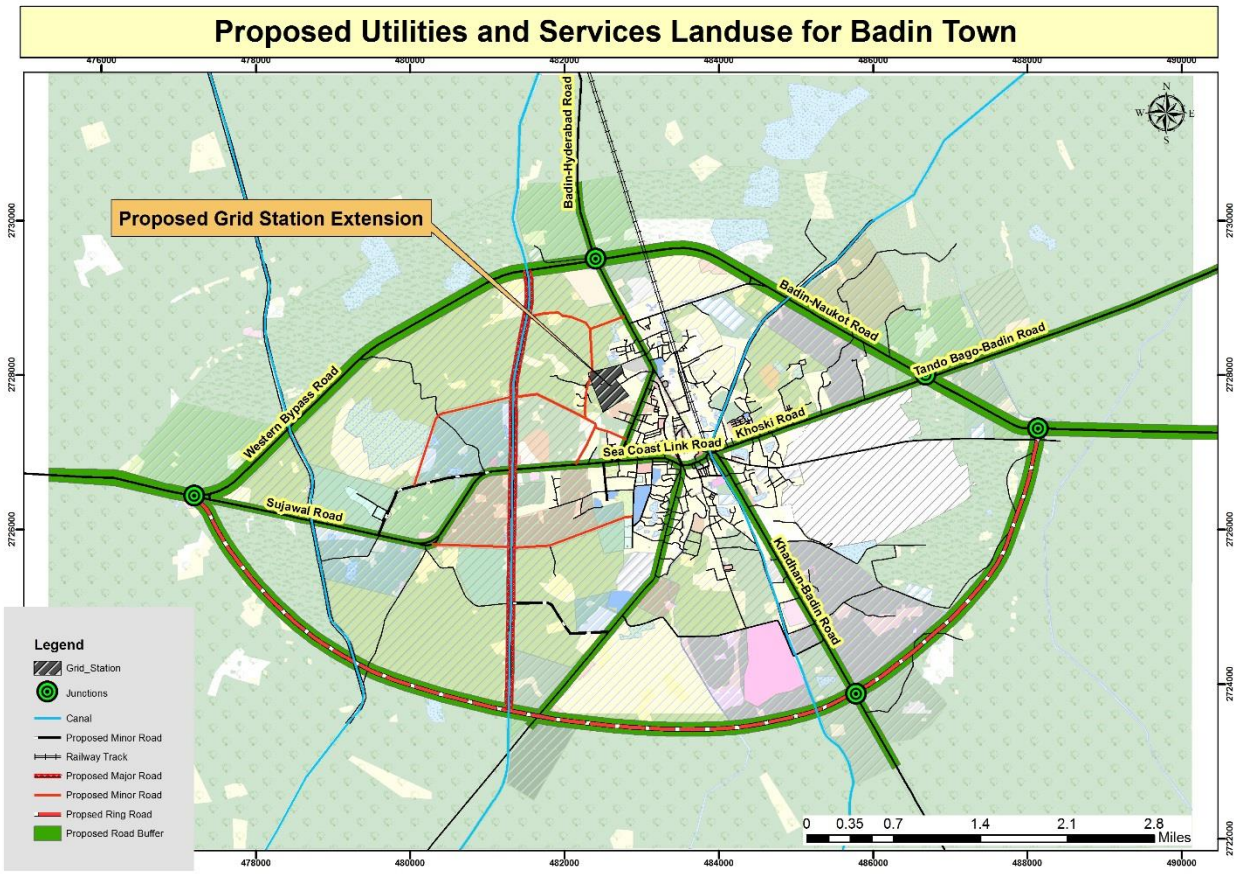
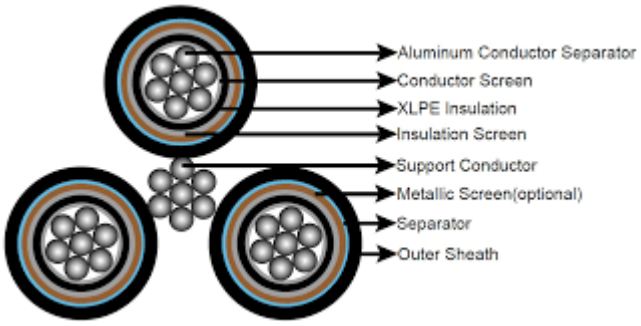


Figure 9:8: Proposed Gird Extension for Badin town

9.3.6 Immediate Action Plan

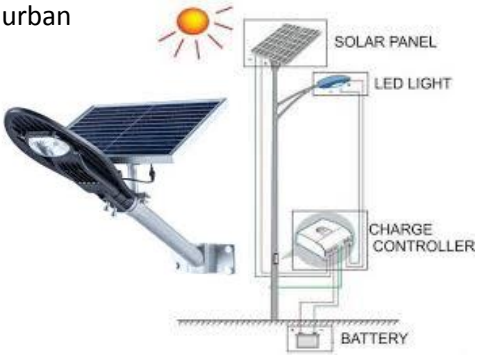
- **Arial Bundle Cable wires**

In present circumstances it is suggested that Arial Bundle Cable wires should be used to avoid short circuits and thefts issues. This will also increase the aesthetics and beauty of the core urban area.



- **Streetlights**

It is proposed to installed streetlight in all over core urban area. It is suggested to use streetlights with LED panel and solar power battery support. This can save energy and light can be lit even during the load shedding hours, but need regular maintenance. Considering narrow street and road width, it is recommended to use wall mounted poles in narrow streets, while floor mounted poles on other roads.



Promote energy efficient appliances and devices.

Proposed Wall Mounted Street Lights				
S.No	**Name**	**length (m)**	**length (feet)**	**Cost (PKR)**
1	Proposed Total Length of Street (km) for wall mounted streets lights.	10.00	32,800	8,200,000
			Total Cost (PKR). Million	**8.20**

- Wall mounted street lights approximately should be placed on distance of 15 to 20 feet apart.
- Each wall mounted street light cost (Rs. 5000/-).
- As per total length of Streets for this proposal 1,640 No.s of street lights/wall mounted streets should be placed in core town area.
- Operation and maintenance is the 1st priority to ensure after installation of all equipment's and machinery and kept under strict control of TC office for proper usage of facilities.

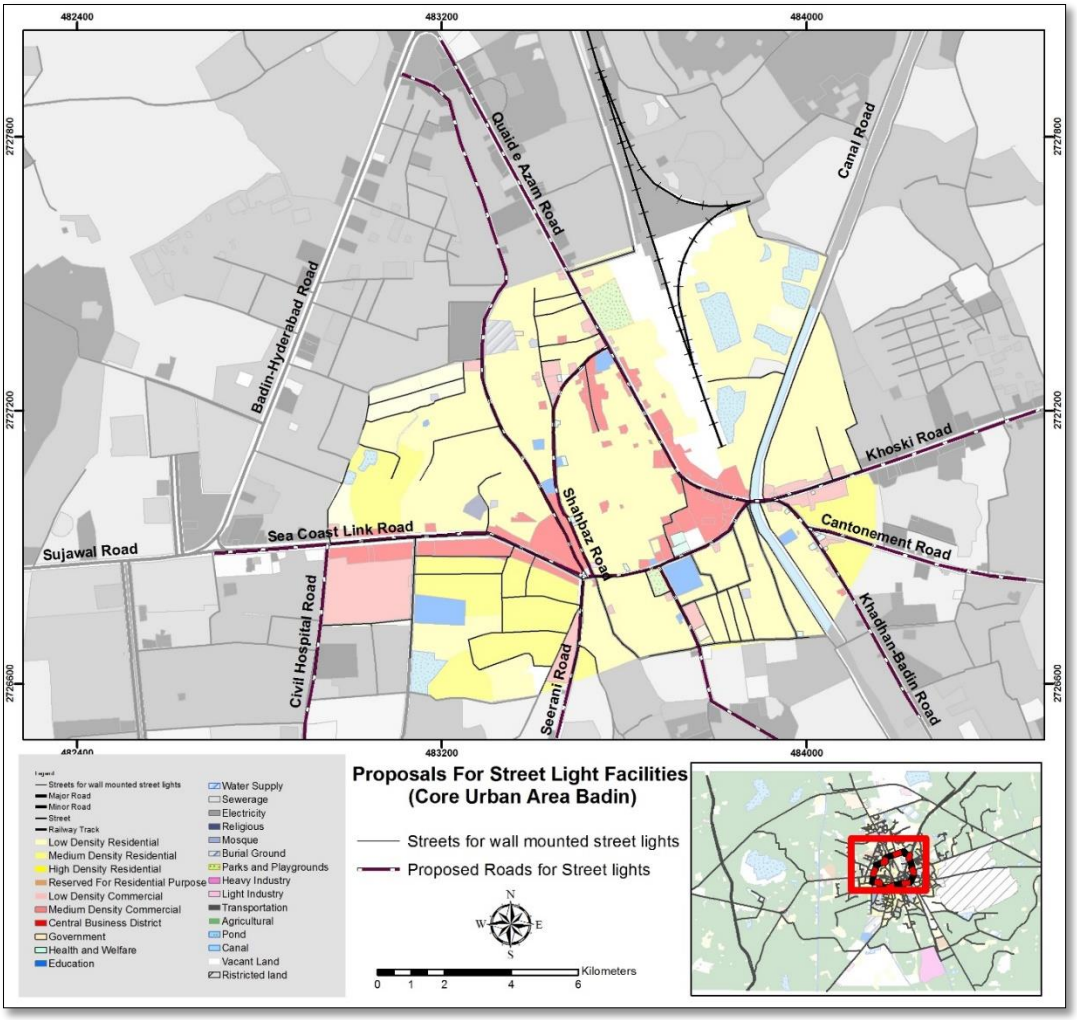


Figure 9:9: Proposal for Street Lights for Core Urban Area

9.4 Gas Supply:

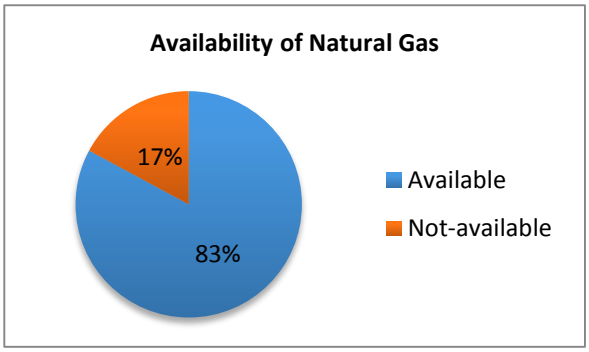
9.4.1 Existing Situation

Presence of Gas

623 house residents responded to the questions on availability of Gas. As given in the Table below, 516 houses had gas available to them, while the gas was not available to 107 houses. Therefore about 81% households have gas supply by SSGC and 19% were using alternate source of fuel for their daily household needs.

Availability of Natural Gas	No. of Respondents	Percentage
Available	516	81%
Not-available	119	19%
Total	**625**	**100%**

Source: Consultant's Survey, July 2017

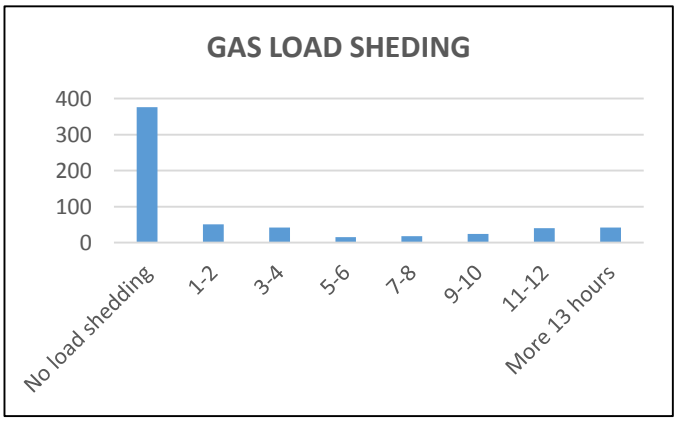


19% Households are using alternate sources i.e. wood, LPG and Kerosene oil.

9.4.2 Sufficiency of Gas Pressure

Around 75% of the households have complained about low gas pressure for 5-6 hours a day low gas pressure, whereas 25% of the households are satisfied with the Gas pressure.

Daily Load shedding Hours	No. of houses	Percentage %
No load shedding	376	62%
1-2	51	8%
3-4	42	7%
5-6	15	2%
7-8	18	3%
9-10	24	4%
11-12	40	7%
More 13 hours	42	7%
Total	**608**	**100**



Source: Consultant's Survey, July 2017

9.4.3 Strategic Development Plan

- Feasibility study for alternate resources available
- Measures to cater Load Shedding of both electricity and gas.
- Measure to appropriately priced the energy resources

10.ENVIRONMENT

10.1 Existing Situation

Badin District is part of the Lower Indus Plain formed by the alluvial deposits of the Indus River. The southern part of the district is close to the delta of the river Indus and the land surface is, therefore, relatively low as compared to the northern half.

The Seismic zoning map of Pakistan (2015) places Badin in Zone 2A and 2B which corresponds to possibility of minor to moderate seismic hazards i.e. probability of earthquakes of intensity (MM Scale) 6 to 7.5. The macro-environment of District Badin includes the abandoned deltaic land of the past, an extensive creek system, and some mangrove covered land in the abandoned tributaries of the Indus delta.

Major changes in hydrology and hydrogeology of Badin district took place after the upstream construction of (i) channels to transfer water to and from different river branches and to irrigate farmlands, (ii) barrages to divert the river flow to canals and channels, (iii) drainage system to drain the saline effluents from the left bank of the Indus into the Tidal Link, (iv) flood protection embankments and dykes to prevent river overflow, thus restricting the flow to the main channels, and (v) dams to generate hydropower and irrigate the land which otherwise would have been a desert, and to control floods.

The impact of the above activities on Badin district was (i) its isolation from the deltaic ecosystem, (ii) loss of freshwater that in the past used to leach the saline soil, and (iii) loss of sediment that was brought by the floods. Shrinkage of the delta and reduced flow of the water through a single channel confined by raising the embankment increased the salinity of groundwater in the land adjacent to the dykes thereby negating the positive effects of irrigation.

Aging of the surface drainage canal system surfaced up in the form of: a) enormous seepage losses, which in turn resulted in water logging and salinization of the once fertile land, (ii) silt deposition, weed growth and obstructions made by farmers within the drainage area leading to substantial reduction in the discharge capacity of the drains, b) unchecked discharge of municipal and industrial wastes into the drainage network, c) broken cross drainage, with conveyance and operating structures having had no repair or maintenance for a long time and identifying the strong need to restore them, and d) some of these structures having been deliberately broken to discharge the municipal and industrial effluent into the drainage system.

The sewage from all the urban centers and sugar industries in Badin district are disposed of in the nearest drainage canals.

It is the absence of safe disposal systems that is cause for inducing the farmers to break the structures to drain the accumulated water into the drains. Six agro-based industries (Mirza Sugar Mill Kadhan, Army Sugar Mill Badin, Diwan Sugar Mill Khoski, Pangrio Sugar Mill Pangrio, Diwan Sugar Mill Talhar and Ansari Sugar Mill Matli) are contributing pollutants to surface drains as well as nearby depressions. In urban areas of the district, the supply of contaminated water, unsafe disposal of municipal waste and solid waste,

unsafe disposal of infectious hospital wastes and congested housing also create environmental degradation.

Fisheries

Fisheries are an important activity in Badin. About 10 percent of the overall marine fish exports originate from Badin. Fish landing areas need to be provided facilities of fish processing areas, cold storage, ice plants and auction halls etc.

Forests

Forests help in protection of soil, improve environment by controlling pollution and cause rainfall. Total forest area of the Sindh Province is 831,173 hectares (2008-09) out of which district Badin shares an area of 11,938 hectares[25]. The increased protection of forests could lead to a decrease in the severity of floods. Government and Non-Government Organizations should expand afforestation/reforestation programs near the Buharki and Rarri Forests which can mitigate the flow/speed of flood and prevent soil erosion. Moreover it would also help limit the seawater intrusion.

10.2 Issues and Problems:

- Water logging and salinity
- Water Contamination from industrial effluent
- Low quality of surface water that is not fit for drinking
- Seismic Risk
- The sewage from all the urban centers and sugar industries in Badin district are disposed of in the nearest drainage canals
- Aging of surface drainage canal system

10.3 SWOT Analysis:

Strength	Weakness	Opportunity	Threats
ENVIRONMENT			
Land			
1. Flat fertile land suitable for development 2. Rural rich fertile agriculture land that produces quality crops	1. Unplanned land uses 2. Limited availability of public land for future spatial growth 3. Scattered development of agricultural land parcels 4. Poor administration by agencies	1. Through appropriate urban design principals & standards, Land can be transmitted into mixed land uses for multipurpose activity centres 2. May increase productivity	1. Land shortage for new development. 2. Slum formation 3. Contamination of land in non-irrigated areas

Strength	Weakness	Opportunity	Threats
	monitoring urban growth of the city	cultivated at full strength	
Forestry			
1. Total forest area of the Sindh Province is 831,174 Hectares (2008-09) out of which district Badin shares an area of 11,939 (1.43%) hectare	2. Over cutting of forests to obtain wood is the major problem 3. Different tree species are thinning out in density	1. Aggressive plantation to increase timber and fuel wood 2. The increased protection of forests could lead to a decrease in the severity of floods	1. Sudden fire in forest cause decrease in density of forest 2. Over cutting, deforestation
Climate			
1. Suitable for producing crops	1. Rainfall shortages affect the efficiency of canal system 2. Climate change is responsible for the heavy rains of 2011 and 2012 because usually Sindh province receives very little rains.	1. Agricultural practices can be changed in accordance with weather condition for maximum production	1. Droughts 2. Heavy rains 3. Climate change affects agricultural production
Air			
1. Air quality in the rich agricultural belt is good for human health, and also keeps ecological balance in atmosphere 2. Most of the area is air pollution free	1. Rice production adds moisture in air	1. Development planned with respect to air circulation can provide relief to inner city's polluted environment 2. In future the town can be planned as Green City	1. Air pollution 2. Respiratory diseases

Strength	Weakness	Opportunity	Threats
Urban Area & Areas Suitable for Urban Development			
1. Land available for future development within town urban boundary	1. Loss of agricultural land through land development for housing purpose 2. Water logging 3. Unplanned growth inside town. 4. Lack of utility services	1. Mixed land uses may create activity centres. 2. High density will overcome housing shortages	1. Land grabbing 2. Slums and Unplanned growth 3. Threat to agricultural land 4. Private sector may increase the cost of services
Drainage & Flood Control			
1. Most of the town is served by combined drain and sewer system	1. Open drain on street causing overflow of storm water drains 2. Improper channelization of drains 3. Lack of interest among stakeholders involvement in disaster relief activities 4. Poor administrative control for operating existing drainage system of the town 5. Depression areas causing permanent ponding 6. Reliance on sewer for flood/storm water	1. The city's old drainage system needs revival through cleaning 2. Flood protection embankments should be enhanced up to greater extent to provide maximum protection to surrounding areas 3. Development of surface drainage network with easy disposal to river/canals 4. Completely removal or treatment of land where temporary ponds have been formed in main town area	1. Qazi Wah and Mir Wah canal water have been contaminated by open drains discharge 2. Medium level flood disaster threat to local communities living near to main course of Indus River 3. Open and overflowing drains have impact upon human health and give birth to epidemic diseases

10.4 Policy Guidelines[42]

- Enhancing role of local governments in sustainable management of natural resources
- Conservation of biological diversity, protection and sustainable use of indigenous flora and fauna
- Sustainable Management in Reserved, Protected, Flora and Fauna
- Management of irrigated and linear plantations
- Promotion of indigenous species
- Increase the efficiency of surface drainage

10.5 Strategic Development

I. Long Term Plan

- Drainage can be improved on many sites and is the first thing to consider once a waterlogging problem has been identified. Options might vary from shallow surface drains (ie. Spoon- and 'W'-drains) to more intensive drainage using wide-spaced furrows, to the intensive drainage form of raised beds
- Achieving sustainable development, while overcoming environmental challenges such as land degradation, watersheds and marine fisheries, deforestation, waste management and pollution control, and climate change
- Multi-pronged approach to fisheries management should be adopted that takes account of economic, environmental, and social performance

II. Short Term Plan

Ensuring environmental sustainability by strict adherence to NEQS.

- Prohibition to discharge waste and pollutants into the environment except through permits.
- The requirement for Environment Impact Assessments to be binding on all parties including government;
- The current practice of disposing solid waste and waste water in open pits and low lying ponds to be stopped completely.
- Restoration and maintenance to preserve ecological cycles, functions and services of environment
- Strengthening forestry education and research institutions to cope with the emerging challenges of deforestation and climate change
- Increase the productivity of rangelands
- Provide recreational facilities for public by improving forest parks
- Rehabilitate degraded ecosystems and create environmental awareness
- Alleviate poverty through creation of forest based income generating opportunities

[42] National Forest Policy 2010

- Develop and implement policies that integrate the objectives of conservation and development to reduce pressure and protect environmental values and conserve biodiversity
- Fostering public-private partnerships and communities for conservation of forests.

10.6 Priority Projects

- Rehabilitation of Irrigated plantation
- Enhance Rangeland production and planting fodder trees for farmer community
- Improvement and Rehabilitation of Forests Parks
- Afforestation of Blank Reaches along Important Highways

10.7 Immediate Action Plan

Considering the dry and hot environment, it is suggested to enhance tree plantation with urban forest. Enhance rangeland production and plantation of fodder trees. Forest parks should be improved and rehabilitated.





11.DISASTER RISK MANAGEMENT

11.1 Existing Situation

Badin is the main city and DHQ of Badin District in Sindh, Pakistan. It lies east of the Indus River. The region is swampy, fertile, and suitable for growing rice. Some oil fields are located near the town. Badin is the main town of Badin District. The population of the city in 1998 was 61,843. Badin district was hit by 2003-2011 and 2012 rains/floods. Badin is a highly disaster prone area and disasters of different types have occurred in the past. The most frequent and damaging disasters are the floods. District Badin is vulnerable to floods and heavy rainfalls. Badin has been affected by floods due to precipitation and drainage.

i. Floods / Rains.

Badin is a highly disaster prone area and disasters of different types have occurred in the past. The most frequent and damaging disasters are the floods. River Indus, after receiving water from five of its tributary rivers, causes floods in the northern and southern parts of Sindh province. Badin district was hit by 2003-2011 and 2012 rains/floods.

District Badin is vulnerable to floods and heavy rainfalls. Badin has been affected by floods due to precipitation and drainage.

The Badin July 2003 precipitation was 303.9 mm while in 2011 (August 11 & 12) the precipitation was 331 mm which caused major flooding and destruction in the district.

ii. Cyclones/ Tsunamis

The cyclone of 1999 had shocking impact on district Badin. 176 human deaths and 17,289 deaths of livestock. The affected population was 452,000. 56,678 houses and other buildings were damaged. The total affected area was 263,055 acres. Three union councils namely Ahmed Rajo, Bhugra Memon and Kadhan are directly while, seven union councils such as Mithi III, Pangrio, Khoski, Seerani, Abdullah Shah, Kario and Garho are affected indirectly with intensity of this cyclone.

iii. earthquakes

According to the seismic zone map of Pakistan, the Badin district is situated at zone where moderate to severe damage can occur.

Accordingly, a seismic risk factor of 0.1 needs to be incorporated in the design for constructions and installations in the coastal zone, for operational basis earthquakes (OBE) pertaining to damage due to moderate level earthquakes.

iv. Droughts

In routine, within a normal year, between 15 to 20 percent of poor families migrate towards areas of province Sindh which have barrages such as Badin, Sanghar, Mirpurkhas, Hyderabad, Tando Allahyar and Tando Mohammad Khan to work as the seasonal labor and other livelihood

opportunities. Due to droughts, approximately 25 to 35 percent population of region migrated to work in friendly environments.[43]

For example, in 2014 it has been observed that approximately 40 to 50 percent families were forecasted to migrate towards barrage areas. Most of these people prefer to settle and work at low wages, leaving them with little opportunity for bargaining power, and where their identity is counted as susceptible as exploited by their employers. In case of arrival of drought if the government is already informed about the situation government should take concrete measures to provide permanent solutions to save water and boost water resources through which the situation can be tackled.

v. Seismicity

According to the seismic zone map of Pakistan, the Badin district is situated at zone where moderate to severe damage can occur.
Accordingly a seismic risk factor of 0.1 needs to be incorporated in the design for constructions and installations in the coastal zone, for operational basis earthquakes (OBE) pertaining to damage due to moderate level earthquakes.

vi. Hot Wind Twisters

Badin district frequently accommodates hot wind and dust storm twisters during peak summer season starting from May and ending till mid of August every year. However the rich agricultural belt that surrounds the district provides natural protection against such small scale twisters and hot wind whirls. The hot wind twisters cause loss to agriculture normally occurring in the month of May every year. However protective measures found are limited in terms of effectiveness for corps protection.

A. Impacts of Floods

i. Food

District Badin was marked one of the vulnerable district after 2011 flooding and found exposed to food shortages. The statistics regarding food shortage indicated disappointing results for food protection within categories of availability, access, utilization and stability set by World Bank and United Nations.

ii. Health

Severe floods can not only cause destruction to heath care infrastructure but also affect health indicators of the affected population. The Floods, in 2011 resulted in damage to the public health infrastructure in Sindh Province. According to PDMA report 2012, 1,021,301 Population needed health relief in district Badin and total number RHCs, BHUs and GDs which are affected during flood 2011 are 7. Out of which 3 were from Taluka Badin and 4 were from Taluka Tando Bagho.

[43] https://www.dawn.com/news/1132994, published on sept 19,2014.

As per data collected after flood 2011, the flood affected health facilities in district had marginally adequate stocks of medicines, equipment and other consumables for one to two weeks.

iii. Education

Due to the floods of 2011, 249 school facilities were partially damaged and IDPs occupied. The building structure of 221 schools were fully damage.

iv. livestock

Beside loss to natural resources, crops, agricultural lands and human life and activities, livestock's life is always endangered by droughts. Thus, alternate arrangements for emergency response facilities like nutritious fodder, vaccines and livestock sanctuaries must be established to prevent the migration or demise of livestock during droughts. The responsibility to implement such measures falls upon the Livestock Department.

As the fodder depletes, livestock are fed on dry grass, leading to a host of digestive problems such as diarrhea, toxemia and metabolic disorders; compromising their immune systems and affecting milk production. This adds to the woes of livestock owners, whose total income generation dependency is upon production of milk produced by cattle, for the benefit of their families and affordability.

As weak and diseased livestock migrate with their owners to barrage areas, a trend of collapse in livestock prices has also noticed, with a healthy goat that sold at full price, once weakened by drought, normally worth only 35% of its original price.

11.2 Public Safety

Public safety is the priorities principal of any governance whether it is Federal, Provincial, Divisional or District.

To spread terror in residents, terrorists mainly focused / target crowded places e.g. educational institutions, stadium, shopping centres, malls, religious centres, institutional setups like press club etc., which are less protected in Sindh especially. Terrorist activities can be performed in any shape but mainly on crowded places.

- **Crowded Places**

  Crowded places will remain an attractive target for terrorists, who have demonstrated that they are likely to target places which are easily accessible, regularly available and which offer the prospect for an impact beyond the loss of life alone (for example serious disruption, or a particular economic/political impact).

  Responsibilities of National / Provincial / Local Government.

Police and Local Administration Government have the primary responsibility for preventing, preparing for, responding to, and recovering from terrorist attacks in their jurisdiction.

The protection and resilience of crowded places—particularly those at an elevated security risk—is a key focus of National / Provincial Police / Local Government Administration. While the owners and operators of crowded places remain responsible for implementing protective security measures, National / Provincial Police / Local Government Administration acknowledge that responsibility for building and sustaining resilience to terrorism is shared between government, owners and operators, and communities.

National / Provincial Police / Local Government Administration are responsible for providing threat information to owners and operators of crowded places. This includes material developed by National / Provincial Police / Local Government Administration, Law Enforcement Agencies (LEA) etc. Police provide specific information on the local threat context to help owners and operators develop protective security measures.

Police are also responsible for running and administering Crowded Places Forums. These Forums are the primary means of collective engagement between police and local owners and operators of crowded places, including businesses and local councils. Members of the Crowded Places Forum can share information, guidance, and lessons learned relevant to their local circumstances.
Responsibilities of Stakeholders.

Implementation of protective security measures and reducing the vulnerability of crowded places to terrorist attack was not just a job for the Government (Federal / Provincial / Division / District) and the police alone. To be most effective, this work requires engagement from a range of local partners, including local authorities and businesses, in order to identify vulnerable sites and prioritize work to reduce those vulnerabilities.

- **Identification of Land uses for Potential Terrorists Attack**

Consultant identified different land uses in Badin which are potential crowd pulling places.

Table 11-1 : Potential Terrorists Threat

S. No	Landuse	Terrorist Threat
1	**Education**	Secondary Schools/College/ University
2	**Health**	BHU/Hospitals/Medical Collages
3	**Commercial**	CBD/Mandi/Shopping Mall
4	**Religious**	Eid Gah / Shrines/Minority Religious Places/Imam Barghas
5	**Government Offices**	District Court/DCO Office/SSP Office/District Jail/Police Head Quarter/LEA
6	**Recreational**	Tourism Places
7	**Transportation**	Bus Stop/Railway Station/Airport

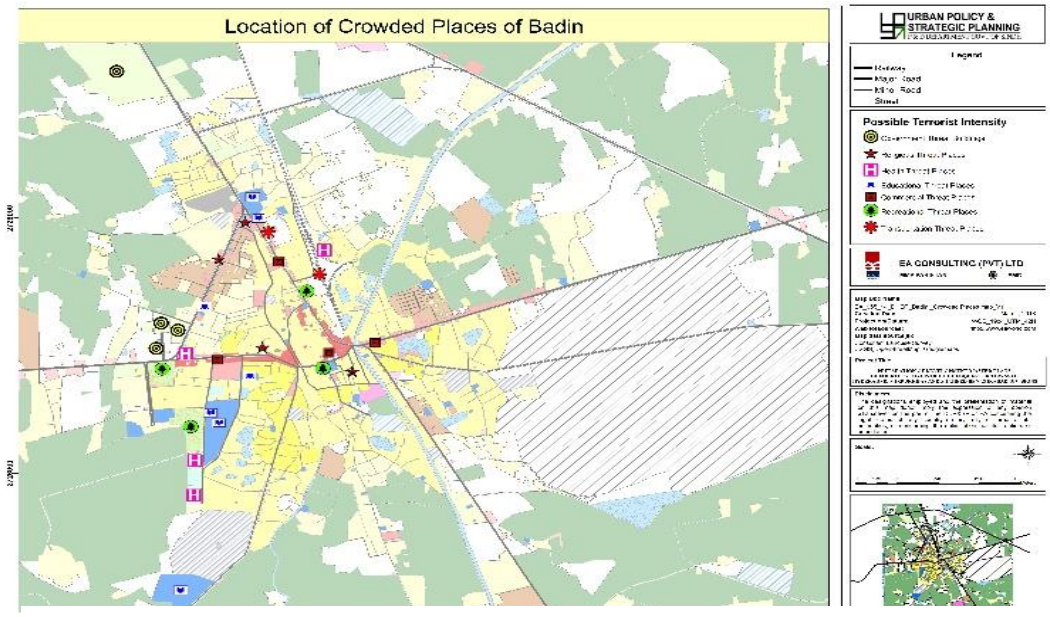


Figure 11:1: Crowded Places of DHQ Town Badin

Concerned authorities have not come up with any plan for terrorist's activities / attack to reduce potential threats, incident management, crisis management, business / life continuity and recovery phases.

- **Possible Terrorist Intensity Places of DHQ Town Badin**

  Consultants identified some possible terrorist Intensity places of DHQ Town Badin on the basis of Crowd and most visiting places by the residents of DHQ Town Badin, the places are classified according to the given above table.

- **Planning to Counter Potential Terrorist Threat**

  It is aimed at those places where there may be a risk of a terrorist attack by nature that they are crowded places. It is accepted that the concept of absolute security is almost impossible to achieve in combatting the threat of terrorism, but it is possible, through the use of this guidance, to reduce the risk to as low as is reasonably practicable.

- **Proposed Strategy to Counter Potential Threat Measures**

  Proposed Strategy for Protecting Crowded places from Terrorism is based on strong, trusted partnerships between all levels of government and those responsible for crowded places. It aims to make crowded places as resilient as possible to terrorist attacks while preserving our use and enjoyment of these places. A nationally consistent approach will help achieve this objective in an effective and efficient manner.

  The Strategy involves four core elements which provide a structure for building a consistent national approach to protecting crowded places that can be applied flexibly.

  - **Building Stronger Partnerships**
  - **Enabling Better Information Sharing and Guidance**
  - **Implementing Effective Protection Security**
  - **Increasing Resilience**

- **Building Stronger Partnerships**

  Protecting crowded places from terrorism is not just a job for governments, it is a responsibility shared by the private sector and the community. The success of this Strategy rests on sustainable and strong partnerships between all governments and owners and operators of crowded places, including businesses and local governments.

  Trusted relationships between governments and owners and operators of crowded places are fundamental to the effective implementation of this Strategy. The Crowded Places Partnership sets out a range of mechanisms to support this engagement, but none of these replace the ability for all police and intelligence agencies to engage directly with owners and operators when required.

- **Enabling Better Information Sharing and Guidance**

  Protecting crowded places from terrorism in an evolving threat environment requires trusted and routine information sharing and guidance between all governments, industry sectors, business, and communities.

  It is a key responsibility of government to ensure those who own and operate crowded places have access to high quality threat information.

  The flow of information between governments and those responsible for crowded places is not one-way. Owners and operators should be willing to share information, advice, and lessons they have learned with governments and their peers. Building a strong and inclusive security culture is a responsibility shared by all.

- **Implementing Effective Protection Security**

  Implementing protective security measures can be a complex process which, if done incorrectly, can be costly and ineffective. Owners and operators have a responsibility to undertake a risk assessment and/or vulnerability analysis of their crowded place, implement the appropriate mitigations, monitor them for effectiveness (including through audits), and review them at appropriate junctures.

  - **Guidance**

    Before owners and operators make decisions about protective security measures they must first understand how attractive their location may be for a terrorist to attack.
    Crowded places encompass a significant range of different locations, venues and businesses. They differ substantially in size and have different levels of risk to manage.

  - **Layered Security**

    The goal of layered security is to reduce the likelihood of a successful terrorist attack on a crowded place by building multiple layers of redundancy into a site's security architecture.
    Layered security describes the practice of securing a site by applying multiple layers of complementary protective security measures.
    The following represents some examples of protective security measures that can be used within each layer. Some security measure can strengthen multiple layers. For example, the effective use of security officers can help to delay, detect, deter, respond to, and recover from an attack.

Deterring a potential terrorist attack can involve the presence of obvious physical and electronic target hardening measures, including:

- Fencing indicating demarcation;
- Perimeter security lighting;
- Warning signs and notices;
- High visibility security patrols;
- CCTV cameras;
- Perimeter vehicle security barriers.

Detecting a potential terrorist attack can occur through visual detection and alert systems, including:

- CCTV cameras;
- Electronic intruder detection systems;
- Reporting of suspicious behaviour by security officers, staff, or members of the public;
- Vehicle screening and searching;
- Canine explosive trace detection;
- Screening—x-ray machines, metal detectors, explosive trace detection, and bag inspections.

Delaying a potential terrorist attack can occur through physical counter-measures and other approaches including:

- Security fences;
- Environmental barriers including water features, natural topography, and vegetation;
- Vehicle security barriers and measures to slow the speed of vehicles;
- Pedestrian and vehicle access control points;
- Trained staff interventions;
- Rapid security officer response.

Responding to a potential terrorist attack requires a timely and coordinated security response throughout a crowded place's area of control. Important elements of response include:

- Security staff who can respond quickly and possess the requisite training, competence and equipment to deal with or limit the impact of threats to the location;
- Reliable emergency communication systems throughout the location;
- Comprehensive security plans that are understood by all staff and security personnel, regularly exercised, and compatible with local emergency services plans.

Cost and Proportionality

Security measures can be resource intensive, costly and, if not correctly managed and communicated, can alienate staff and the public and significantly disrupt the day-to-day operations of a crowded place. This is why expert specialist advice is essential and why careful consideration and planning is required before implementing any protective security measures. The following principles should underpin all decision-making:

- It is not possible to protect everything, so owners and operators must **prioritise** the highest risk areas of a crowded place;
- All protective security measures should be **proportionate** to the level and type of threat;
- Security is more **cost effective** when incorporated into the design phase of a crowded place.

Reputation

The success of governments and businesses rests on building and maintaining a good professional reputation. Reputation is prone to serious and permanent damage if owners and operators of crowded places give a less than robust, responsible professional priority to protecting people against attack. Being security minded and better prepared could not only deter an attack, it reassures customers and staff that those responsible for crowded places are taking security issues seriously.

Recovery

Recovery from a terrorist attack is the process of rebuilding, restoring and rehabilitating affected individuals, communities, and physical assets. This process usually begins once an incident has been resolved, continues until disruptions have been rectified, demands on services have returned to normal levels, and the needs of those affected have been met.

- **Increasing Resilience**

Even the most the most robust and thorough protective security plan may not stop a terrorist attack on a crowded place from occurring or succeeding. But what well-considered and tested protective security does is reduce both the likelihood of a terrorist attack occurring and the consequences of such an attack.

Resilient crowded places can do more to prevent a terrorist attack, can reduce the damage caused by an attack, and can recover more quickly after an attack has occurred. Building a strong security culture is central to developing resilience to terrorism and other types of criminal activity.

Other elements of building an effective security culture can include:

- Ensuring that security is a permanent feature of executive decision making and agendas;
- Requiring senior management to demonstrate personal commitment to and compliance with security values and standards;
- Understanding commercial, reputational and legal risk that could result from inadequate protective security measures being in place to prevent or mitigate a terrorist attack;
- Providing staff with clear, succinct and jargon-free guidance about security standards and procedures;
- Promoting good security practice to both staff and visitors by making use of internal communication systems, posters, message boards and newsletters;
- Adopting effective and lawful staff screening processes during recruitment;
- Providing staff training in security practices;
- Exercising all staff in security scenarios;
- Self-initiated security penetration and breach testing;
- Sharing information with staff about security breaches;
- Encouraging and rewarding staff for identifying and reporting security vulnerabilities

11.3 Issues and Problems

- Low levels of risk awareness and knowledge.
- Development not "risk conscious" and DRR not yet effectively integrated.
- Insufficient DRR capacity at all levels of society.
- The involvement of the private sector in DRR is as of yet negligible.

11.4 Policy Guidelines[44]

- RM plans and initiatives need to be based upon assessments that identify the nature and degree of vulnerability or risk (including the identification of particularly vulnerable groups), that allow prioritizing problems or geographical areas on a rational basis and that inform the design of appropriate and technically sound DRM interventions.
- DRM initiatives need to build upon existing community organizations and relevant coping mechanisms to be sustainable.
- Engaging communities in vulnerability and capacity assessments provide entry points to build awareness, commitment and resilience in the face of disasters.
- DRM requires the involvement of women as stakeholders to build resilient communities.
- Clearly defined division of roles and responsibilities between different layers of government.

11.5 Strategic Development Plan

The aim of the policy is to advocate an approach to disaster management that focuses on reducing risks – the probability of losing one's life or health, assets and livelihoods.
Some of the objectives in this aspect includes:

I. Long Term Plan

- National risk assessment would identify highly vulnerable districts and be complemented by higher resolution work at local level to diagnose the underlying causes of risk, explore concrete risk reduction options and inform development planning and prioritization exercises and/ or disaster preparedness planning.
- Assessments should be conducted using a uniform methodology and process for multi-hazard vulnerability and risk assessment so they can help to refine the national/ provincial data-bases.
- DRR needs to address and involve local level actors in high-risk communities to be effective and produce sustainable results.
- Provide disaster relief centres is high risk areas for shelter is higher. Places with medical facilities and food distribution centres.
- There is a need to have clear arrangements that allow the system to switch into emergency mode and mobilize necessary resources in a timely and effective manner.

[44] National Disaster Risk Reduction Policy 2013

- There is need to clarify mutual roles and responsibilities (horizontal and vertical) and coordination arrangements in an updated, multi-hazard national response plan that is based upon current legislation.

II. Short Term Plan

- Provision of the right to timely emergency care by providing quality emergency service as per international standards.
- Creating an integrated District and provincial level capacity to identify and monitor vulnerability and hazard trends including potential climate change impact.
- Strengthening an integrated disaster preparedness and response capacity from the local to the national level.
- Promoting development planning that considers and addresses disaster risks alongside environmental and climate change concerns.
- Strengthening capacity at national and provincial levels to facilitate and provide support to the implementation of DRM policies, plans and programs across sectors and in high-risk areas
- Strengthening Local Level Risk Reduction capacity focusing upon communities, and supportive linkages with Union Councils, tehsils and districts.
- Strengthening the structural and non-structural resilience of key infrastructure and lifelines in Pakistan.

11.6 Priority Projects

- There is a need to set criteria for the identification and declaration of "disaster affected" areas. Disaster declarations may temporarily restrict individual rights (such as property rights or mobility).
- DRM strategies and initiatives need to be based upon clear assessments of disaster risks i.e. a quantitative and qualitative understanding of the underlying causes and vulnerabilities, geographical distribution of vulnerability and hazards , the probability of hazard occurrence and predicted losses.
- The creation of an integrated multi-hazard damage loss data-base is therefore a prerequisite for systematic vulnerability and risk monitoring.

12.CLIMATE CHANGE EMERGENCY CONTINGENCY PLAN

- **District Level Plan**

  Badin district is prone to canal flooding and floods caused by heavy rainfall.

- **Broad `Contours of the Plan**
  - Early warning of approaching weather system will be provided by Pakistan Meteorological Department (PMD) and communicated to the District Disaster Management Authority (DDMA). DDMA is expected to translate weather forecast and flood warnings into usable early warning for vulnerable communities and ensure its timely dissemination to all concerned.
  - In case, there is continuous rise in major canal water level the people residing near major canals will be evacuated to safer places.
  - Threatened population will be evacuated by DDMA.
  - DDMA would be responsible for provision of search and rescue, medical and emergency responses.
  - Camps will be established at pre-selected sites by DDMA.
  - DDMA would be responsible for effective and transparent relief distribution including relief provided by Provincial Disaster Management Authority (PDMA), National Disaster Management Authority (NDMA) and other Humanitarian Agencies.
  - All stakeholders would take necessary actions to facilitate early recovery and rehabilitation of affected population.
  - In case the district falls short of meeting the humanitarian needs, PDMA will assist by making available the required stocks. In case when disaster exceeds capacities of the provincial government, NDMA will be requested to make available the additional stocks from national reserves, prepositioned across the country.
  - When required, Armed Forces may be requested for assistance by PDMA Sindh at any stage, particularly for rescue, evacuation and emergency relief phases. Thus, the DDMA will have to submit the request to PDMA for assistance of armed forces in aid of civil administration.
  - Special requirements of Aviation / Naval support by any agency will be coordinated by PDMA.
  - Resources of Government Departments and Agencies such as, Pakistan Red Crescent Society and domestic philanthropy may be requisitioned, if the intensity of the situation so entails for an effective response.

- **Early Warning**

Pakistan Meteorological Department

- Pakistan Meteorological Department (PMD) has a broad mandate of supporting agro-based economic activities, air and maritime traffic safety, disaster mitigation efforts and disseminating weather forecast to numerous end users. PMD will ensure the following during monsoon season:
- Inform public on the weather forecast and issue warning in case of potential threat like Rainfall.
- Collect rain data on a regular basis, consolidate and share it with all concerned.
- Disseminate flood information to the NDMA/PDMA on a daily basis during flood season.
- Share weather forecasts and early warning information with NDMA, F/G/S PDMAs, and the media on a regular basis in the monsoon period.
- Coordinate with FFC, WAPDA, PCIW, FFD, and SUPARCO in the Monsoon period to generate flood warning where wanted.

I. Flood Forecasting Division (FFD)

- FFD is an affiliated organization of PMD. It disseminates flood early warning and river flow updates to relevant National, Provincial and District Governments and National Response Agencies, especially in the context of Monsoon Season.

II. Pakistan Space and Upper Atmosphere Research Commission (SUPARCO)

- SUPARCO deploys its satellite imagery capacities for disaster impact mitigation and for early warning of disaster occurrence and trends monitoring. SUPARCO will play the following role during monsoon season:
- Provide remote sensing and satellite maps before and during disasters in order to show their impact.
- Provide remote sensing and satellite maps for hazard risk zones to enable relevant agencies to take measures for minimizing damage to population and property.
- Assist post-disaster damage assessment.

III. District Disaster Management Authority (DDMA) Response

- DDMAs shall activate District Emergency Operation Centers (DEOCs)
- In the event of a disaster, organize emergency response through the District Emergency Operation Center (DEOC)
- Setup early warning mechanisms and dissemination of proper information to public, prepare district level response, plans and guidelines, establish stockpiles of relief and rescue material; provide information to PDMA on different aspects of Disaster Management.
- Inform/update PDMA regarding the overall situation.
- Organize evacuation on priority basis.
- Conduct initial and subsequent assessment of disaster affected areas and determine the extent of loss and damage.
- Collect information on damage status and promptly plan for the resources requirement for relief operation and share it with the PDMA.

- Provide food, drinking water, medical supplies and NFIs to the affected population
- Preferably, set up tent cities / relief camps on open land and provide relief to the affectees in camps.
- Coordinate with PDMAs to deploy resources for emergency response.
- Mobilize community volunteer groups and civil defense for emergency operations.
- Forward timely situation reports (SITREP) on daily basis to PDMA for its timely dissemination to concerned quarters.
- Ensure registration of all relocated population in the camps and overall affected population on gender-segregated basis.
- Prioritize vulnerable segments of society in their relief operations.
- Facilitate early return of relocated population and help in restoring their livelihoods.

12.1 Health Department

I. Pre-Disaster

- Provide specific information required regarding precautions for epidemics
- Establish a health mobile team in district & town headquarter hospital
- Setup an Information Center to collect and share information amongst relevant stakeholders.
- Collaboration with relevant organizations/partner NGOs.
- Stocking of life saving drugs and vaccines.

II. During Disaster

- Providing emergency treatment to the affected
- Provision of First-aid & water testing kits, chloramines and anti-snake venom serum & other emergency support
- Deployment of mobile medical teams & health staff
- Collaboration with all relevant stakeholders

III. Post Disaster

- Establishment of medical camps, vaccination, ensuring safe food & water in camps
- Conduct impact assessment on health, intervene to stop outbreak of diseases
- Rehabilitation of health infrastructure

12.2 Education Department

I. Pre-Disaster

- Providing the necessary information, training to teachers & students regarding disasters with tips to save their families & themselves during disaster.
- In collaboration with Civil Defense and Boy Scouts / Girl Guides Association and gear up the volunteer's force.
- Educate students about Healthcare Precautions

II. During Disaster

- Mobilize the human resources for intervention during disaster
- Arrangement for evacuees to setup relief & temporary shelter camps
- Deployment of volunteers for camp management & emergency support

III. Post-Disaster

- Assessment of damages & needs of affected educational institutes
- Rehabilitation of affected educational institutes
- Continuing education of children at camps and helping them to recover from shock by providing toys etc.

12.3 Agriculture Department

I. Pre-Disaster

- Assessment of high risk prone areas and estimation of possible damage
- Create community Seed Bank at UC level
- Regular surveillance of Irrigation water supplies
- Close coordination with Meteorological Department & other stakeholders for weather information.
- Testing, functioning and pre-positioning the available machinery.

II. During Disaster

- Immediate mass awareness and update of situation
- Arrangements for relief & temporary shelter camps in canal rest houses
- Vigilance for protection of agriculture crops.
- Immediate activation of machinery and equipment.

III. Post-Disaster

- Assessment of damages & needs of affected crop area and submit to DDMA
- Assistance in repair & rehabilitation of Irrigation Systems.
- Timely compensation to affected farmers

- Mass awareness campaigns regarding epidemics & diseases to crops
- Inform the affected population regarding the land use and crop management on damaged/devastated areas.

12.4 Livestock and Fisheries Department

I. Pre-Disaster

- Estimation of possible damage
- Mass awareness regarding precautions
- Close coordination with agriculture, irrigation, meteorological department and other stakeholders.
- Vaccination of livestock.
- Stocking of fodder and vaccines.

II. During Disaster

- Update local communities of ongoing situation.
- Provide livestock vaccination
- Arrangements for relief and transportation of livestock.
- Provision of fodder for livestock in affected area.

III. Post-Disaster

- Assessment and submission of damages and need of affected livestock to DDMA
- Timely compensation to affected livestock owners
- Mass awareness campaign regarding epidemics & diseases to livestock

12.5 Police Department

I. Pre-Disaster

- Information dissemination through "15 helpline service" to local residents
- Deploying and giving security cover to government agencies, which are working/preparing for the monsoon season in areas where law and order is not good.

II. During Disaster

- Providing easy access and security to rescue and relief teams.
- Maintain law and order and divert traffic on alternative safe routes as and when necessary.
- Maintaining law and order and provide security to relief stockpiles and camps.

III. Post-Disaster

- Ensure security to workers of NGOs/INGOs
- Provide security in unsafe areas
- Facilitating institutions/NGOs/INGOs, which focus on rehabilitation activities.

12.6 Civil Defense

I. Pre-Disaster

- Information sharing regarding technical and personnel expertise with DDMA.
- Conduct training for volunteers in first aid & other activities
- Effectively train & mobilize volunteers and initiate mass awareness regarding necessary first aid rescue activities

II. During Disaster

- Deployment of volunteers at the disposal of DDMA for Rescue, Evacuation and initiated basic first aid.
- Communicate to DEOC any additional resources required for performing rescue and evacuation activities
- Taking precautionary measures to stop fire incidents in camps and perform firefighting in emergency.
- Management of relief camps where required.

III. Post-Disaster

- Identify gaps and make plan to overcome weaknesses
- Assisting District Administration and other Line Departments in Rehabilitation works

12.7 Civil Society and Private Sector Response[45]

The response of civil society organizations and the private sector to floods should be rapid and extensive. Local NGOs, will work extensively with the Government to provide emergency relief support provisions which include ration packs, water purification kits and tablets, shelter items (including tents, blankets and mosquito nets), sanitation kits and hygiene supplies, doctors and medical supplies, mobile and basic health care units especially for women and children. A particular focus will be placed on healthcare services to avoid the spread of water- borne infections and other disease and to provide basic health care services. Media on their part will cover the event extensively and play a significant role in raising awareness and mobilizing local and international resources for the disaster. Individuals and organizations from the private sector, both from Pakistan and the global community will contribute significantly to the flood relief effort alongside the government and donor community.

[45] Government of Sindh Rehabilitation Department Provincial Disaster Management Authority, 2012. Sindh Provincial Monsoon/Floods Contingency Plan, Karachi: Government of Sindh

12.8 Scouts

I. Pre-Disaster

- Nominate the scouts, which can be trained to handle flood emergencies
- Training will be imparted in the scouts regarding boat handling and first response to the affected during the emergency.

II. During Disaster

- Trained scouts will be deployed/placed at the disposal of Deputy Commissioner
- The scouts will perform the duties as per training and will report to respective Deputy Commissioner

III. Post-Disaster

- The trained scouts would continue to impart the training in other scouts and volunteers in the district.

12.9 Standard Operating Procedures (SOPS)

- The Deputy Commissioner shall keep close liaison with all departments like Local Government, Health, Agriculture, Civil Defense, Irrigation, Works & Services, Education & Literacy, Police & other Law Enforcement Agencies. Meetings in this regard are to be held on regular basis with concerned departments and minutes are to be shared with DDMA.
- If there is likelihood of heavy rains, flood emergency would be declared in the District and all government functionaries and NGO's would be kept on high alert.
- Control rooms would be established at District and Taluka level in the offices of the Deputy Commissioner, Assistant Commissioner, Qanoongo (Revenue) and all other line departments during the emergency. These control rooms shall function round the clock.
- The Executive Engineer Irrigation will establish round the clock control room in his/her office for making liaison with all concerned & activate contingency plan of the department. They shall identify the vulnerable points of the irrigation canals and intimate DDMA. Executive Engineer will be in touch with DDMA and the Meteorological Department and inform the concerned agencies about any development emergency. He/She will make special arrangements for watching and patrolling of vulnerable points.
- Immediate arrangements for necessary machinery, sand bags and other material to be used for strengthening of embankments of canals and plugging breach shall be ensured and availability of communication network must be made at all vulnerable points.

- The Executive Engineer Irrigation shall ensure regular, timely and proper de-silting of all canals, distributaries, drains, sub-drains and submit a certificate to his/her higher authorities with an information copy to DDMA.
- The Deputy Commissioner shall ensure activation of Central District Control Room and already established control rooms at each Qanoongo (Revenue) Offices round the clock, under the supervision of Assistant Commissioner concerned. They shall also ensure preparedness at proposed relief camps and ensure immediate evacuation of people residing in low-lying areas to safer place / relief camps, if required. He/She shall also make immediate arrangements for the availability of sufficient quantity of relief material like food, blankets, tents, plastic sheets etc.
- The Deputy Commissioner shall constitute Supervisory Committee for relief works at district level.
- The Deputy Commissioner must further ensure that special attention is given to disabled people, women and children and extra ordinary measures are taken for such purpose.
- The Deputy Commissioner shall nominate the Assistant Commissioner as focal person to coordinate with the Taluka and Town level local council for drainage of accumulated rainwater.
- The Assistant Commissioner shall be focal person in Taluka for the entire operations of rescue and relief. He/She must ensure the respective arrangements for tractor trolleys and labor in coordination with Civil Defence, Boy Scouts Association and Police Department if needed and mobilize the village staff in the pre-and-post emergency work. He/She shall also ensure proper distribution of relief material among the actual needy persons.
- The Executive Engineer Irrigation Department shall ensure availability of bulldozers, excavators and earthmoving machines in sufficient quantity and in proper working condition in case of emergency.
- The Director Agriculture shall arrange for protection of standing crops from damages and diseases that may be caused from the stagnant rainwater in the fields. He/She shall manage required machinery from mechanical wing and must have the inventory of such machinery and equipment.
- The Deputy District Officer Livestock and his/her staff shall ensure safety of livestock from flood diseases and losses and Veterinary Officer shall ensure regular and timely vaccination of cattle in the district. They shall make all necessary arrangements for fodder for the livestock to be shifted from marooned areas.
- The Deputy Controller, Civil Defense should ensure the enrolment of volunteers as early as possible in order to avoid any chaotic situation during emergency. He/She will continuously remain updated of weather forecast reports and with meteorological departments and will arrange for warnings in emergency through sirens, loudspeakers and media at Taluka and town level. He/She shall ensure presence of the volunteers and scouts for rain relief and rescue activities in case of any emergency.

- The Deputy Director Food shall ensure availability of sufficient stock of wheat and other grains and shall coordinate with Deputy Commissioner for supply of food grains from local food grain dealers in case of need. He/She will also ensure that no stocks of government wheat, placed at depots, are damaged due to water accumulation, fire or rioting.
- The Divisional Engineer Telephone should ensure full function ability of telephones all over the district and provide assistance to all departments on demand at the time of need.
- Continuous supply of gas and proper safety of gas lines in the district must be ensured. Immediate repair work should be performed in case of any damage to the gas lines.
- The Deputy Commissioner shall ensure mobilization of the NGO's and business community in the rescue and relief activities in case of emergency and shall depute volunteers on different emergency tasks.
- The Regional Director Information shall keep close liaison with all control rooms of the district to provide correct and exact information to media regarding emergency. He/She shall also arrange briefings about the latest situation in case of emergency.
- The Red Crescent Society and other welfare associations and NGO's of the district shall provide food packets and other required material to the affected persons in relief camps in case of emergency.
- Proper arrangement for lifting of trees fallen due to heavy rain and gusty winds from the main roads shall be made by the Executive Engineer Provincial Highways department.
- The in charge Utility Store Corporation shall ensure the availability of sufficient stock of edible items in case of need.
- The Revenue Department shall also conduct the survey of any loss of life, houses, cattle, standing crops and other infrastructure after the disaster. In the event of the highest degree of emergency, Pakistan Army may be requested to help the district administration in rescue and relief operations.

12.10 Implementation and Monitoring

I. Indicators

II. Quantitative Indicators

OECD (2002) defines an indicator as a ''quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor.'' Quantitative indicators are numerical representations of complex phenomenon. Quantitative indicators can be useful in determining the level of

achievement at all stages of a resilience project and can even be used to measure the strength of resilience characteristics, though this is better attained by using qualitative indicators[46].

III. Qualitative Indicators

Qualitative indicators evaluate the quality of a plan using subjective data (relying on people instead of instruments). Many qualitative indicators use a 1-5 scoring system, however, this is not the only way; Sovacool (2012) points out that indicators could ''rely on a simple scoring technique of 'positive,' 'negative,' or 'neutral,' as in a given metric can worsen, improve, or stay the same over time.''

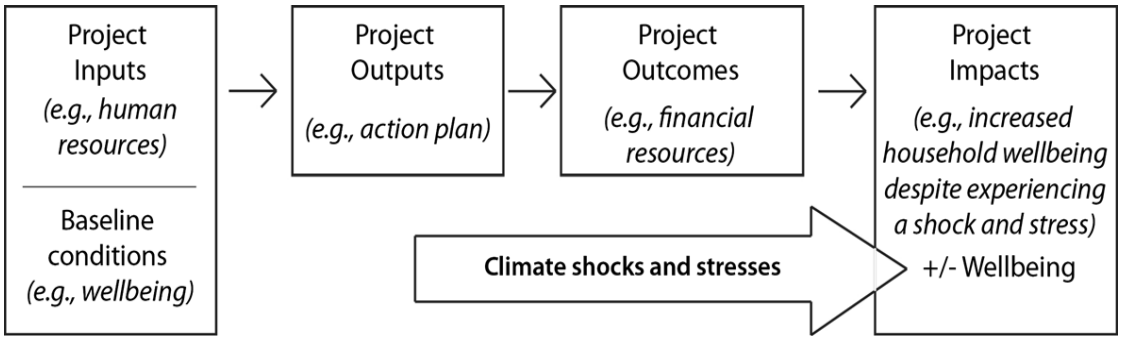


Figure 12:1 : Four phases of a resilience initiative, and the timing of baseline and post-shock Measurements of wellbeing (Brown, et al., 2018)

These qualitative values can be used to create baselines and/or to indicate that a particular resilience impact/outcome has been achieved. The challenge with a qualitative indicator that uses a scale from 1-5 is that the scale should be created based on criteria that is fair and well informed.

IV. Process Indicators

There are many processes that underlie resilience planning and action, and process indicators outline the extent to which these processes have been undertaken. Moser and Boykoff (2013) write that given the challenges (e.g., attribution) in adaptation and resilience measurement, ''tracking and evaluating the adaptation process—with all of its individual components (e.g., assessment, planning, stakeholder engagement, decision-making, implementation, institutionalization, monitoring, and social learning)—becomes at least as important as the questions of success in outcomes''.

An example of a process indicator is the level of participatory involvement in resilience decision making. If one's definition of resilience encompasses participatory involvement, then the extent to which this has been applied can be used as a process indicator. This can be assessed qualitatively (on a scale of 1-5) or quantitatively (number of stakeholder types represented).

[46] *Brown, C., Shaker, R. R. & Das, R., 2018. A review of approaches for monitoring and evaluation of urban climate resilience initiatives. Environment, Development and Sustainability, 20(1), pp. 23-40*

V. Impact Indicators

Determining the impact of resilience initiatives is a bit difficult, as these impacts are often difficult to interpret or understand and can often not be measured until after a disaster, or at least until the slower onset effects of climate change have started to occur (e.g. sea level rise). One approach could be to assess the process and outcome indicators and inferring from the results that climate change resilience has been reasonably ensured.

Wellbeing and financial losses after a disaster are the two most important climate resilience indicators that can help to assess the success of climate change resilience initiatives. By evaluating these indicators, evaluators can gain an insight to the effect of climate change resilience initiatives on the community. By assessing these two indicators, a city can determine whether it has the adaptive capacity to remain resilient in the face of shocks and stresses resulting from climate change.

VI. Identified Indicators[47]

Collection of Data to Perform Vulnerability Assessments to Floods

- Number of exposure and socio-economic datasets on current exposure to floods at district level.
- Geographic coverage of all datasets (% of all exposed areas).
- Number of reports detailing data collection and summarizing information.
- Number of policy and technical documents based on datasets and modeling scenarios.

Building Technical Capacity to Generate Vulnerability Assessments to Floods

- Number of technical staff trained to acquire competence in computer modelling techniques and able to perform Vulnerability Analysis (VA).
- Average staff performance on end-of-training comprehension tests.
- Proportion of ministries using datasets to generate vulnerability analysis or proportion of sectors covered by analysis at district level.
- Number of policy and technical documents incorporating results from VA's.
- Proportion of government investment/program documents using results from VA's as a priority-setting or screening tool.

Institutional Framework and Mechanisms to Support Adaptation and Adaptive Capacity

- Number of laws and regulations created or amended to clarify land and carbon property rights.
- Existence of a dispute resolution mechanism.
- Number of materials (presentations, briefs, papers) developed for legal literacy programs.
- Number of people participating in legal literacy programs.
- Number of individuals and community groups participating in Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of

[47] McCarthy, N., Winters, P., Linares, A. M. & Essam, T., 2012. Indicators to Assess the Effectiveness of Climate Change Projects, Washington DC: The Inter-American Development Bank

forests and enhancement of forest carbon stocks in developing countries (REDD+) financed projects.

- Average number of days and money spent in REDD+ project preparation.
- Total value of REDD+ projects and value per participant.
- Percentage reduction in production variability from forest-based activities and/or farm production at the forest margins.
- Number of early warning and health hazards dissemination outlets, by type of outlet (e.g. radio, newspaper, and website), geographic coverage, and level of disaggregation of system information (e.g. district-specific).
- Percentage languages used in dissemination materials of total number of languages spoken in district.
- Number of extension materials containing climate change-relevant materials.
- Percentage change in government budget allocations towards climate change information dissemination.
- Percentage reduction in property damage.
- Percentage reduction in mortality and in disease prevalence for diseases related to weather patterns (e.g. malaria, dengue).

Investment in Projects that Directly Support Adaptation and Improve Adaptive Capacity

- Percentage increase in the number of seed varieties developed, documented and made available in the market.
- Documentation of seed varieties and their characteristics.
- Documentation of procedures and partnerships created to transfer seeds either directly to farmers or to market traders.
- Percentage increase in number of seed varieties available in rural markets.
- Number of climate resistant seed varieties available in the market and percentage increase in use of climate resilient seed varieties.
- Percentage crop yield improvement in years of climate extremes.
- Percentage greater performance in average crop yields.
- Percentage decrease in proportion of rural and urban populations malnourished.
- Number of energy facilities built or retrofitted to withstand greater range of climate shocks.
- Percentage of total capacity built or retrofitted by type of facility and by “threat” level identified in vulnerability analysis.
- Percentage decrease in monetary damages to energy facilities due to climate extremes (adjusted for degree, or extent, of climate shock).
- Percentage decrease in customers losing access to energy due to climate shock-induced power failures.

12.11 Responsibility of Plan Implementation

Table 12-1 : Authorities Responsible for Implementation

S.No	Department	Designation
1	**Administration**	District Commissioner
		Assistant District Commissioner-I
		Assistant District Commissioner-II
2	**Irrigation**	District Irrigation Officer
3	**Agriculture**	District Agriculture Officer
4	**Health**	District Health Officer
5	**Education**	District Education Officer
6	**Social Welfare**	District Officer
7	**Livestock**	District Officer

Monitoring and Evaluation[48]

There are three ways to monitor and evaluate climate change adaptation and resilience:

- Measuring against project objectives
- Measuring against baselines
- Measuring against emerging understanding of good adaptation measures

a) Measuring against Baselines

Baseline comparisons can be used to monitor and evaluate the effectiveness of climate resilience initiatives. During this process, an initial measurement is taken (e.g., number of civic organization per 10,000 people). This measurement is then taken at different stages of the project to measure the effectiveness of strategies used to improve that particular indicator. This approach could be applied to resilience characteristics (e.g. flexibility). In order to do this, a more qualitative assessment (subjective scoring from 1 to 5) could be employed to create a baseline value.

b) Measuring against Definitions

Relatively straightforward definitions exist for climate adaptation, but in the context of resilience – with its emphasis on system level interaction and inherent qualities – this approach can prove to be much more difficult. How you define resilience is a key determinant in how the monitoring and evaluation approach will be adopted. For example, if resilience is defined as a decrease in post-disaster recovery time, specific indicators will be evaluated which would not be useful when concerned with the resilience characteristics with cities.

[48] *Brown, C., Shaker, R. R. & Das, R., 2018. A review of approaches for monitoring and evaluation of urban climate resilience initiatives. Environment, Development and Sustainability, 20(1), pp. 23-40*

c) Measuring against Project Objectives

As mentioned above, the objectives of a resilience program differ depending on the way resilience is defined and also at which phase of the project the assessment is being made. Alexander et al. (2016) define process as the ''inputs, throughput and outputs of the decision-making process,'' outcomes as ''the implementation of the outputs from the decision-making process'' and impact as ''the resulting effect of the decision-making process and outcome''. Similarly, Spearman and McGray (2011) use the following sequence: inputs, initiatives, outputs, outcomes, and impacts. Monitoring and evaluation can take place at each of these temporal locations (i.e., process, outcome, impact). Many people also advocate that monitoring and evaluation be carried out throughout the duration of the project rather than just at the beginning and the end of the project.

d) Key Principles of Monitoring, Evaluation and Reporting System[49]

- **Use of Mixed Methods**
  The monitoring and reporting system combines quantitative and qualitative methods to collect and analyze data, and generate knowledge and lessons in implementing the plan.

- **Ownership**
  District focal points for each sector (mentioned in the table above) are responsible for collecting, aggregating and submitting their reports annually to the District Administrative Unit.

- **Stakeholder Engagement**
  Empowering stakeholders and ensuring their active contribution to the monitoring and reporting process is a key feature of the monitoring and evaluation system. The monitoring and reporting system is rooted in the desire to maintain a programmatic approach in the implementation of the investment plans through projects and programs. It aims to engage the stakeholder groups, including government institutions at national, sub-national and local levels, as well as civil society, local communities and the private sector, in discussing progress with the implementation of the monitoring plan. The monitoring and reporting process will also be used to share lessons learned and discuss the challenges encountered with a view to identify feasible solutions.

- **Learning by Doing**
  Monitoring and reporting is an iterative learning process. It is expected that the quality of monitoring will improve over time as the authorities gain experience.

[49] Williams, A., 2016. Options for Results Monitoring and Evaluation for Resilience-Building Operations, Washington DC: World Bank Group

13.URBAN LAND MANAGEMENT

13.1 Introduction

Urban areas throughout the developing world are experiencing a problem in the supply of adequate and affordable serviced land to meet the housing needs of their rapidly expanding urban populations. As a result, low income groups who are mostly denied access to land due to shortfall in supply are forced to either seek for residential land through illegal means or to crowd into existing low income settlements, creating slum conditions. In Sindh, the shortfall in land supply arises not from the lack of virgin land but partly from the lack of resources, capacity to service the lands and land ownership by landlords and make them ripe for development and also partly from the use of ineffective and inappropriate land and land use policies and practices.

"Land management" is defined as an activity on the ground, using appropriate technologies in the respective land use systems. It is known by different names in different parts of the world; basically all are land management tools. In Pakistan land management is not being practiced till yet because of non-absence of policies / framework. Strong land owner opposition to forcible land acquisition, combined with extremely limited fiscal capacity has left the urban local bodies (ULBs) with very few options to develop well-planned and serviced urban land. Land pooling and reconstitution (LPR) is a tool that addresses both these issues by allowing the land owners to share the gain in the land value post provision of infrastructure and services. In lieu, the land owners pay betterment charges and contribute a part of their land to fund the infrastructure and services.

13.2 Goals

As most of towns in Sindh strive to become centers of global production, trade and development, they are increasingly concerned with improving their attractiveness for foreign direct investment and employment generation. For example, towns must have efficient spatial structures, adequate infrastructure and urban services, affordable housing and healthy environments. Effective urban land management is required to promote urban regeneration and development of new industrial and commercial districts, investments to upgrade and expand critical infrastructure systems, programs to enhance and protect the environment, and initiatives to upgrade social overhead capital (housing, education, healthcare).

13.3 Objectives

To implement these initiatives for Badin, there is a need to develop urban land management strategies to provide land for industrial and commercial development, to facilitate the formation of public-private partnerships, and to finance the provision of infrastructure and social overhead capital investments. Unfortunately, in many cities around the world such strategies do not exist and foreign investment is either stifled or, if it does take place, causes significant adverse side effects.

Cities and towns are crucial to the economic well-being of Sindh. For this, it is imperative that its cities and towns are transformed and pressures of new growth are dealt with so that they are more livable, efficient, and environmentally sustainable. Only then will the rapid pace of economic growth that Sindh is undergoing be sustained and the targets of environmental sustainability achieved. To manage the transformation of Sindh's cities and towns and effectively manage new growth requires effective urban planning protocols, processes, and institutions underpinned by effective legislation. To effectively manage the new growth implies that the agricultural land at the periphery of the cities and towns or smaller

settlements that are not yet "urban" is transformed to be made suitable for urban or non-agricultural uses. This essentially means that the irregular landholdings and plots will have to be given regular shapes; they must be ordered; each plot must be given access; infrastructure services such as water supply and drainage must be provided; land must be appropriated for providing roads, parks, social amenities, and low-income housing, development controls must be prescribed to result in a good quality-built form and levy development or betterment charges to offset the cost of developing the physical and social infrastructure. But most importantly, all of this must happen in a timely and such manner that it is acceptable to the "landowners" to avoid conflict in the growth management process.

13.4 Urban Land Management in Badin

Due to absence of provincial policy / framework for utilizing Urban Land especially in District headquarter towns, planners / development authorities have not carefully assessed the land use and transportation impacts of foreign investment. Due to non-existence / less effectiveness of Development authority mechanism, schemes / projects in private sector faces low exposure due to non-availability of basic facilities and monitoring mechanism by approval authority. As a result traffic congestion and infrastructure problems with the water supply and sewerage treatment are mounting.

Getting access to land for factories and commercial facilities is problematic, particularly in agricultural rich fertile land. Decades of inefficient allocation of land for industrial uses have literally blighted / dis-courage agricultural activities in the region. Unfortunately, a lack of clarity over land rights, corruption and bureaucratic inertia are impeding redevelopment. To compound matters, land use plans in many transition economy towns have not been planner to reflect the new land use requirements necessary to support post-industrial development.

To effectively exploit the benefits of inward investment flows and to ensure that social and environmental goals are met, the public sector needs to take the lead in planning and formulating urban land management strategies to promote sustainable urban economic development.

13.5 Land Pooling and Reconstitution

Simply put, in LPR, a number of small holdings are pooled together, a part of land is taken from each plot for provision of infrastructure and public facilities and the rest returned to the original land owners. It is basically a land management tool and is used all over the world under different names with slight modifications in their working.

Land Management Techniques

The strategies available for access to urban land could be through Guided land development for large areas; Land pooling and reconstitution; Land reconstitution / redevelopment; Acquisition for public purpose under the Land Acquisition Act, 1894; Joint Sector Model of land assembly and development; Transferable Development Rights (for built up areas); Saleable FAR and mixed use concept (for regeneration of inner city); Land Pooling and Redistribution Scheme.

A. Land Acquisition Act, 1984

In Pakistan, the Land Acquisition Act, 1894 gives the right for Government authorities to acquire parcels of land for the implementation of development projects. The origin of the practice of land acquisition

by public entities in Subcontinent goes back to 1824, when the British Government of India instituted regulations to facilitate urban land public acquisition from private owners. In fact, the obligation for owners to give up their land had to find a legitimate justification. The initial reason advanced to acquiring the land against their will was the need for constructing public buildings in Bengal provinces. These regulations enabled the British government to take possession of the land for the construction of roads and canals. From 1850 on, the scope of these laws was extended to other provinces in order to facilitate the operation of further infrastructure projects such as railways.

The Land Acquisition Act was edited in 1894. It harmonized and consolidated previous regulations into one single act, applicable within the whole British India. After Pakistan's independence in 1947, the Pakistan Government started using this act as a tool to purchase land at a lower price than that on the regular market, as it was meant to be used in the public interest. Several amendments have been made on this act, but its procedures have not changed.

B. Land readjustment / pooling

Land readjustment / pooling Land re-adjustment is a process whereby a public authority assembles numerous small parcels of raw land without paying compensation to the owners. The authority then sub-divides such assembled lands for urban use returning most of the building sites to the original owners in proportion to the value of their land contribution and permitting them the right of alienating such sites. The authority retains a portion of the assembled lands, applying them partly to provide civic amenities such as roads, parks and gardens or schools, and the remainder land for public sale to recover the cost of development. Thus, land re-adjustment acts as tool to achieve unified control over large areas of land and as an instrument of financing public service installations in the process of planned urban growth.

C. Guided Urban Development

The concept of Guided Urban Development (GUD) emerged in response to ad hoc, uncontrolled urban development with no regard to infrastructure services. It also aims to secure a limited availability of urban land for economically weaker sections. GUD has been practicing in India and developing world. The objectives of the scheme are as follows:

- Ensure provision of serviced plots for low income families at affordable prices (approximately 75% of total plots to be reserved for EWS / LIG); and
- Provide incentives to the land owner / private developer to participate in the provision of low income shelter by guaranteeing fair return on investments (profit of 20-30%).

13.6 City Survey

City survey is very important to manage land records for city. City survey will help to resolve present hassle in property transactions besides impeding planning & development. It will also help to resolve several issues i.e. Verification of ownership & Land grabbing issues respectively. Therefore it is suggested to conduct city survey & deal as separate project for Badin.

13.7 SWOT Analysis and Need Assessment

Strength	Weakness	Weakness	Threats
GOVERNANCE			
Planning Actors			
1. Politicians 2. Existence of Local government 3. Public Health Engineering Department	1. Lack of co-ordination among departments. 2. Weak technical support of government departments. 3. Weak financial base of departments. 4. Absence of development authority. 5. Shortage of technical staff, town planners, urban designer and policy makers at SMC, Regional Office of SBCA) 6. Overlapping of administrative functions 7. Need based ad-hoc planning system (day-to-day basis)	1. Strengthen the institutions, responsible for planning and execution 2. Immediate preparation of overall urban development strategy 3. Detailed land use zoning plan 4. Sectoral development plans 5. Detailed subject plans to regulate with density development. 6. Enhancing the role of local government on sustainable basis.	1. Inaccurate funding in development projects. 2. Wastage of local resources 3. Infrastructure development of poor quality, non-standard infrastructure. 4. Failure to provide technical support on issues required innovation. 5. May give birth to unwilling political interference and hidden interests based on nepotism and discrimination.
Coordination of Public Agencies / Department			
1. Town Committee / Taluka Municipal Administration 2. Politicians in charge 3. Participation of Sindh Building Control Authority (SBCA)	1. Weak co-ordination mechanism. 2. Lack of information sharing between line departments.	1. Preparation of local co-ordination standard procedures through policy frameworks. 2. Organizing events to make strong coordination between different departments.	1. Week coordination may give birth to poor governance. 2. Political interference
Local Council			

Strength	Weakness	Weakness	Threats
1. Availability of Town Committee.	1. Not actively pursuing the stated objectives.	1. With awareness and training of councilors the local councils can be more effective. 2. Workshops and meetings can enhance the coordination as well as clear the vision about development perspectives.	1. Confusion and chaos in the local development affairs at present until local bodies are established.
Financial Resources			
1. Institution and system are in place. 2. Regular provincial grants available for development project. 3. Programme based medium-term donors funding.	1. The council does not affectively generate funds. 2. Less efforts offer by local councils for revenue generation through available local resources. 3. High dependency on provincial grant. 4. Lacking capacity in collection and financial management. 5. Very low capacity for capital investment in development projects.	1. Self-sustainable financial system needs to be effectively introduced. 2. Development of self-reliance and suitable financial model. 3. Resource generation through PPP. 4. Exploitation of local potentials for resource generation. 5. To curb mismanagement and corruption.	1. Poor maintenance of infrastructure relating utility services. 2. Political pressure and financial leakages. 3. Lacking M&E and implementation of strict accountability measures during audits.

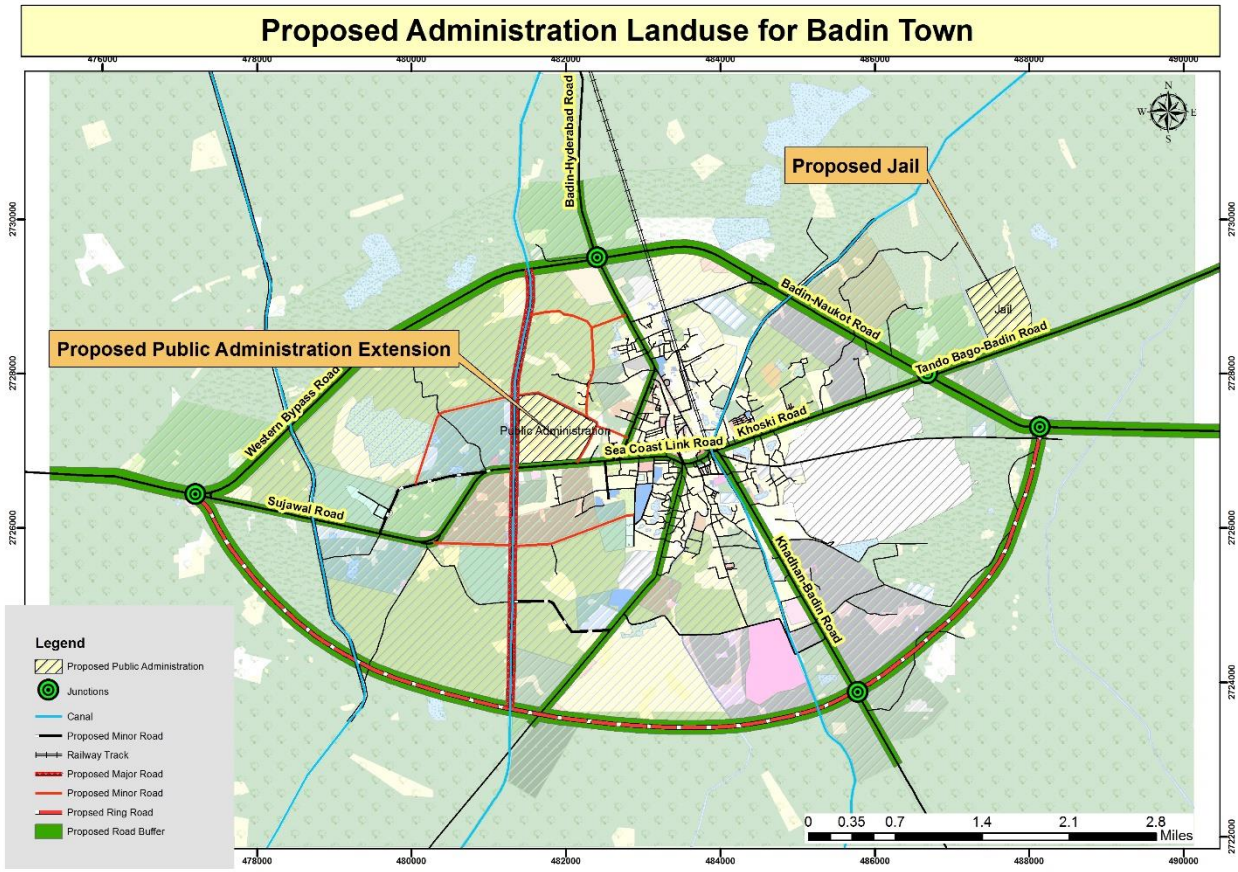


Figure 14-1 Future Administration Proposal of Badin

14.IMPLEMENTATION STRATEGY

This part of the report aims to provide an implementation framework for various development proposals recommended in 'Strategic Development Plan' to drive future growth of Badin town up to 2037, under the present governance framework of Government of Sindh.

14.1 Process of Implementation

The implementation of development plan is basically the process of prioritizing, phasing, coordinating, budgeting, scheduling, monitoring and making adjustments. There are number of management systems and charting procedures available to help a city manager to control this process. Issues that must be addressed in this regard are:

- Determine priorities within and among the sub plans
- Determine the phasing or sequence of activities among the sub plans.
- Address timeframes and budget availability
- Creating master schedule of activities with a progressive cost table so that the program can be appropriately expanded or contracted to meet implementation contingencies and budget fluctuations.
- Assign the various activities to be undertaken by qualified managers.
- Establish a timely monitoring and report system to keep the city officials and the public informed of progress and activities.

14.2 Implementation Agency

The office of the Deputy Commissioner and in case of Local Bodies/Local Government, the Chairman of district council and Mayor of metropolitan city will be the key implementation agency to execute Strategic Development Plan Badin 2037.

The Government of Sindh would take responsibility of implementing various development proposals by utilizing its maximum resources and by engaging various public offices of government of Sindh, established in Badin. The concerned agency must ensure that the overall process must go after following themes of implementation process.

a) ***The overreaching theme of the implementation of Strategic Development Plan Badin is:***

- Consultation with stakeholders during implementation at all levels.
- Decentralize decision making to the greatest extent possible.
- Promote transparency and accountability of decision making and implementation enforcement.
- Rationalize impacts where necessary;
- Ensure compensation to affected communities

- Enhance the quality of infrastructure provisions, promote utility services opportunities, and focus facilitating poor segments of society.

b) ***The principals that implementation process will follow:***

- The overall implementation process to be carried out in coordination with Town Planning and Urban Development Standards (Frameworks) in which redevelopment will be phased to prioritization;
- The implementation process will be based on updated planning codes and regulations;
- Special consideration will be paid to implement planning standards relating to disaster (Drought) preparedness in all development proposals/projects;
- Facilitate communities, government machinery, and other organizations of community to participate in overall implementation process;
- Educate stakeholders for technical assistance;
- Be comprehensive, coherent, and coordinate to avoid errors through continuous monitoring and evaluation
- Arrange supple of financial resources

14.3 Legal Frameworks

Local governance agencies dealing with any development proposal must ensure that all development related activities and their approval consent should be carried out in accordance with urban planning statutory frameworks of government of Pakistan operational at all government level levels. This includes all legal frameworks substantiated through the relevant articles of constitution of Pakistan and the primary act (LAA 1984) governing land acquisition and compensation.

a) ***National Level Policy Frameworks***

The constitution of the Islamic Republic of Pakistan passed on the 10th April 1973 and as modified thereafter, is the supreme law of Pakistan Government. This constitution provides legal cover to all laws and acts, particularly those embedded in chapter-3 pertaining with land acquisition, development and compensation.

b) ***State level Statutory Frameworks pertaining to planning and development Control***

On 14th Feb 2011, the government of Sindh notified the extension of the jurisdiction of Karachi Building Control Authority to the whole of Sindh. The five Regions of Sindh Building Control Authority notified by the Government of Sindh are: **Karachi, Hyderabad, Mirpurkhas, Sukkur & Larkana,** having the Head Quarter **Karachi. Thus, any development activity within juridical boundary of these districts must be carried out in accordance with the primary planning instrument ' *Sindh Town Planning and Building Control Regulation'*.**

c) ***Local Planning Instruments***

There is variety of regulations dealing with municipal services offences and penalties (Fines) in case of violation have been constituted in Schedule-VI (Section 139) 'Offences under the Act' Part-1 of Local Government Act-2013 (Third Amendment 2016) of Sindh Government.

In this regulation, various well defined public activity management and control regulations dealing with Public Health Safety, Land use Planning, Development Control, Encroachments, preparedness of safety measures from Natural & manmade disaster, quality of Drinking water, Solid Waste & Waste Water generating though multiple activities, Preservation of Heritage Sites, Open Space management and associated penalties, in case of violation, have been defined in detail.

d) ***Other relevant planning and design standard instruments***

There are varieties of other documents that support assessment of development proposals prior to implementation. e.g. 'National Reference Manual' - Ministry of Housing and works, Environment and Public Affair Division, etc.

If regularization requirements of any of development proposal is beyond the capacity of regularity frameworks mentioned above, the concerned agency dealing with development/implementation process in Badin may develop their own regulatory frameworks/ building codec's to regularize the status of development with consent of local/provincial government authorities, if necessary.

14.4 Institutional Enhancement

While implementing the Strategic Development Plan "SDP', the respective Provincial and District Government may seek technical assistance from all the line department i.e. DUP&SP, Local Development Authority, Municipal Corporation, secretariat of Commissioner and Deputy Commissioner.

The *'Urban Management Unit*' will mainly consist of urban planners supported by other technical staff; architects, project managers, engineers, finance officers and any other technical staff expert in their relevant fields.

The *'Urban Management Unit'* shall supervise and coordinate respective urban developers involved in development activities, conduct monitory audits, preparer evaluation and impact reports and will report to the head of respective governance agency.

Development authorities will be responsible for implementing new approved town planning and building codes with the assistance of office of head of respective governance agency. The office of district coordinator will be responsible for the overall coordination and monitoring and will provide support for development/redevelopment activity from federal to district level.

The district Urban Management Unit would also facilitate the office of district coordinator/ deputy commission for all development/ implementation related (a) needs identification (b) revision of annual plans (c) coordination (d) financial management and (e) monitoring of all development activities assigned to developers or government departments.

14.5 Implementation Schedule

Strategy:	**Programs/ Policies**
Balanced Urban Growth	**1. <u>Land Use Zoning</u>** Badin can be divided into northern and southern tracts, through Badin-Sujawal and Tando Bagio Road. Badin town is expanding in the north-east direction of railway track and the Badin-Sujawal Road. Most of the reserved residential areas are in the northern tracts. A land parcel located in the southern part of city, is designated for Badin small industrial estate. In the east side of southern part restricted area of Cantonment is also existing. **2. <u>Development Control</u>** Badin is an important health and educational center for the district, where the available facilities in the town are not only availed by the town dwellers but also by people of the neighboring areas. Badin is a collection centre for agriculture produce but it is not a market for which it depends on Karachi. Majority of the customers come from the vicinity and from the southern part of the district. Badin is a small industrial centre. It has sugar mills, handicrafts and light industries to meet local and surrounding needs. **3. <u>Transportation</u>** Badin is a sufficiently large transport centre. Its main link is with Hyderabad. A black top carpeted road also runs between Badin and Hyderabad which connects Matli and Tando Muhammad Khan on the regional linkage. Badin is connected with Karachi through road and railway tracks via Thatta. It is also well connected with the important towns by good quality roads; 93 Km (58 miles) east of Thatta, 98 Km (61 miles) west of Matli and 50 Km (31 miles) south east of Tando Mohammad

	Khan. The Runn of Kutch is located at about 53 Km (33 miles) to the south of Badin.
Responsibilities to Plan: Detailed Urban Design Strategy Development Assessment Impact of property Assessment Environmental Impact Study (EIA,IEE)	**Implementation Responsibilities:** Public Sector/ Private developers
Concerned Agencies: P & D Department Government of Sindh/ District Government/ Line Departments of local Government /Private Developers	**Time of Implementation:** Short Term (1 year to 5 Years) Long Term (5 years to 20 Years)

Strategy: **Future Transport Sector Development & Improvement**	**Programs/ Policies** **<u>(A)Traffic Management Program</u>** • Parking restrictions / Charged parking system • Control traffic movement specially cargo Qinqui and Pick-ups • Manage unidirectional traffic flow. • Enforcement of traffic rules • Improved road infrastructure and street furniture • Implementation of traffic bylaws **<u>(C) Congestion Reduction in Core Urban /CBD Area</u>** • Designated stands for Qinqui / rickshaws • Specified spaces for charged parking system • Alternate route for loading and unloading vehicles • Unidirectional traffic flow pattern • Removal of encroachments from major distributors • Development of infrastructure for pedestrian movement in old precinct.
Responsibilities to Plan • Enforcement of encroachment and road space improvement byelaws • Traffic corridors detailed study • Encroachment Removal & Relocation Study	**Implementation Responsibilities** International Development and Fund Supporting Agencies/Public Sector/ Private developers

• On Street & Off Street Parking Feasibility Study • Beautification plan	
Concerned Agencies Provincial Works & Services Department Government of Sindh./ District Highways Department/ Local Municipal Government/District Government/ Private Developers Line Departments of local Government.	**Time of Implementation** Short Term (1 year to 5 Years) Long Term (5 years to 20 Years)
Strategy: **Water Supply System Improvement**	**Programs/ Policies** • In the long term, piped water supply system for 100% population by 2037 • Installation of localize network in the planned housing schemes first and gradually cover the whole population in five year plans. • Reuse of treated effluent • Implementation of Tariff System for utilities through Water Metering (first for water usage above marginal consumption then in long run for all users). • Construction / Rehabilitation Of Water Supply Network • Improvement of Water Intake Works
Responsibilities to Plan • Need Assessment/Demand & Supply Study • Separate Master Plan for water supply and infrastructure development plan	**Implementation Responsibilities** Public Sector/ Private developers
Concerned Agencies Provincial / Local Government/ Public Health Engineering Department	**Time of Implementation** Short Term (1 year to 5 Years) Long Term (above 5 years)

Strategy: **Drainage & Sewerage System Improvement**	**Programs/ Policies** • Improvement and reconstruction of existing Combined system of sewerage and drainage (Phase-wise approach of replacing open drains with covered sewers of PE pipes). • Provision of wastewater treatment plant.
Responsibilities to Plan • Need Assessment/Demand & Supply Study • New Master Plan for Drainage & Sewerage services improvement.	**Implementation Responsibilities** Public sector / Private developers
Concerned Agencies Provincial / Local Government/ Public Health Engineering Department Municipality (MC)	**Time of Implementation** Short Term (1 year to 5 Years)

Strategy: **Solid Waste Disposal System Improvement**	**Programs/ Policies** • Immediate designation of walled Landfill *Site* with special attention for hospital waste disposal. • Collection and disposal of solid waste through specialized waste management companies.
Responsibilities to Plan • Disposal Generation Assessment Study • New Master Plan for Solid Waste Disposal System improvement.	**Implementation Responsibilities** Public / Private Sector
Concerned Agencies Provincial / Local Government/ Public Health Engineering Department Municipality (MC)/ Sindh Solid Waste Management Company SSWMB	**Time of Implementation** Short Term (1 year to 5 Years)

Strategy: **Improving Efficiency of Municipal Committee's (MC)** • Municipal Committee	**Programs/ Policies** • Acquire the required additional sanitary workers as per requirement. • Make Municipal Committee self sufficient • Strengthening Municipal Committee's Financial Capacity • In long term introduce 4R Solid Waste Management System (reduce-reuse-recycle-reject)
Responsibilities to Plan • Municipal Committee's Progress Assessment Study	**Implementation Responsibilities** Public / Private Sector
Concerned Agencies Provincial / Local Government/ Public Health Engineering Department Municipal Committee (MC)	**Time of Implementation** Short Term (1 year to 5 Years)
Strategy: **Improving Fire Fighting Capacity**	**Programs/ Policies** • Establishment of fire-stations to accommodate required number of fire vehicles. • Establish sub-stations at different locations to ensure short response time for the whole city. • Increase service efficiency through number of vehicles, dedicated staff and financial mechanism. • To ensure readiness of all vehicles with ample stocks of POL and spares.
Responsibilities to Plan Assessment on Municipality's firefighting potential	**Implementation Responsibilities** Public Sector
Concerned Agencies Badin Municipal Committee.	**Time of Implementation** Short Term (1 year to 5 Years)

Strategy: **Energy (Gas, Electric Power, Energy Generation through Alternate Resources)**	**Programs/ Policies** • Development of alternative energy resources such as wind, solar and bio-gas etc. • To Improve existing infrastructure of WAPDA • Solar street lights project • Energy generation through solar panel system for residential and commercial purpose. • Installation of Gas Network for entire DHQ Town.
Responsibilities to Plan • Demand and Assessment of various energy resources. • Feasibility study for solar Park • Rehabilitation of solarized street lights.	**Implementation Responsibilities** Public/ Public Private Partnerships
Concerned Agencies • SSGC-Sui Southern Gas Company • WAPDA • Developers	**Time of Implementation** Short Term (1 year to 5 Years)

Strategy: **Health Sector** Improve access to healthcare facilities & minimize the long journeys to access basic medical facilities	**Programs/ Policies** • Check and balance to accomplished existing health care projects. • Addition of 5385 beds to achieve the target of 2 beds per 1000 district population • Hiring of 2051 doctors and paramedical staff to cater future population. • Installation of incinerators.

Responsibilities to Plan	**Implementation Responsibilities**
• Health reforms	Public Sector and Welfare Agencies
Concerned Agencies	**Time of Implementation**
State Government/District Health Department. Provincial and District Health Department	Short Term (1 year to 5 Years) Long Term (above 5 year)

Strategy: **Education Sector Strategy**	**Programs/ Policies** • Short term plan provision of 265 classrooms at school and college level. • Repairing of school existing buildings with furniture • Training of teaching staff • 2526 additional classrooms (school and colleges) by 2037
Responsibilities to Plan • Education Infrastructure Improvement Mater Plan	**Implementation Responsibilities** Public Sector
Concerned Agencies Provincial Government/District Education Department.	**Time of Implementation** Short Term (1 year to 5 Years) Long Term (more than 5 years)

Strategy: **Improving Recreation Sector**	**Programs/ Policies** • Repairing of existing recreational facilities and completion of under construction work. • Introduce financial mechanism i.e. facility use charges, to generate revenue to make them self-sustaining. • Special arrangement for security, parking and alternate route during religious and cultural activities in the city. • Feasibility study for establishment of museum and research center and archeological sites.

	• Construct More Parks And Rehabilitate The Available Parks To Facilitate The People. • Construction of auditoriums and up-gradations for art councils • Conservation and Preservation of Heritage Sites.
Responsibilities to Plan • Provisions of New Recreation sites	**Implementation Responsibilities** Public Sector
Concerned Agencies Provincial Government / Culture, Tourism & Antiquities Department/ Government of Sindh/ District / Local Government / TMA	**Time of Implementation** Short Term (1 year to 2 Years) Long Term (More than 5 years)

Strategy: **Disaster Risk Management**	**Programs/ Policies** • Engage all stakeholders of entire district in overall disaster rehabilitation process. • Recognize the commitment of stakeholders and the need for collaboration across all levels of government, community, industry, commerce, and government owned corporations, private and volunteer organizations and local communities within all aspects of disaster management. • Aligned job responsibilities of key stakeholders with job descriptions mentioned in principal guidelines proposed in *Pakistan National Disaster Risk Management Act 2010*, *National Disaster Risk Management Guidelines* and *Disaster Risk Management Plan, Sindh.* • Ensure establishment of straight relationships, trust, teamwork, consultative decision-making and shared responsibilities among stakeholders.

	• Develop disaster risk assessment system through statistical information, risk maps, emerging hazards information and their affects. • Adopt measures of sustainability of local communities by utilizing local resources available to avoid post disaster cataclysms (dearth, theft, spread of epidemic diseases, etc.) • Promote economic sustainability after disasters.
Responsibilities to Plan • Identification of Disaster Prone Areas and Early warning and shelter homes • Development of Community Training and Drill Organization Manual and SOP. • Development Local stakeholders Roles and Responsibility SOP.	**Implementation Responsibilities** Public Sector and National /International Welfare agencies

Strategy **Economic Development Plan**	**Programs/ Policies** • Rehabilitation of Infrastructure in existing Small Industrial Estate (roads, street lights, parking for loading/unloading goods vehicles, etc.) • Increase strategic storage through construction of cold storage / Godowns for agro products to cater drought situation. • Provide good incentives near peripheries for shifting / re-location of whole sale markets from the inner city to reduce congestion. • Encourage Local Private Investors by giving them subsidies. • Consider changing trends of crop production through periodically revise Economic Policy Framework (feasible studies for economic potentials) • Ensure measures for security / risk recovery plan for economic zone. • Market and logistics should also be added to enhance trade and commerce. • Livestock and dairy sector needs to encourage and facilitated.

	• Centralize wholesale markets to create connectivity with regional markets. • Drought measures
Responsibilities to Plan Feasible studies for economic potentials	**Implementation Responsibilities** Public /private developers
Concerned Agencies Provincial Government/ District Government/ Local Government/ Chamber of Commerce and Industries	**Time of Implementation** Short Term (1 year to 5 Years) Long Term (5 years to 20 Years)

Annexure – A

Sustainable Development Goals Acceleration Plan

Sustainable Development Goals (SDGs) Acceleration Plan
Badin DHQ Town

Sustainable Development Goals:

The Agenda 2030 comprises of Sustainable Development Goals (SDGs) which are a call for action by all countries – poor, rich and middle-income – to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, housing and job opportunities, while tackling climate change and environmental protection.

The 17 goals of SDGs provide a direction for targeting human prosperity and have a global scope – applying on both developed and developing countries. SDGs have come into action since the beginning of 2016 and will continue as the leading global development agenda until 2030. The SDGs targets are defined as aspirational, with each government setting its own national/subnational targets while considering its circumstances and priorities. In consultation with stakeholders, governments are also to decide how to incorporate SDGs in its planning processes, policies and strategies, and to recognize the link between sustainable development and other relevant ongoing processes in the economic, social and environmental fields[1].

Pakistan signed the international agreement on the 2030 agenda in September 2015 during the United Nations General Assembly (UNGA) Session for sustainable development, committing to achieve the 17 SDGs between 2016 and 2030. In February 2016, under a unanimous resolution, the National Assembly of Pakistan endorsed SDGs as Pakistan's national development agenda. The country has thereafter made rapid progress in adopting and formally launching the 17 SDGs.

SDGs in Sindh:

In line with the National Initiative on SDGs, Government of Sindh (GoS) has also made focused efforts to support the mainstreaming, localization, and implementation of the 2030 Agenda through a support project for SDGs implementation in Sindh, jointly-funded by the GoS and United Nations Development Programme (UNDP), with the aim to address socio-economic challenges in the province and steer it in a progressive direction towards achievement of the SDGs. Under the project, the SDGs Support Unit Sindh has been established in Planning & Development Department, Government of Sindh with effect from May 2017. The Unit contributes towards accelerating progress on SDGs in the province by working through following four approaches:

[1]United Nations Development Group, Reference Guide to UN Country Teams -Mainstreaming the 2030 Agenda for Sustainable Development, March 2017 Update

Policies and Plans	Data Reporting	Financing	Innovation
Mainstreaming SDGs in local development plans and strategies clearly delineating the resource requirements.	Strengthening coordination, reporting and monitoring mechanisms for SDGs	Financing flows increasingly aligned with 2030 Agenda	Supporting integrated and innovative approaches to accelerate progress on SDGs on priority areas.

GoS has also taken the crucial step towards mainstreaming and localizing SDGs in the province by approving prioritization of SDGs in the immediate, medium and long-term for the province. The prioritization has been done by considering severity of development issues and challenges, resource availability, and Sindh's economic and social endowments, value for money, and magnitude of impacts, in line with Sindh 2025 vision and other policies and strategies.

Sindh's SDGs Priorities

Ranking of Priorities	Goal #	Sustainable Development Goals (SDGs)	Immediate Priorities	Intermediate Priorities (Up-to 2025)	Long-term Priorities (Up-to 2030)
1	Goal 4:	Quality Education			
2	Goal 3:	Good Health and Well Being			
3	Goal 6:	Clean water and Sanitation			
4	Goal 7:	Affordable and Clean Energy			
5	Goal 2:	No Hunger			
6	Goal 8:	Decent work and Economic Growth			
7	Goal 9:	Industry, Innovation and Infrastructure			
8	Goal 16:	Peace and Justice			
9	Goal 11:	Sustainable cities and communities			
10	Goal 1:	No Poverty			
11	Goal 12:	Sustainable Consumption and Production			
12	Goal 10:	Reduce Inequalities			
13	Goal 5:	Gender Equality			
14	Goal 17:	Partnership development			
15	Goal 13:	Climate Change			
16	Goal 14:	Life Below Water			
17	Goal 15:	Life on Land			

The above table indicates that the SDG Goal # 4, 3, 6,7,2 and 8 are on the Immediate priority, whereas Goal # 1,9,16,11,12 and 10 are on Intermediate priority i.e. upto year 2025. The remaining goals which are Goal # 5, 17, 13, 14, and 15 will be on the Long term priority i.e upto year (2030).

Urban Development Planning and the SDGs:

Today's common urban development challenges like affordable housing, provision of basic services, municipal functions, controlling crime, poverty, disease and the exhaustion of natural resources do not respect regional borders or limits between the built and the non-built domains. Therefore, the scope of urbanization should always include the livable environment while also considering the regional dimension. In this connection, the rigorous consultation and analysis being done by GoS to prepare Development Master Plan of 14 DHQ Towns of Sindh, it is being realized with even more significance that sustainable development cannot be achieved without significantly transforming the way we plan, build and manage our urban spaces. The rapid growth of cities resulting in rising population and increasing migration that has led to a boom in urban areas and slums, is becoming a more significant challenge for urban areas.

Under the contract of the preparation of development Master Plan of 14 DHQ towns, SDG Acceleration plan was not part of the approved TORs but keeping in view the Sindh government's initiatives to mainstream SDGs targets in provincial planning (taking Islamkot as a model SDG Taluka) the Directorate and Consultant after due consultative process felt the need to include brief SDG Acceleration Plan as part of Development Master Plans. Accordingly in consultation with SDG unit Sindh, SDG 11 was selected for SDG Acceleration Plan for 14 DHQ towns since is pertinent to urban planning and development.

SDG 11 – *Sustainable Cities and Communities* sets the basis for urban-planning techniques and policies for the future. For a tangible acceleration towards achievement of SDG 11, simultaneous interventions will need to be executed directly through urban-planning interventions. While this involves investments in public transport, housing, creating green public spaces and improved urban planning and management in participatory and inclusive ways, an in-depth review of SDG 11 targets reveals a much stronger interlinkage with other SDGs such as poverty, health, education, clean energy, provision of basic services (social services as well as urban municipal services), etc. thereby generating a holistic societal impact, which is of prime importance in the context of Agenda 2030.

Using the key mechanism for periodic updating of the Development Master Plan after every five years, the SDGs Acceleration Plan also proposes embedding SDGs agenda targets against projects and schemes designed at local level and assesses the available and potential financing flows in context of future opportunities. Therefore, the targets and indicators of

SDG 11 – Sustainable Cities & Communities is being reviewed against the Master Plan, along with identification of supportive plans, policies and interventions.

The SDGs Acceleration Plan table below explicitly underlays the outline for how the Master plan of the town addresses the targets and indicators under SDG 11 – Sustainable Cities & Communities. The plan also takes note of the local social and economic data to identify services provision gaps at the local level, as well as key challenges at district level.

SDG Acceleration Action Plan - Badin DHQ Town

SDG Goal 11 : Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable				
	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing	[2]11.43% of the urban town population lives in katcha houses	- Increase in proportion of small size plots (Plot size will be depend on land value) could be made for low income groups in all new housing schemes. - Affordable housing program for low income group in different phases up to 2037, through one window operation (including technical guidance, easy loan provisions, legal procedures)	Sindh Katchi Abadis, Squatter Settlements & Slums Policy - The process of regularization and up-gradation of the pre-1985 katchi abadis shall continue as per current policy. However, katchi abadis, which are hazardous by virtue of being close to railways tracks or located under high tension power lines, or are on or close to the riverbeds, or on lands needed for operational /security purposes, need to be relocated at appropriate places by LOAs. - Formation of new katchi abadis shall not be allowed and shall be discouraged by exercising strict development controls in all urban areas. - Formation of Resettlement Plans - Resettlement plans shall be prepared by the concerned Land Owning Agencies (LOAs) in consultation with

[2] Data provided by Sindh Katchi Abadis Authority, December 2019. Katchi abadi is defined as by Katchi abadi authority

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
					affected communities for shifting of katchi abadis dwellers who fall within hazardous or security/operational zones. These plans shall primarily be on a self-financing basis. - The internal infrastructure and services shall be provided on incremental basis depending on the needs and priorities of the residents to make them affordable and cost effective. Trunk infrastructure and services shall be provided by public sector organizations and the cost shall be met from Government exchequer
	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	80% people have access to public transport.[3]	- Improve road design to make safer roads. - Prevent encroachments on footpaths through litigation. - Environmental Impact Assessment (EIA) should be mandatory for all transportation projects. - Declaring private vehicle free zones, especially in peak hours, in CBD areas to reduce noise and air pollutions.	Sindh empowerment of Persons with Disabilities' Act, 2018[4] i. Universal access to destination: All destinations served by the public road system shall be accessible by pedestrians and by drivers of all vehicles (including bicycles), except that vehicle operation may be restricted for reasons of excessive weight, noise or size, or extraordinary potential for damage to property or person ii. Equal Right of use: People's right to use that portion of a street designed for travel is not diminished by less weight, less size, or less average speed associated with their travel mode. Demand actuated tra-c signals must detect and serve a

[3] Socio Economic Survey 2017
[4] https://depd.sindh.gov.pk/sindh-empowerment-of-persons-with-disabilities-act-2018

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	vulnerable situations, women, children, persons with disabilities and older persons			- Reduce traffic growth and congestion by achieving a mode shift. - Enhance institutional efficiency to improve service delivery. - Dualization of main arteries - Improve road design to make safer roads. - Prevent encroachments on footpaths through litigation. It is suggested that necessary provision of the above recommendation may be mandated in the laws and regulations of SBEA and other agencies which drafting the buildings and highway regulation	diversity of users including bicycle operators in the roadway and pedestrians using crosswalks. iii. Accessible surfaces: To the extent practicable, travel surfaces should accommodate travel on foot with minimal trip hazards and via common assistive devices such as wheelchairs. Roadway surfaces should be as clear as possible of hazards for narrow tires such as bicycle wheels. iv. Crossable Roadways: Crossing distances at non-signalized access locations must not exceed the distance that can be covered at walking speed before tra-c may arrive from beyond sight distance, or during reasonable gaps in roadway tra-c. Refuges provided to reduce crossing distances should be large enough to store assistive devices such as wheelchairs and strollers. Tra-c signal timing should provide adequate clearance intervals for safe crossing by pedestrians and slow vehicles.

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate 11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	Baseline will be established at the start of implementation of Master plan. Vision formulation exercise through multiple consultative workshops were conducted to establish a shared and common vision for the development of Badin DHQ town in the future.	o The total extent of the area included in the overall proposed Badin Master Plan is 16,000 acres approx. for a population of 207,400 by 2037	Sindh Colonization of Government Lands Act 1912 and Disposal of Government Lands Rules, 2005.[5] National Housing Policy 2001[6]
	11.4 Strengthen efforts to protect and safeguard the world's	11.4.1 Total expenditure (public and private) per capita spent on the	Baseline will be established at the start of	• Protection of historical places and cultural heritage	Heritage act for policies 2012[7]

[5] http://sindhlaws.gov.pk/setup/publications_SindhCode/PUB-16-000113.pdf
[6] http://mohw.gov.pk/mohw/userfiles1/file/National%20Housing%20Policy.pdf
[7] https://antiquities.sindhculture.gov.pk/index.php/about-us/acts/343-heritage-act-1994

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	cultural and natural heritage	preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)	implementation of Master Plan.		(2) An agreement under this section may provide for the following matters or 'for such of them as it may be found expedient to include in the agreement--- (a) the maintenance and custody of the protected heritage and the duties of any person who may be employed to watch it; (b) the restriction of the owner's right to destroy, remove, alter or deface the protected heritage; (c) the facilities of access to the public or to any portion of the public and to persons deputed by the Committee to inspect or maintain the protected heritage; (d) the notice to be given to Government in case the land on which the protected heritage is situated is offered for sale by the owner, and the right to reserve by Government to purchase such heritage, or any specified portion of such heritage, at its market value; (e) the payment of any expenses incurred by the owner or Government in connection with the preservation of the protected heritage; and (f) any matter connected with the preservation of the protected heritage which is a subject of agreement between the owner and Government.

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	11.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 population	Sindh Data [8] No of deaths (1988-2013) = 241 No of People effected (1988-2013) =24,096,173 Deaths per 100,000 population = 0.2491 Affected people per 100,000 population = 241	• The DSM, PPHI shall also be responsible for providing medical cover to the IDPs in the catchment area of BHUs assigned to them particularly, and will perform their due role in supplementing the overall medical cover provided by the District Health Department. • National risk assessment would identify highly vulnerable districts and be complemented by higher resolution work at local level to diagnose the underlying causes of risk, explore concrete risk reduction options and inform development planning and prioritization exercises and/ or disaster preparedness planning. • Arrange medical teams for providing medical cover to the IDPs settled in any relief camp. • Fumigate the affected areas and areas at risks of spread of any of epidemic disease.	National Disaster Risk Reduction Policy 2013[9]

[8] PDMA (2017)
[9] http://www.pdma.gos.pk/new/resources/Sindhidrr-policy.pdf

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
				• Ensure that all ambulances are in working order and road worthy conditions. • Ensure vacant possession of all schools buildings at the time of emergency for setting up relief camps. • Ensure sanitation and cleanliness as well as clean drinking water facilities wherever possible at all school buildings declared as relief camps through by binding down their concerned Headmasters. • The creation of an integrated multi-hazard damage loss data-base is therefore a prerequisite for systematic vulnerability and risk monitoring	
	11.6 By 2030, reduce the adverse per capita environmental impact of cities,	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of	[10]Present Total solid waste generation in Badin DHQ town is 50 tons per day. Regular collection	- The collection and disposing of solid waste is the responsibility of the TC. - The collection system needs to be made more effective and efficient. - Town Municipal Committees has already initiated some work on	THE SINDH SOLID WASTE MANAGEMENT BOARD ACT, 2014 [11]

[10] Municipal Committee Badin
[11] http://www.pas.gov.pk/uploads/acts/Sindh%20Act%20No.IV%20of%202014.pdf

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	including by paying special attention to air quality and municipal and other waste management	total urban solid waste generated, by cities	by municipal is about 50-60%	biomedical-waste management. It should immediately start segregation practice for biomedical waste collection system. - Techno-economic feasibility and detail study of characterization of waste is proposed on basis of the policy guidelines. - Develop integrated solid waste management system keeping in mind the method, procedure and design at front end, middle end and back end, based on best possible public health practices and environmental protection laws/rules. - Industrial waste disposal should be treated seperately and safely	
	11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and	Only 0.95% (22.3 acres) out of total 2,239 (9.06 Sq KM[12])acres park area is available in Badin	• Existing open spaces in core urban area should be restored and maintained. New open spaces should be identified and created. • Development and preservation of cultural heritage	Adopt-a-park policy 2019 (PPP unit, Finance dept. GoS) is still in progress

[12] Based on Landuse Calculations

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	particular for women and children, older persons and persons with disabilities	persons with disabilities		• Cater the problem of Shortage of water facility to maintain green spaces, green belts and trees plantation. • Availability of sports infrastructure. • Provision of infrastructure to accommodate visitors into cultural events	
	11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city	Through inclusive and participatory development of SDP and collaborative implementation, the target for development plan integration is achieved	• Build a local / district / regional transportation system. • Rehabilitation of existing roads should be scratched from its compaction level and reconstruct as per specification of design perimeters. • Discourage direct link roads with bypass • The Consultant suggest that the Master Planning should be reviewed every five years to estimate the land use and area requirement according to the growth rate and economic investment	• Preparation of Development master plans of DHQ towns by Govt of Sindh • Poverty Reduction Strategy for Sindh approved by cabinet 2018 The key conceptual underpinnings of this strategy are:[13] • The policy is focused on creation/facilitation of rural hubs: • Using principles of agglomeration to support and drive growth • Focusing on those interventions that will have a catalytic effect • Consolidation of services, for improved service deliver and better impact.

[13] Poverty Reduction Strategy for Sindh

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
					The combined effect aims to provide improved facilities, services and opportunities for households in the surrounding cluster of villages served by the hub
	11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and	11.b.1 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030a 11.b.2 Number of countries with national and local disaster risk	Provincial policies and strategies in placed	National risk assessment would identify highly vulnerable districts and be complemented by higher resolution work at local level to diagnose the underlying causes of risk, explore concrete risk reduction options and inform development planning and prioritization exercises and/ or disaster preparedness planning. • Arrange medical teams for providing medical cover to the IDPs settled in any relief camp. • Fumigate the affected areas and areas at risks of spread of any of epidemic disease. • Ensure that all ambulances are in working order and road worthy conditions.	National Disaster Risk Reduction Policy 2013[14]

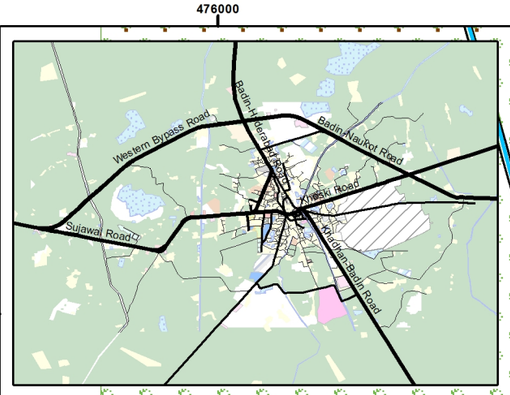
[14] http://www.pdma.gos.pk/new/resources/Sindhidrr-policy.pdf

SN	SDG Target	Indicators	Baseline Survey	Supportive Strategies given in SDP	Policies
	develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	reduction strategies		• Ensure vacant possession of all schools buildings at the time of emergency for setting up relief camps.	

Annexure – B

Atlas

Proposed Master Plan for Badin Town



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N W E S

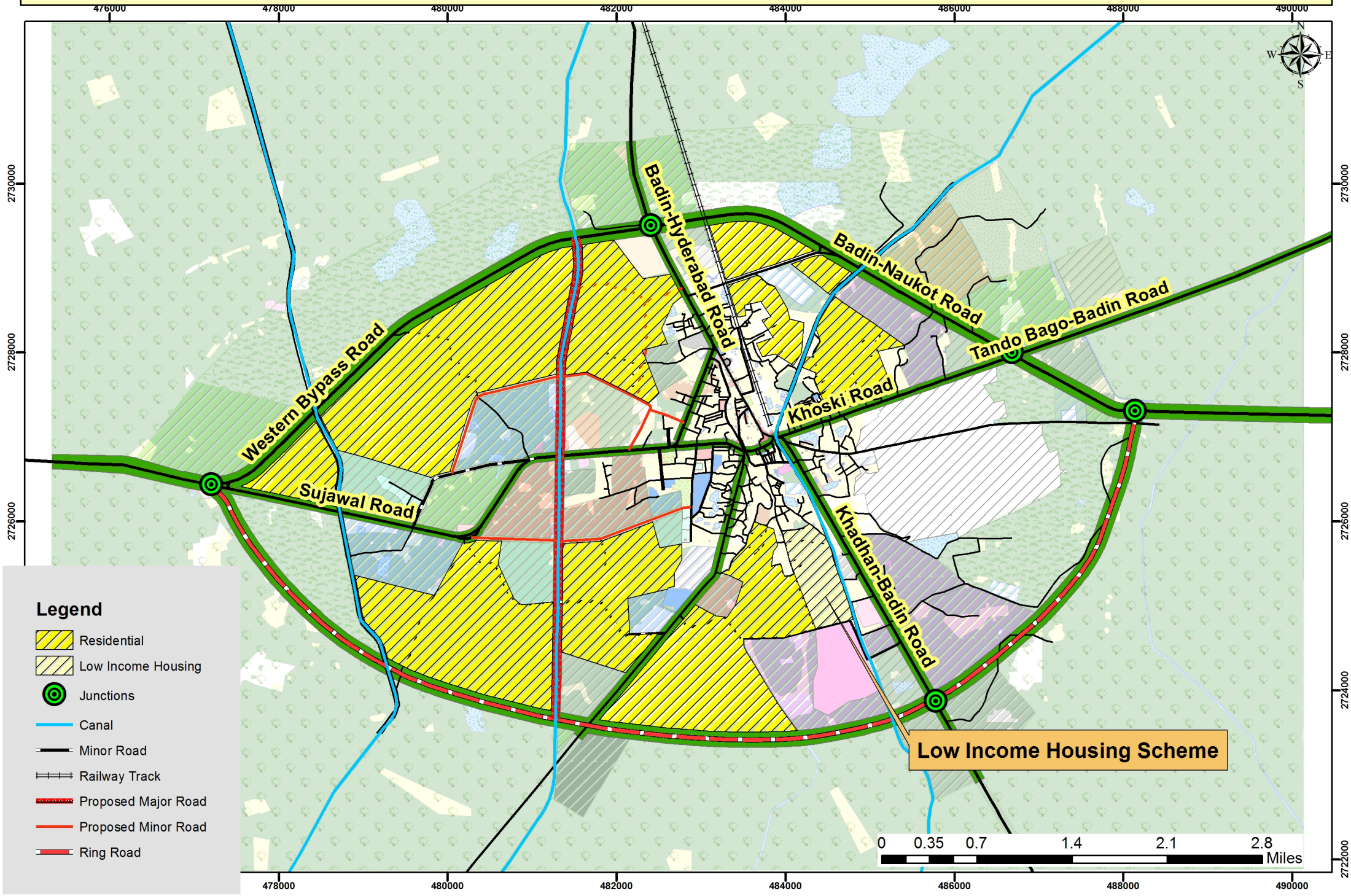
Agricultural Fields
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Agriculture Reserved
Agriculture Reserved
Cultural Complex
Sports Complex
Emergency Reserved
Cattle Park
Jail
Bus Terminal
Residential
Residential
Residential
Residential
Residential
Residential
Residential
Residential
Residential
Extension of WS
Warehouse
Recreational
Truck Terminal
Trade and Commerce
Green Area
Graveyard
Extension of Grid Station
Amusement Park
Eucational Zone
Public Administration
Extension of WS
Green Area
Religious
Health Extension
Central Park
Tourism
CBD
Education Extension
Health Extension
Educational Zone
Health Zone
Religious
Low Income Housing
Technical Services
Sub-Commercial
Education Extension
New Industrial Zone
Extension of Small Industrial Estate
Industrial Extension
Truck Terminal
Graveyard
Proposed landfill Site
Green Area
Proposed STP
Graveyard

0 0.375 0.75 1.5 2.25 3 Miles

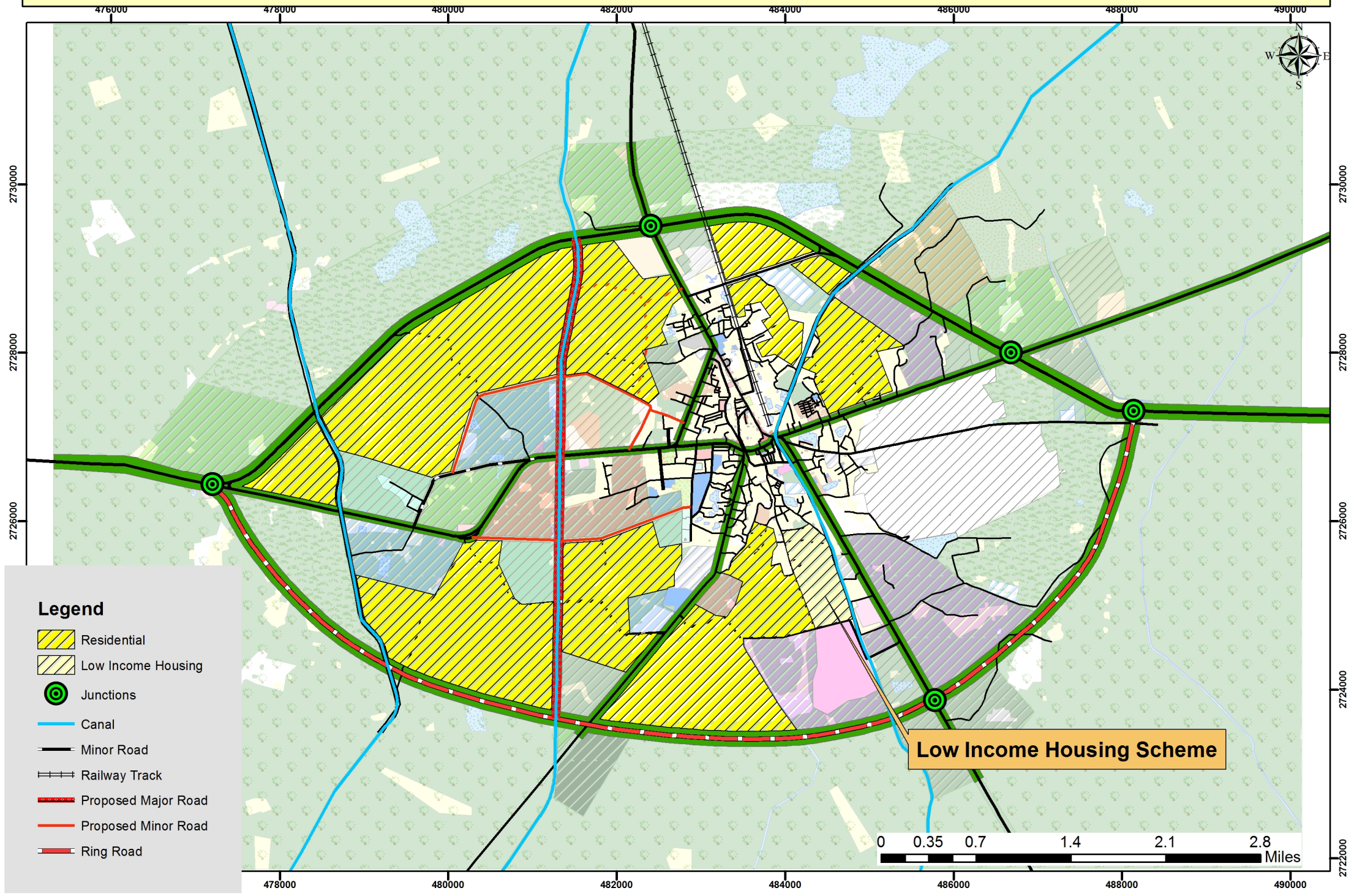
Legend

- Junctions
- Canal
- Minor Road
- Railway Track
- Proposed Major Road
- Proposed Minor Road
- Ring Road
- Agricultural Fields
- Agricultural Reserved
- Catlle Farm
- Commercial
- Economic
- Educational
- Emergency Reserved
- Graveyard
- Grid Station
- Health
- Landfill Site
- Public Administration
- Recreational
- Religious
- Low Income Housing
- Residential
- STP
- Transportation
- Water Supply
- Major Road
- Minor Road
- Street

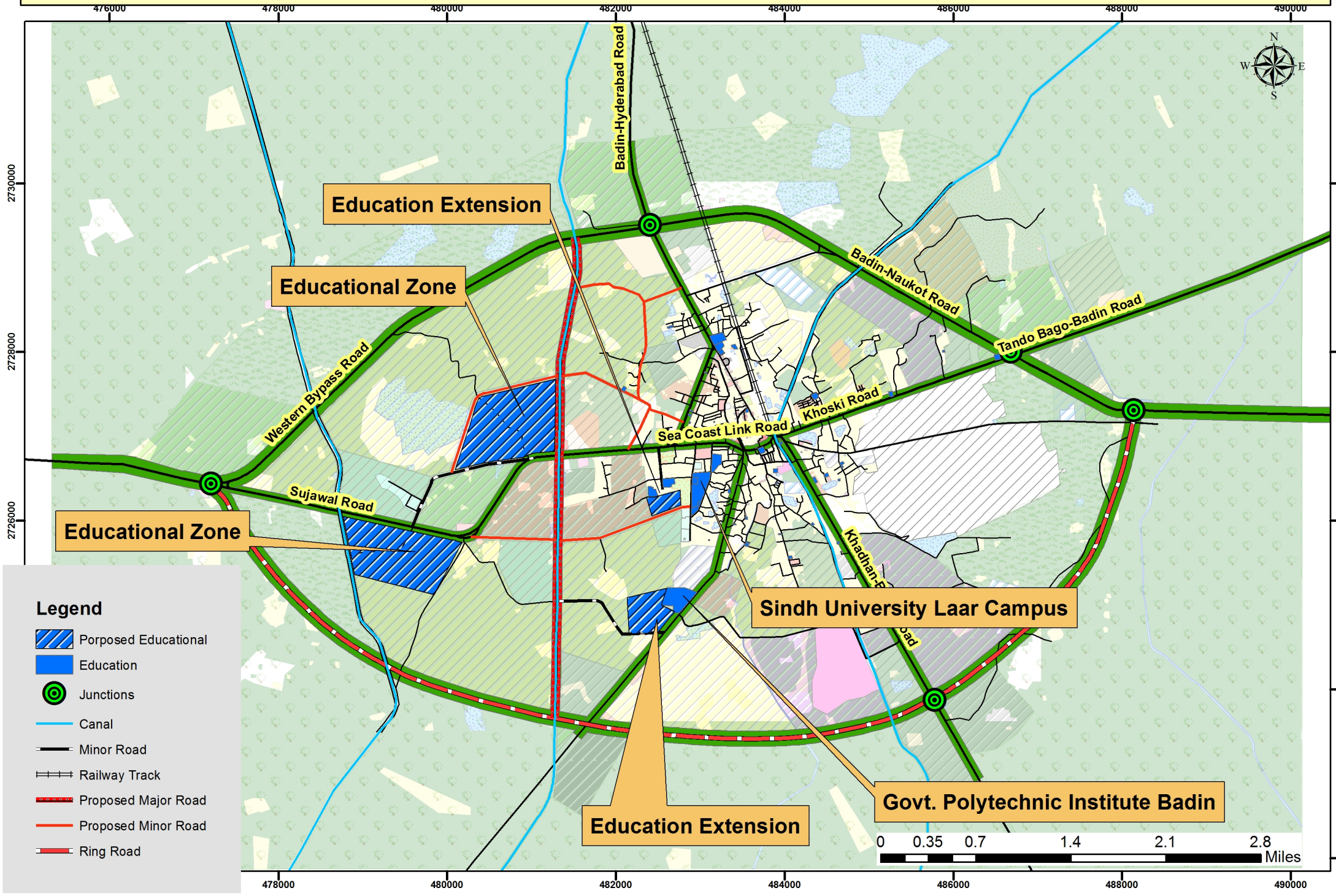
Proposed Residential Landuse for Badin Town



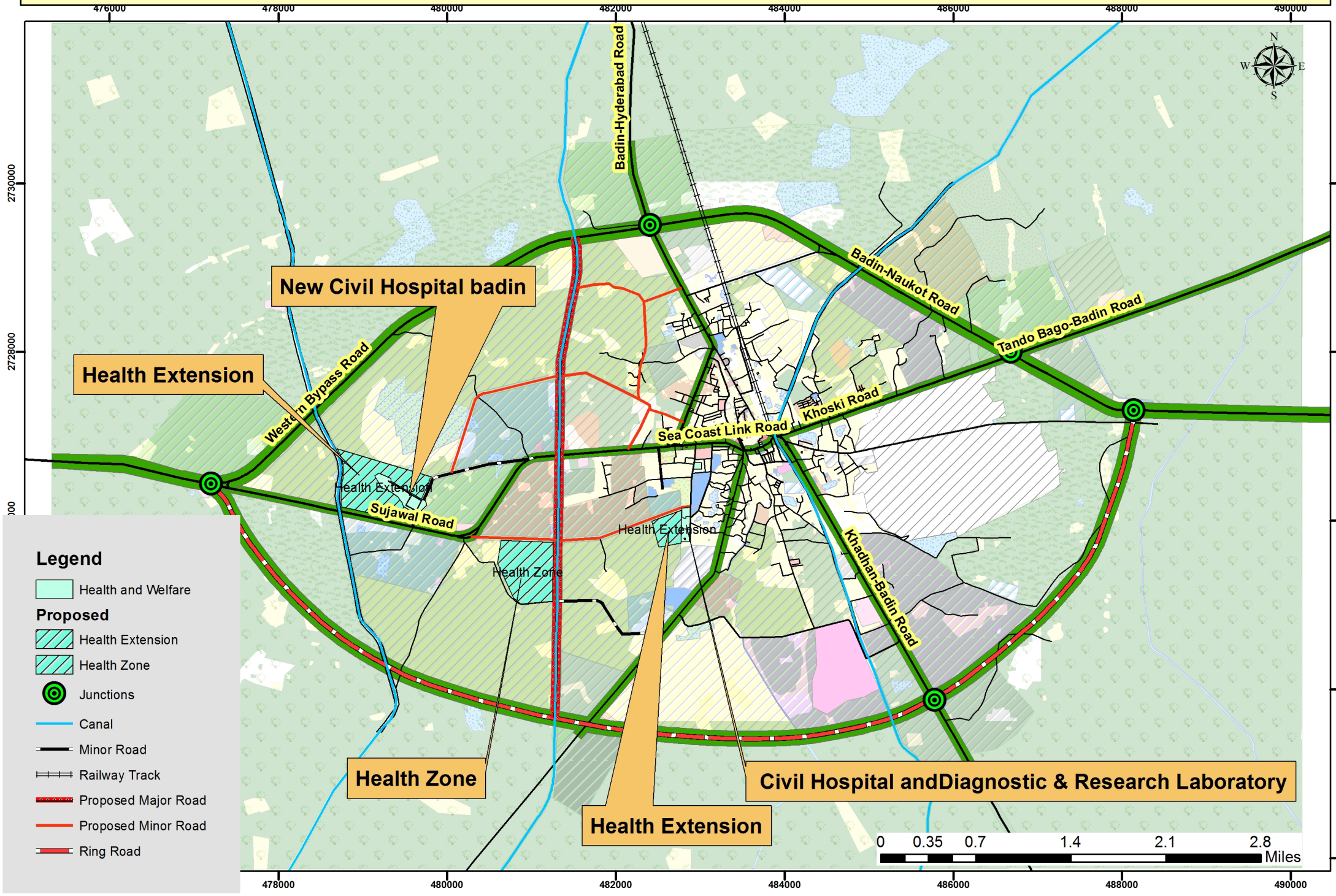
Proposed Residential Landuse for Badin Town



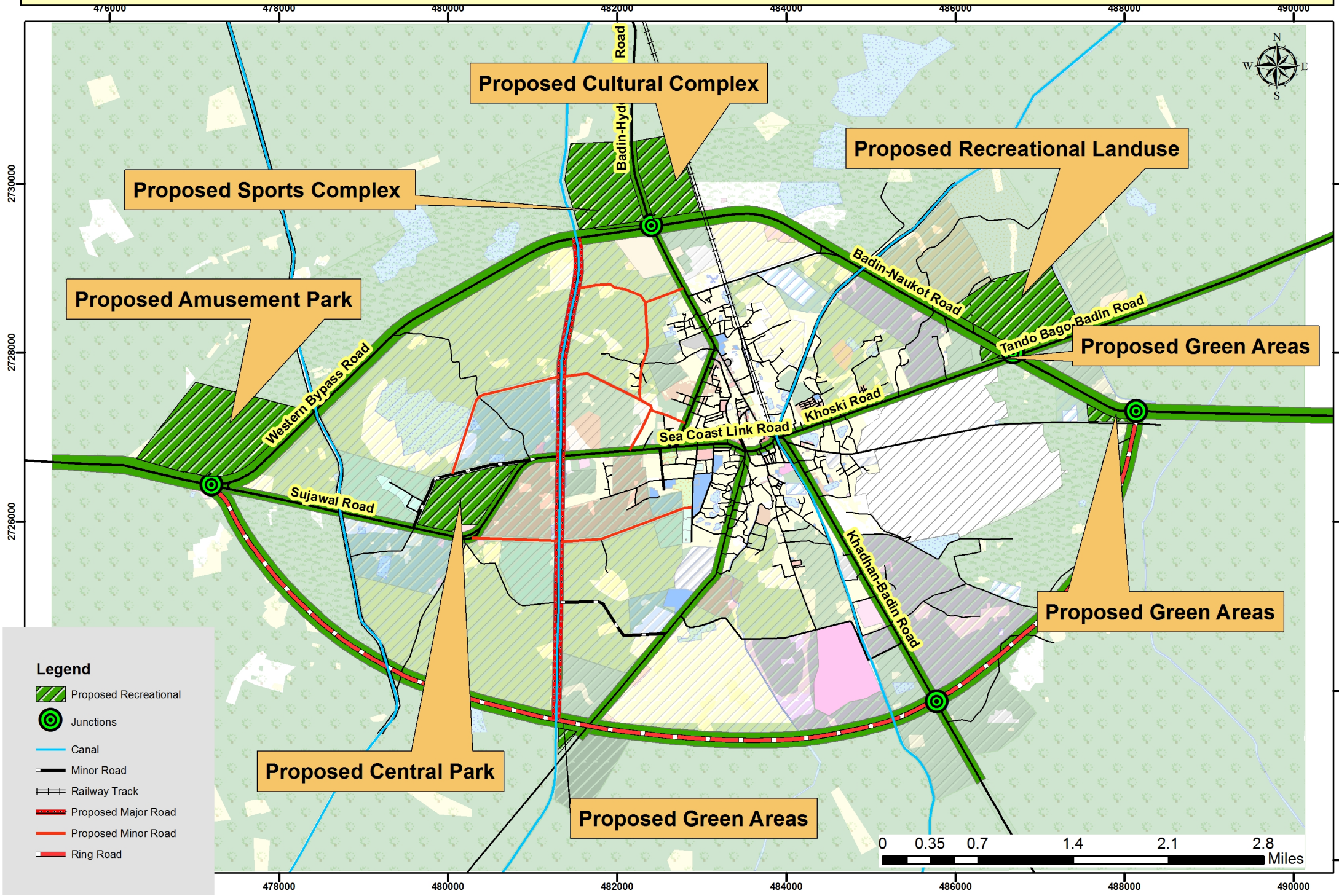
Proposed Educational Landuse for Badin Town



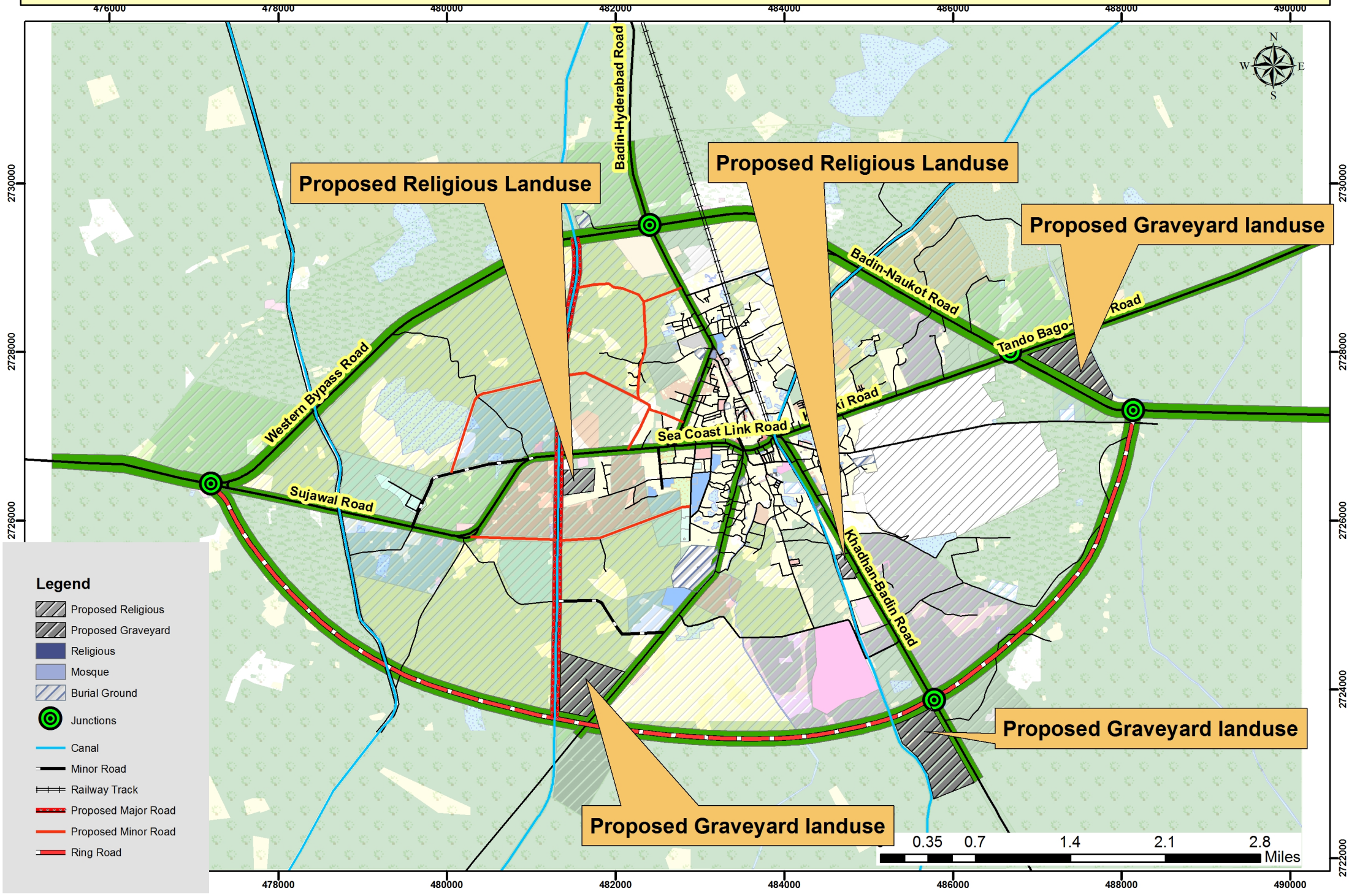
Proposed Health Landuse for Badin Town



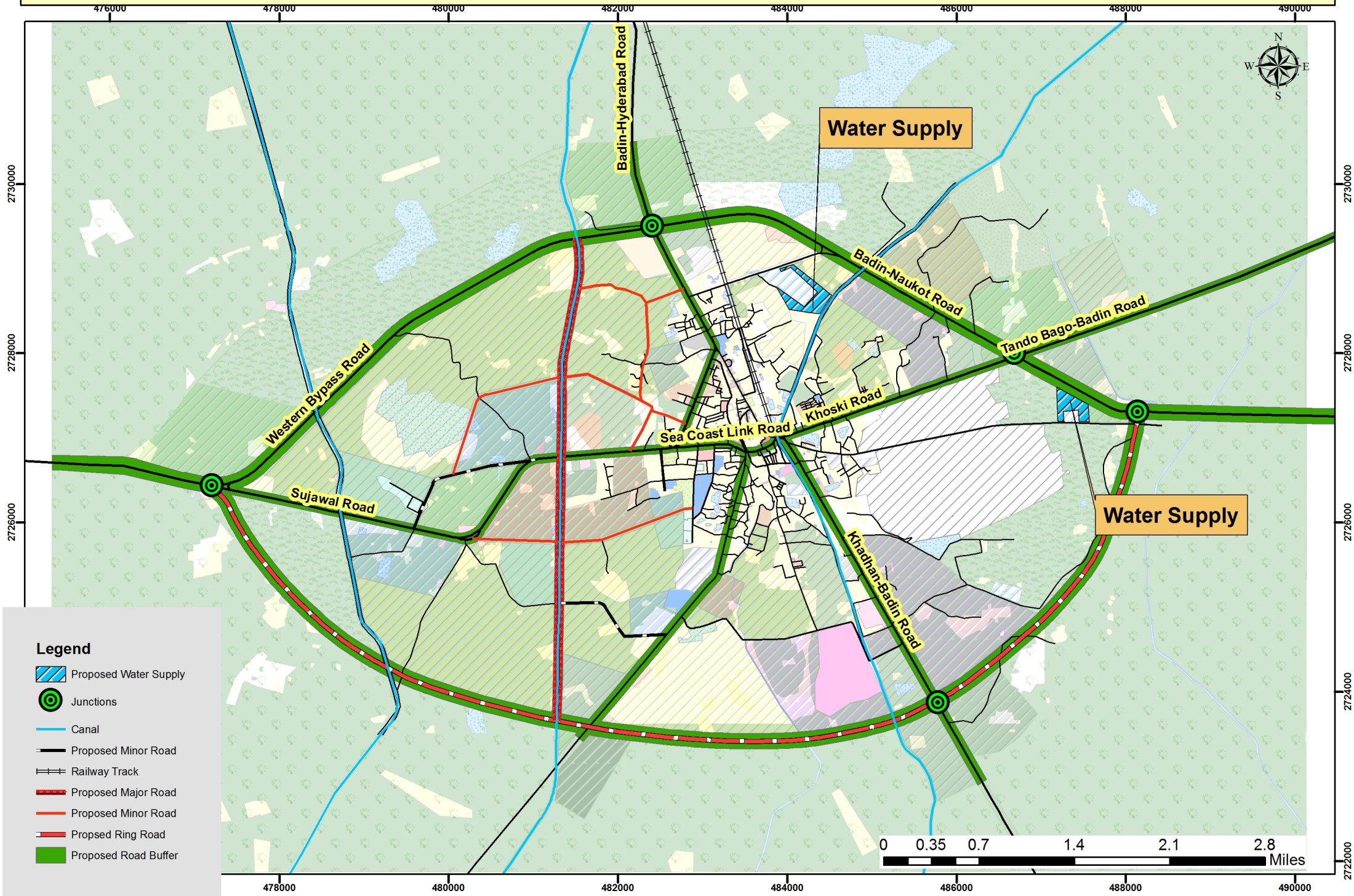
Proposed Recreational Landuse for Badin Town



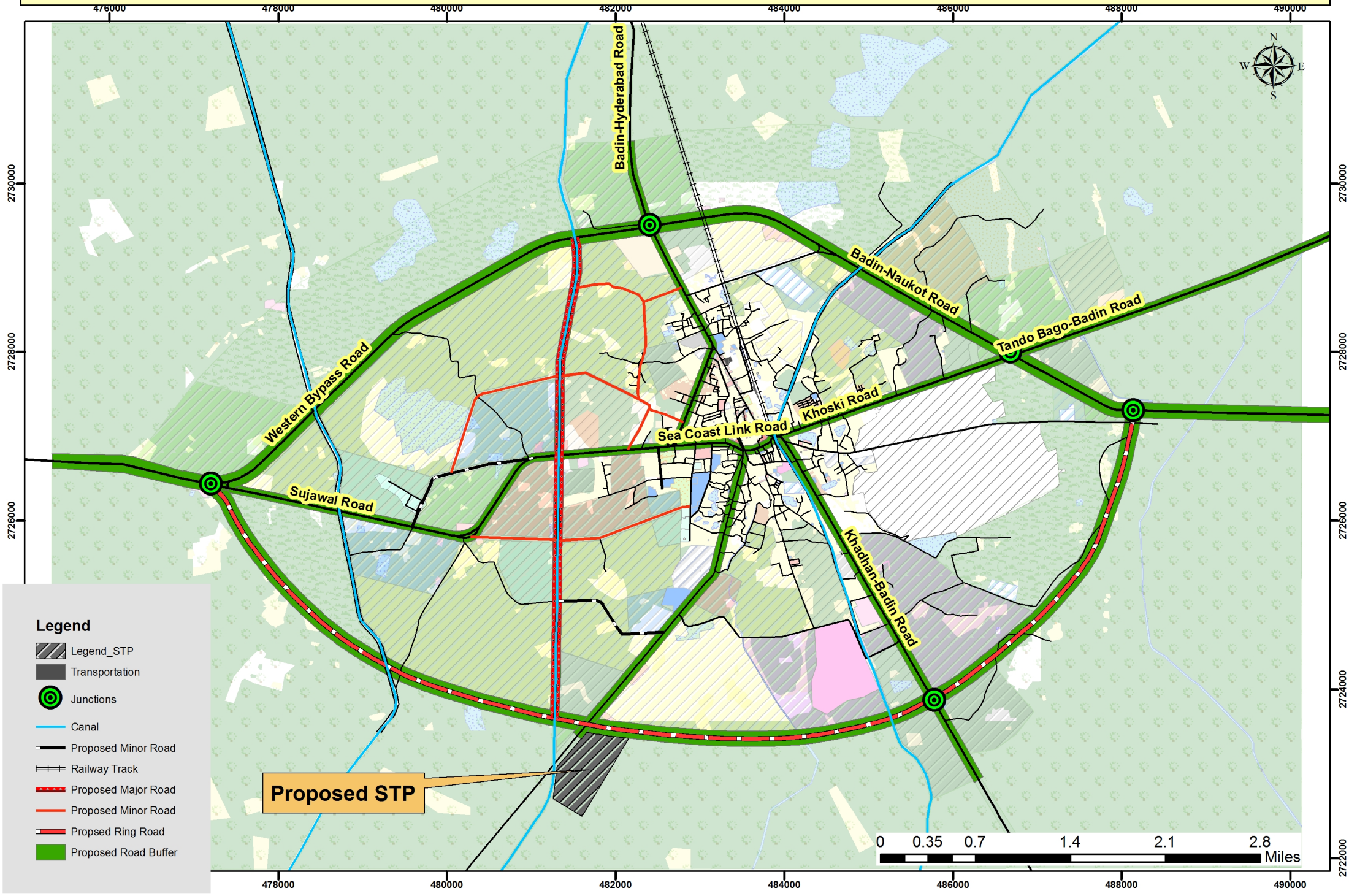
Proposed Religious & Graveyard Landuse for Badin Town



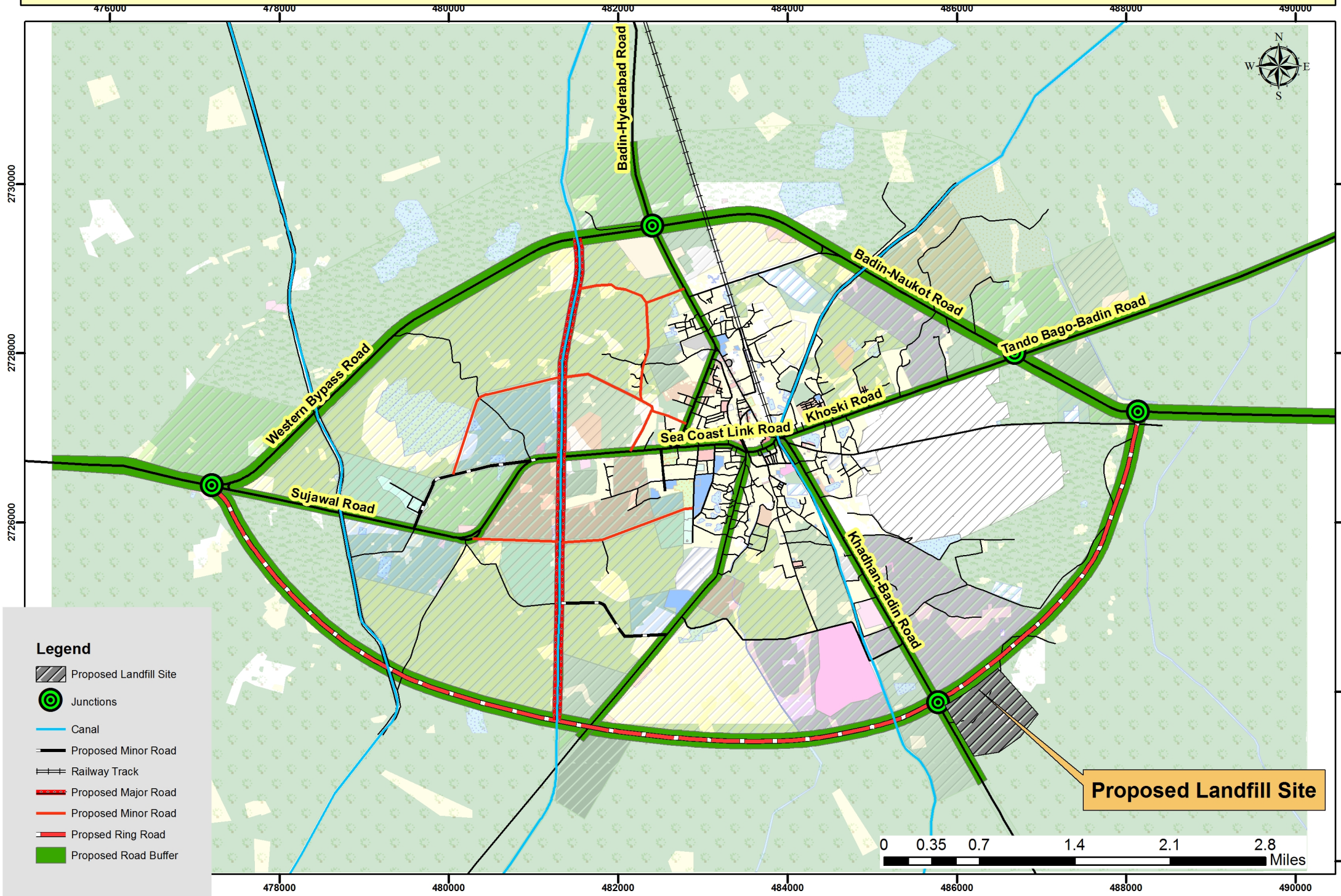
Proposed Utilities and Services Landuse for Badin Town



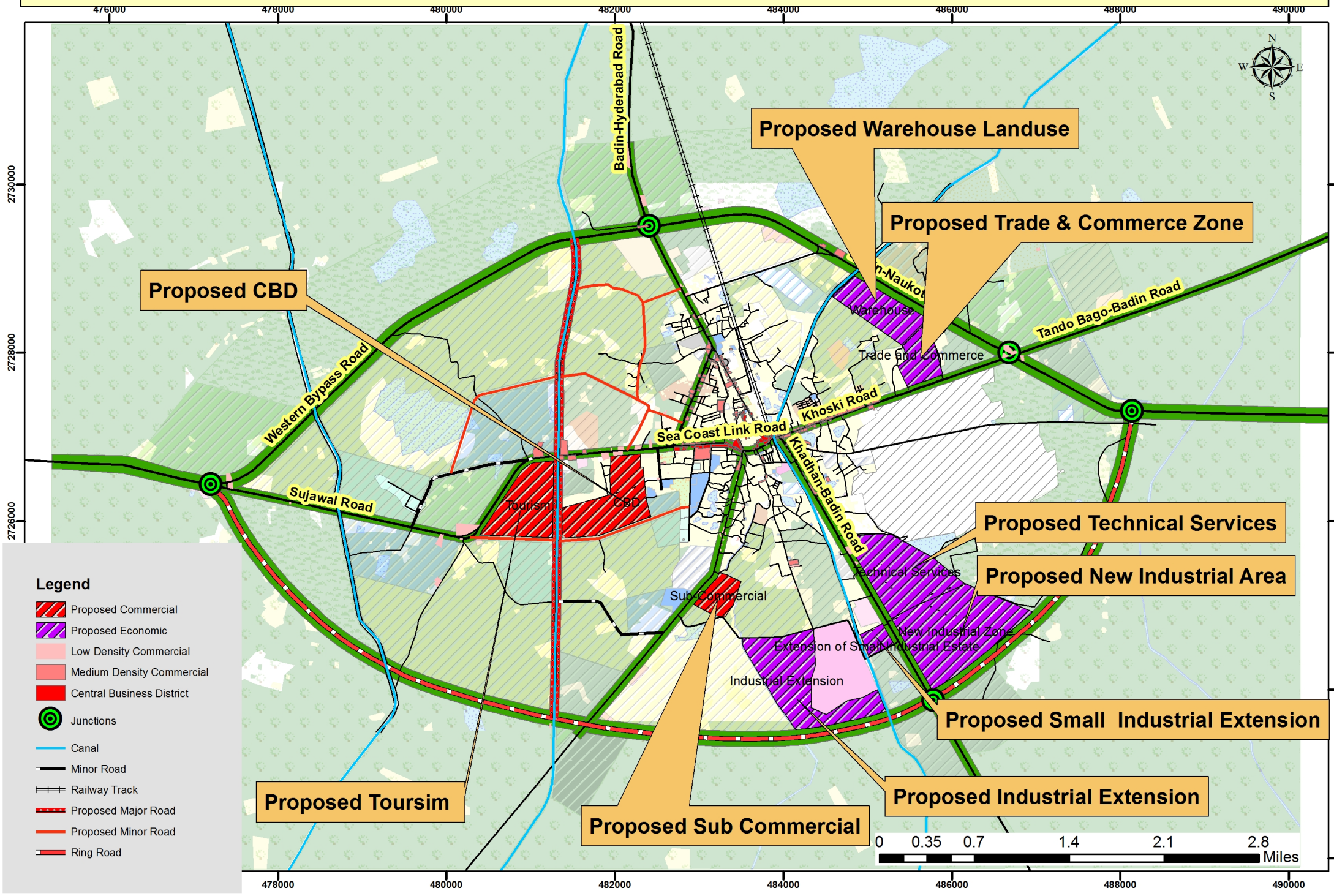
Proposed Utilities and Services Landuse for Badin Town



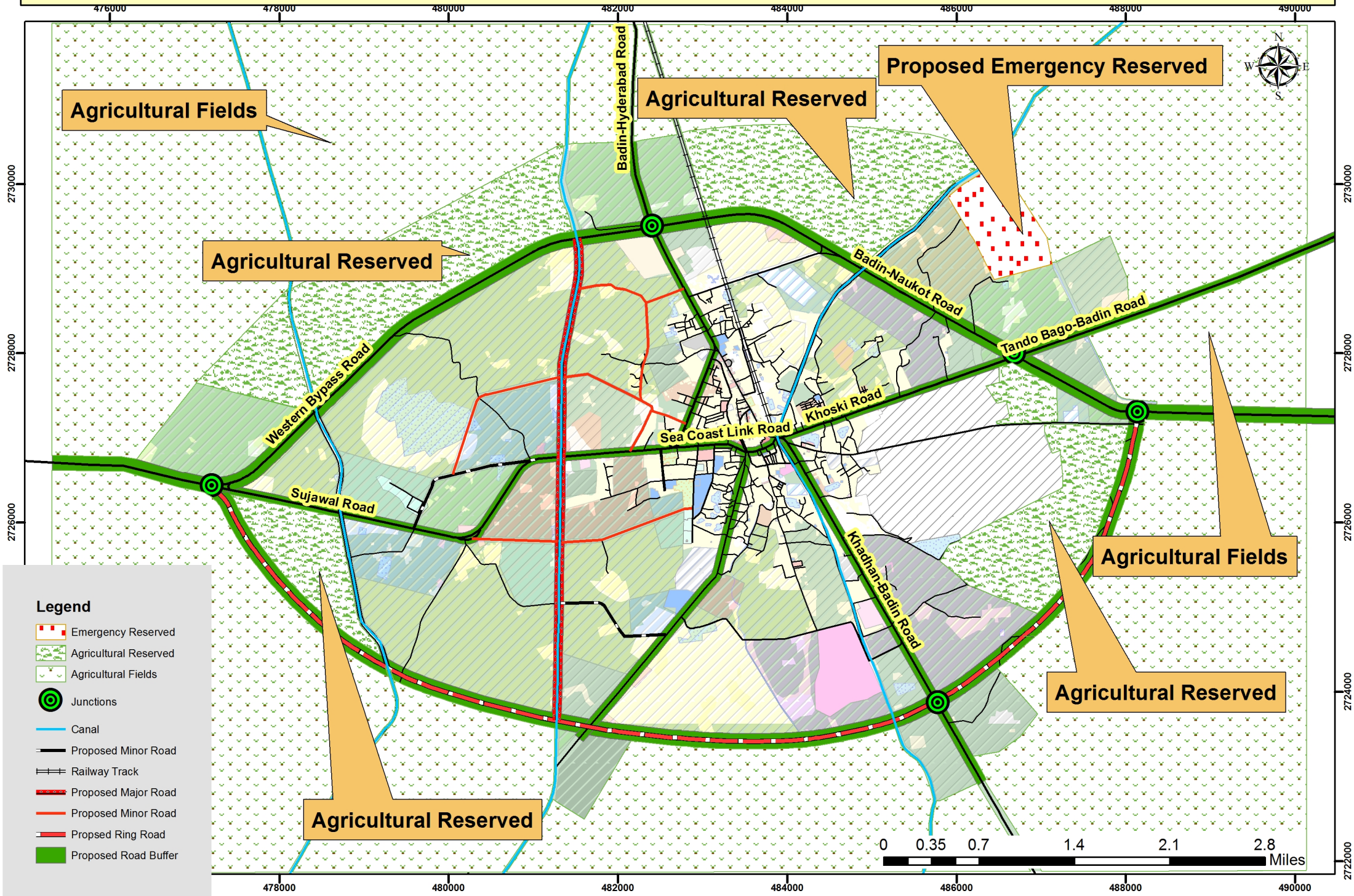
Proposed Utilities and Services Landuse for Badin Town



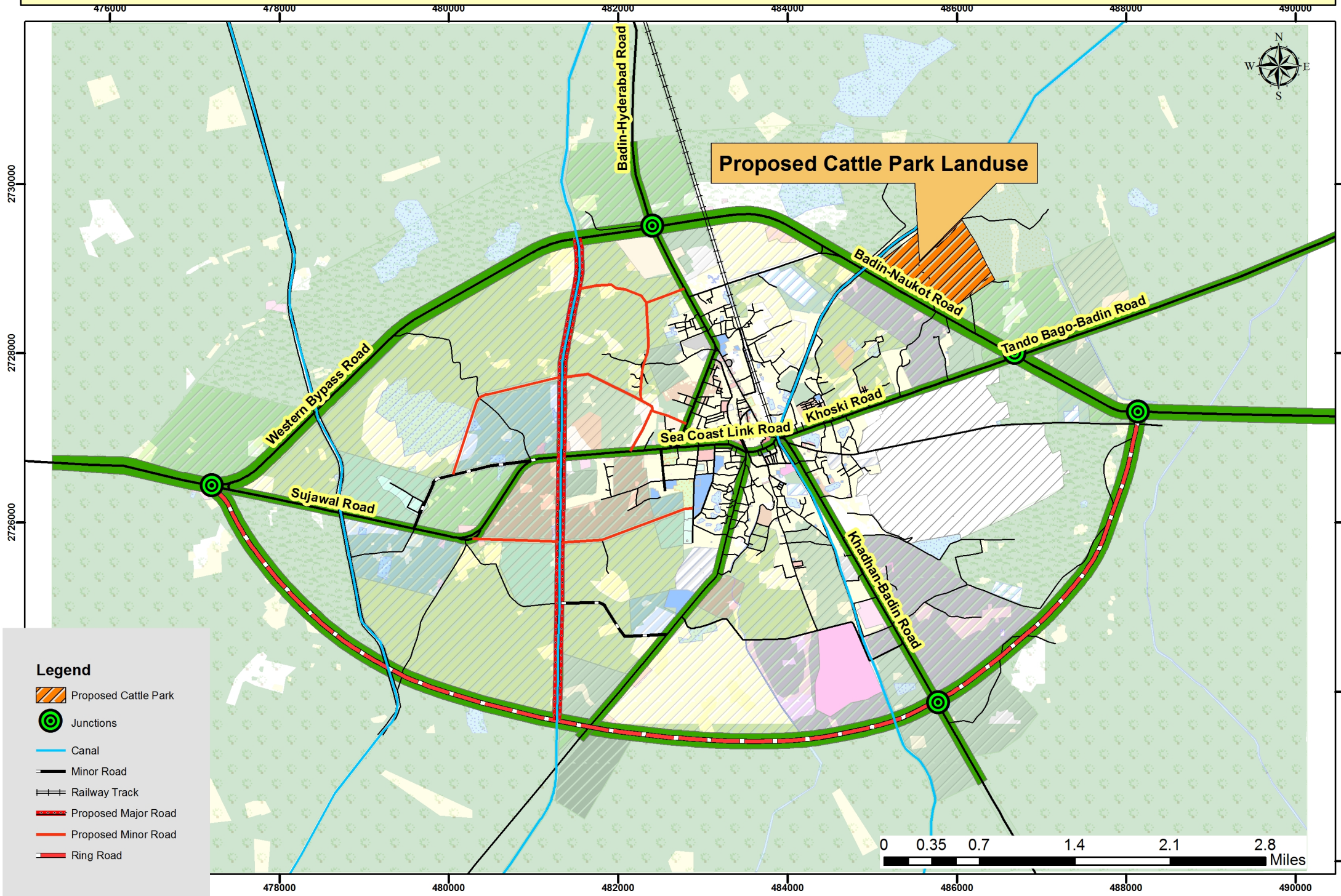
Proposed Economic Landuse for Badin Town



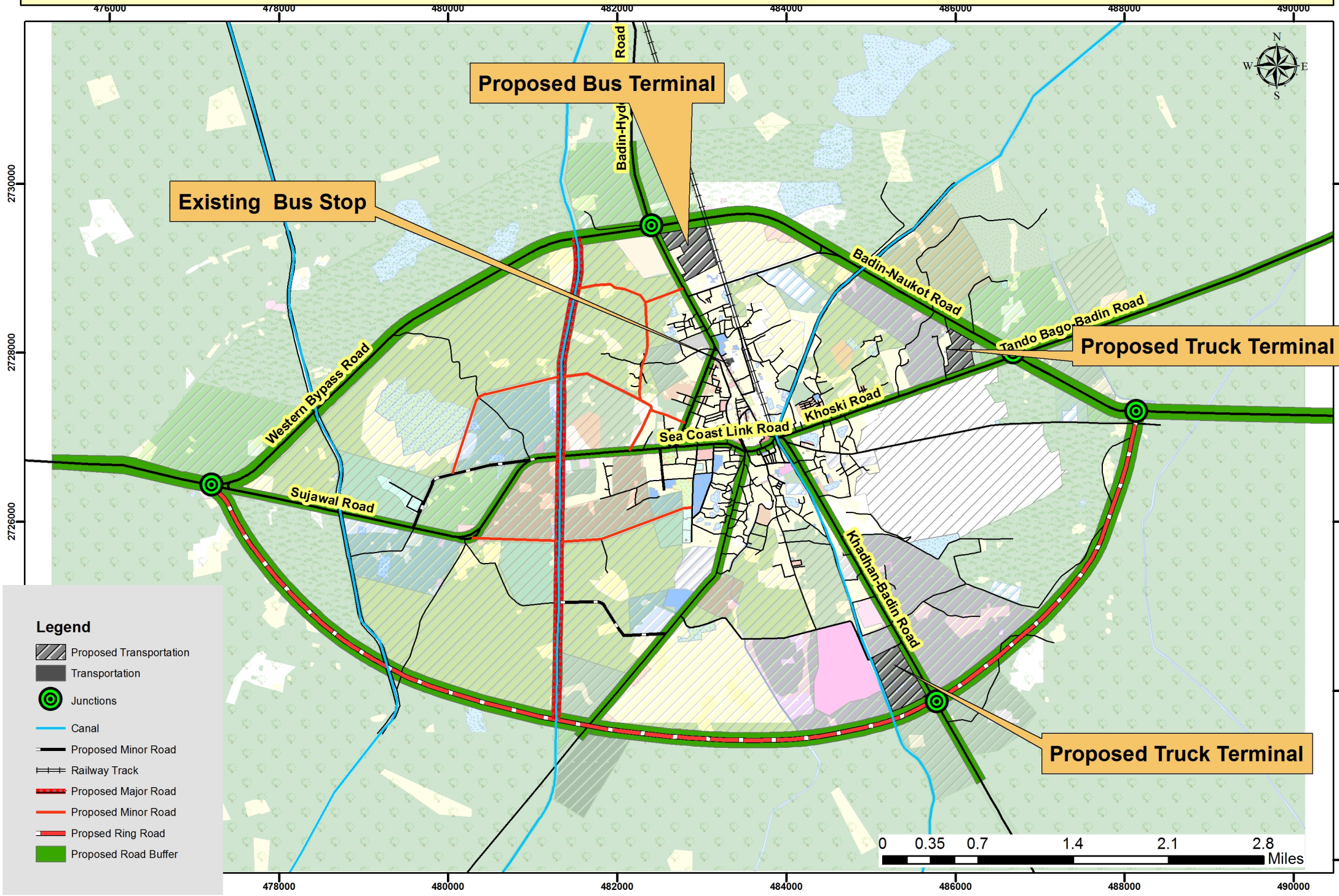
Proposed Agricultural Landuse for Badin Town



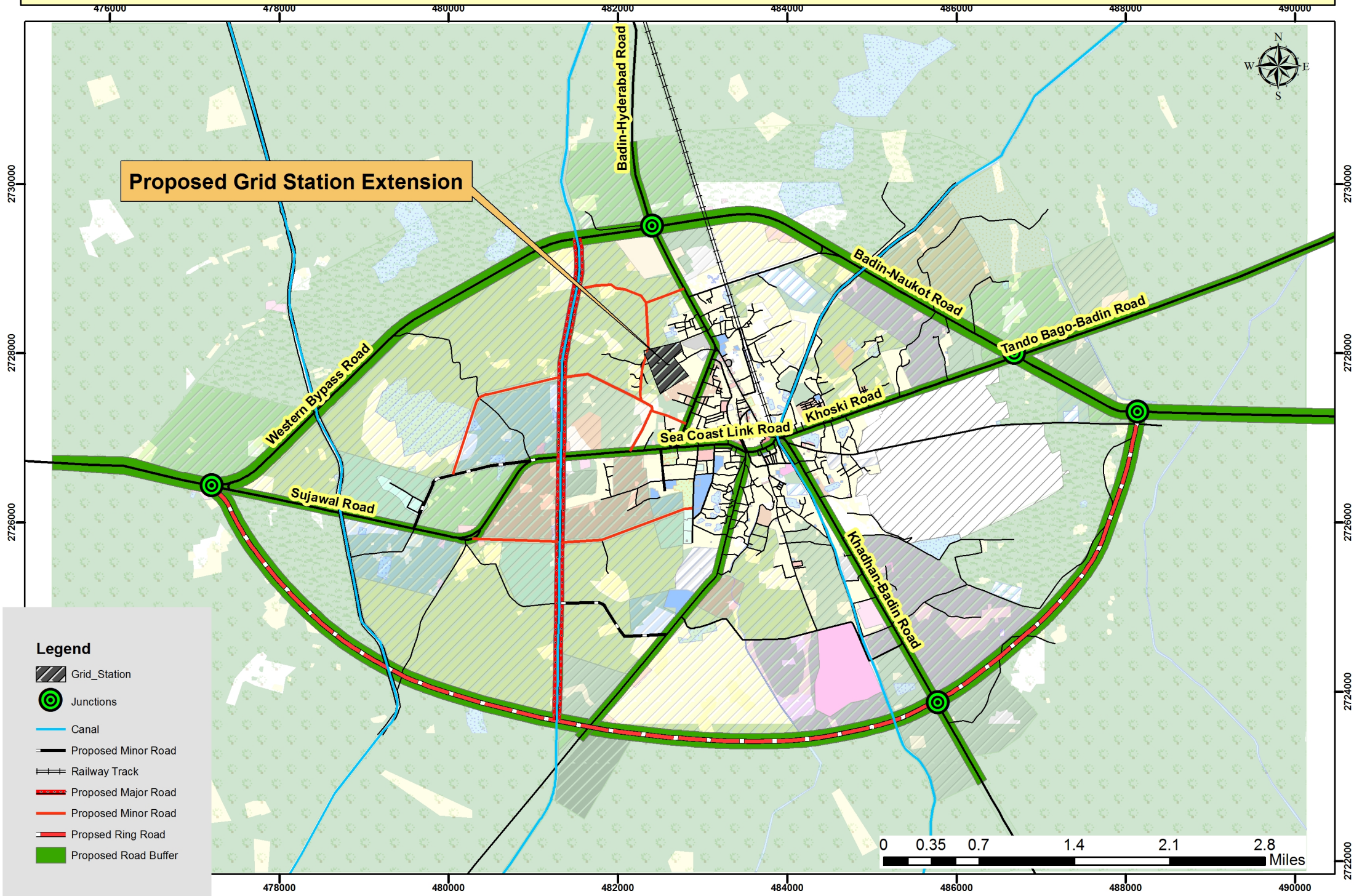
Proposed Livestock Landuse for Badin Town



Proposed Transportation Landuse for Badin Town



Proposed Utilities and Services Landuse for Badin Town



Proposed Administration Landuse for Badin Town

