REGIONAL DEVELOPMENT PLAN

SARGODHA DIVISION

Environment Sector

The Urban Unit

Urban Sector Planning & Management Services Unit (Pvt.) Ltd.

Environment Sector

Sargodha Regional Development Plan

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1.1. DEFINING A REGION

There is multifaceted way to express the terminology “Region” depending upon the scale of analysis. It could be any land that has common natural and artificial features.[1] It could also be any basic administrative unit that either encompasses an area, division, or district for local government.[2] More distinctively, it could be any administrative or politically/economically/spatially defined area which may cover different states/countries or could be at national / sub-national / local scale and has role in certain level of development.[3]

The administrative jurisdictions of Pakistan’s have four provinces which are further divided into divisions, districts, and subdistricts (tehsils, or tahsils).[4] Punjab is the country's most vibrant and populous province.[5] Geographically, it is situated over an area of 205345 sq km, consisting of:[6]

- Total Divisions = 09
- Total Districts = 36
- Total Tehsils = 145
- Total cities = 194

Figure 1: Divisions of Punjab Province

Considering differences in demographic, administrative and topographic characteristics, Punjab province is divided in to North, Central and South Punjab. The central Punjab includes Faisalabad, Rawalpindi, Gujranwala, **Sargodha**, Multan, Sialkot, Bahawalpur, Gujrat, Sheikhupura, Jhelum and Sahiwal.

These administrative units serve as the baseline for public spending from various tiers of government. As we move up the administrative hierarchy from cities and districts, division plays a crucial role in providing public services more efficiently due to economies of scales and higher decision-making power.

[1] https://www.nationalgeographic.org/encyclopedia/region/
[2] https://www.merriam-webster.com/dictionary/region
[3] Schmitt-Egner, P. 2010. The Concept of 'Region': Theoretical and Methodological Notes on its Reconstruction. *Journal of European Integration*. 24(3): 179-200.
[4] https://www.politicpk.com/punjab-province-list-tehsils-districts-divisions-%D8%B5%D9%88%D8%A8%DB%81-%D9%BE%D9%86%D8%AC%D8%A7%D8%A8/
[5] Hussain ST, Khan U, Malik KZ, Faheem A. 2012. The constraints to industry in Punjab, Pakistan. Lahore J. Econ. 17: 135–189.
[6] Provincial Census Report, 2017

Punjab Spatial Strategy 2047 outlines division as a good region for achieving larger development goals in harmony with districts and cities as well as for assessing the comparative advantages at a macro scale. **The strategy identifies division as a 'region' which form the economic units based on a regional vision and development plans which not only enhance competitiveness and productivity of the region but also enable efficient resource allocation and more economic returns.** In international context, China has successfully achieved its economic transition from an agrarian economy to an industrialized economy by focusing regional developments and integrated planning frameworks.

Considering the existing organizational structure of Punjab, **the term division will be used as an economic 'Region'** so that adoption of the plan requires minimal changes to existing processes on which current planning and systems have evolved. Sargodha is one of the economic hubs of Punjab and has high potential for economic growth and provides higher opportunities for private sector investments. Therefore, Sargodha Region (division) is chosen for the Regional Development Plan of Punjab.

1.2. SETTING THE CONTEXT

Cities are where development challenges and solutions meet. Regional plan plays an integral role when cities development activities influence at a regional scale which might end up in under-utilization and wastage of resources. Thus, demanding a regional level development plan which help to cater the spatial, economic and environmentally sustainable development in the region. It also helps in managing the challenges, disparities and competition for development resources between cities in a region as well as keep the goods and resources available to them as per their needs.

Green economy and environmental sustainability are integral components of Sustainable Development in the region as they both impact various dimensions of development interventions, starting from improving basic infrastructure and provision of clean, safe water and sanitation to fostering urban green spaces, good quality environment and harnessing natural habitat and biodiversity of cities. The integration of these dimensions is indispensable towards economic growth at local, regional and national scale.

For a region of well-connected multiple opportunities are offered to the urban *residents for recreation and social contact, good quality air and water, increase mobility and connectivity, vigorous mental and physical exercise places,* stress recovery, as well as more resilient to extreme environmental events, such as heat waves. Such a region (or a city) is also likely to have healthier inhabitants, decreasing demands on health services and contributing to a robust economy.

In Punjab, rapid growth of urbanization, industrialization and environmental pollution (along with other factors) has lessened the vital role of the natural environment and their associated values covering a wide range of ecosystem services to the citizens. According to Economic Survey of Pakistan 2013-14, the environmental degradation cost over Rs.365 billion to Pakistan's Economy in the past, including Rs.70 billion loss due to soil degradation, Rs.67 billion loss due to indoor pollution, Rs.65 billion loss because of air pollution, Rs.45 billion for lead exposures as well as land degradation and Rs.6 billion for the deforestation. This environmental degradation cost may cross Rs.450 billion. In the latest report of World

Bank (2019), the estimated cost of air, water, industrial pollution & occupational safety of Pakistan is almost 25 US$, billion or 8.9% of GDP[7].

Central Punjab is considered as the nucleus of Punjab's economic growth and social well-being therefore in grip of severe environmental crises as well. Sargodha Division (Region) is also facing issues which includes natural (e.g., maximum variations in temperature; dust storms) and anthropogenic sources (e.g., Industries, deforestation, urbanization etc.). major challenges faced by Sargodha Region includes lack of planned growth and industrial pollution (air and water) are at the top. Thus, demanding a number of interventions with a range of amenity green structures and improved environmental quality in order to develop a proportion between grey and green areas of the region.

Therefore, a regional development plan of environment sector is required which cater the needs of all districts of the Sargodha Region for sustainable economic development and socio-economic wellbeing of the citizens of this Region.

1.3. REGIONAL PROFILE

1.3.1. INTRODUCTION

Geographically, the Sargodha division lies form 32°09'60.00" North latitudes and 72°29'59.99" East longitudes covering total area of about 26,360 km^2.[8] According to Pakistan Population and Housing Census 2017, the division has a population of about 8.2 million.[9] Sargodha district usually comprises of flat, fertile plains, however important mountainous region are present in district Mianwali and district Khushab which are protected sites for wildlife biodiversity. The averaged elevation of the Sargodha division is about 155 m above sea level. On its Western & Northern sides, River Jhelum flows whereas lies on the eastern side the River Chenab flows[10].

Sargodha District admiratively comprises of 07 Tehsils namely Sargodha, Sahiwal,Kot Momin, Bhera Bhalwal, Shahpur, and Sillanwali[11]. It has 01 metropolitan corporation, 02 municipal committees, 10 town committees and 01 cantonment contributing 24.1% of total population of the district. 832 villages present in the Sargodha district.[12] The region is governed by the Commissioner while districts are governed by Deputy Commissioners (DCs).

Sargodha city is the administrative headquarter or capital city of Sargodha District and is located 94 km from Faisalabad to its southeast, 172km of Lahore to its northwest and 232 km from Dera Ismail Khan to its southwest. The city lies 30 miles from M-2 Motorway and connected to it from various locations through different interchanges.[13],[14]

[7] Opportunities for a Clean and Green Pakistan: A Country Environmental Analysis, World Bank 2019.
[8] EIA of Bhalwal Industrial Estate Sargodha. 2012.
[9] Pakistan Population and Housing Census, 2017.
[10] Ibid
[11] https://dposgd.punjabpolice.gov.pk/district_overview
[12] Development of Bhalawal Industrial Estate Sargodha. Environmental Impact Assessment Report, 2018. Punjab Industrial Estate Development and Management Company.
[13] https://www.punjab.gov.pk/districts
[14] http://www.pakinformation.com/punjab/divisions.html

1.3.2. DEMOGRAPHIC TREND

There is a substantial urban-rural population size differences within the Sargodha Region. According to 2017, Census of Pakistan, the annual growth rate of Sargodha Region is 1.94. Moreover, the district level analysis shows that the ratio of Urban and Rural population is 28.13% and 71.87% respectively for Sargodha Region. The detailed demographic profile of Sargodha Region is given below:

Table 2: Demographic Profile of Sargodha Region[15,16]

Sargodha Region					
Sr. #	**Particulars**	**Sargodha District**	**Khushab District**	**Mianwali District**	**Bhakkar District**
1.	**Location**	32.1566° N, 72.8043° E	32.3259° N, 72.1416° E	32.6645° N, 71.4774° E	31.6082° N, 71.0854° E
2.	**Area (km^2)**	5,854	6,511	5,840	8,153
3.	**Population (2017)**	3,903,588	1,281,299	1,546,094	1,650,518
4.	**Population Density** (per Sq. Km)	455.4	139.1	180.9	129
5.	**Urban Proportion**	28.13	25.28%	20.82	16.04
6.	**No. of Tehsils**	07 (Sargodha, Kot Momin, Bhalwal, Shahpur, Sillanwali, Sahiwal, Bhera)	04 (Khushab, Noorpur, Quaidabad, Nowshehra)	04 (Mianwali, Isa Khel, Bhakkar, and Layyah)	04 (Bhakkar, Darya Khan, Kallurkot, Mankera)
7.	**Average Household Size**	6.5	6.2	7.1	6.6

By 2031, it is likely that the population of Sargodha Region will grow by 21.8%. District wise population projection is provided in the below table;

Table 3: Projected Population[17]

Districts	Growth Rate (1998-2017)	2017	2021	2025	2031
Sargodha Region	**1.94**	**8,181,499**	**8,835,099**	**9,540,913**	**10,706,751**
Sargodha District	1.74	3,703,588	3,968,164	4,251,640	4,715,274
Khushab District	1.84	1,281,299	1,378,237	1,482,510	1,653,895
Mianwali District	2.02	1,546,094	1,674,855	1,814,339	2,045,645
Bhakkar District	2.4	1,650,518	1,814,764	1,995,354	2,300,486

[15] https://www.pbs.gov.pk/sites/default/files//tables/District%20at%20a%20glance%20Sargodha.pdf
[16] DISTRICT_WISE_CENSUS_RESULTS_CENSUS_2017.pdf
[17] Based on the Statistical Analysis done by the Urban Unit

As the population grows over the next decade, the burden on the environment and natural resources of Sargodha region may become even greater. Thus, demanding a regional level development plan where development efforts are focused on the creation of system of cities which foster intercity networking, create more jobs and increase productivity as well.

1.3.3. CLIMATE RISKS AND ENVIRONMENTAL TRENDS

1.3.3.1. CLIMATE

The climate of the Sargodha is hot and dry during summers whereas moderate cold in the winters. The maximum temperature in the summer reaches up to 50^{0}C (122 °F) while the minimum lower temperature in winter can be recorded as low as freezing point. Summers usually start from April and ends till September wherein heat become intolerable. However, winter usually lasts from the end of October till the middle of March and is generally quite pleasant. Generally, the Sargodha division like other divisions of Punjab experiencing 04 distinct climatic variations. [18,19,20]

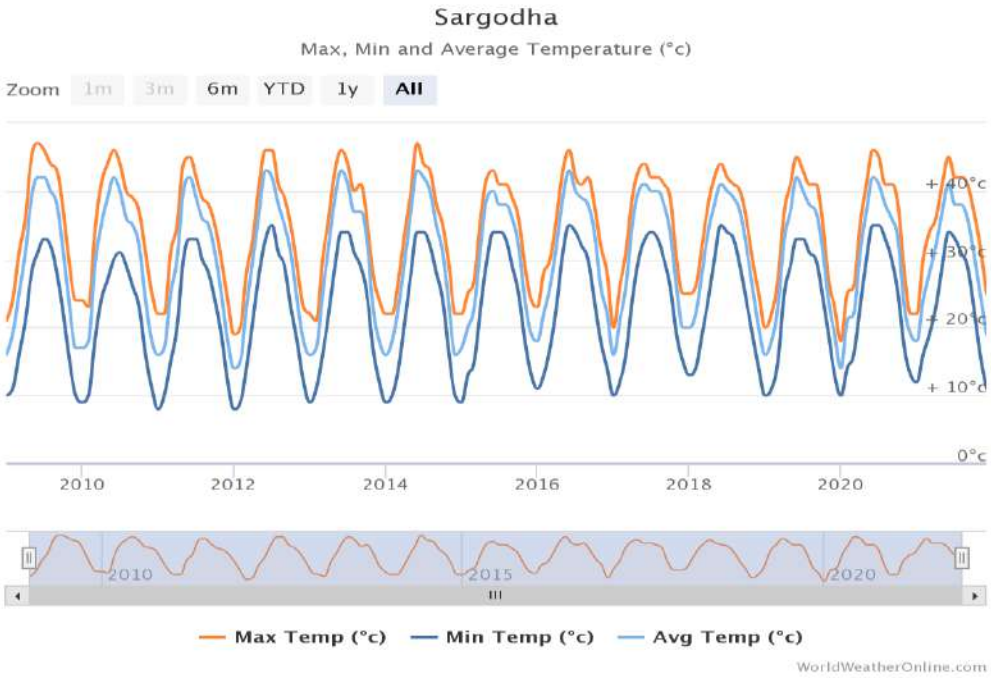

Figure 2: Ombothermal diagram of Sargodha District (over past 10 years)

[18] Mobeen, M., Ahmed, H., Ullah, F., Riaz, M.O., Mustafa, I., Khan, M.R. and Hanif, M.U. (2017), "Impact of climate change on the precipitation pattern of district Sargodha, Pakistan", *International Journal of Climate Change Strategies and Management*, **9**(1), 21-35. https://doi.org/10.1108/IJCCSM-10-2015-0147

[19] Saqib, F. and Gill, M. I. 2019. A Historical Analysis of Temperature and Rainfall Patterns of Punjab, Pakistan. *Pakistan Geographical Review*, 74(2): 74-89

[20] Anwar, S., Syed, N. A., Samin, D., Ahmad, M. N. and Ahmad, S. R. 2020. Study of Climate Variability of Sargodha, Pakistan using Satellite Derived Temporal Land Surface Temperature and its comparison with Ground Data. *International Journal of Current Research.* **12**(07): 12501-12505. DOI: https://doi.org/10.24941/ijcr.38776.07.2020.

- First is Hot and dry weather (April-June) where precipitation is very low and temperature may reach up to 110°F
- Second is Humid monsoon season (July to September) where the district receives maximum precipitation.
- Third is dry-cool weather (October to November) whereas;
- Fourth one is cold-foggy weather (December to March) when temperature can fall as low as 40°F and the district receives light rain due to western disturbances.

As per the 5th Assessment Report of the Intergovernmental Panel on Climate Change, the climate change risks are concentrated in urban areas of Punjab. Heat stress/Urban Heat Island (UHI), extreme precipitation, inland flooding, landslides, air pollution, drought, and water scarcity are some of them. The Climate Change Profile of Pakistan provides ranking of districts based on climate risks and hazards classification as exhibited in Table 3.[21]

Table 4: District Level Climate Risk and Hazard Assessment Classification[22]

Rank	District	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk
80	Sargodha	4	2	3	-	2	2	1	1
84	Khushab	4	2	3	-	2	2	1	1
59	Mianwali	4	4	3	-	2	2	1	1
130	Bhakkar	3	1	2	-	1	1	1	1
Scoring Key									
		Very High	High	Medium	Low	Very Low	Non-Hazard		
		5	4	3	2	1	-		

The above table shows that the flood risk is much higher in Sargodha Region as compared to other environmental disaster such as Landslides, Earthquake, cyclones etc. The Region is particularly affected by heavy flooding in the past and are at a high risk of Floods. Earthquakes in Sargodha Region usually are not frequent, however, occasionally shocks having less intensity are felt. Furthermore, dust storms/ wind storms in Sargodha Region are not uncommon. Throughout the year strong wind continues to blow which carrying away sand particles and dust clouds. However, an unusual and destructive dust storms is not recorded yet.[23]

1.3.3.2. RAINFALL AND HUMIDITY

Sargodha region relatively experiencing 250mm-759mm of average rainfall annually.[24] The highest precipitation months are July and August, when the monsoon reaches Punjab. September to December

[21] Chaudhry, Q. 2017. *Climate Change Profile of Pakistan*. Asian Development Bank, Philippines. doi.org/10.22617/TCS178761
[22] Chaudhry, Q. 2017. *Climate Change Profile of Pakistan*. Asian Development Bank, Philippines. doi.org/10.22617/TCS178761
[23] Development of Bhalawal Industrial Estate Sargodha. Environmental Impact Assessment Report, 2018. Punjab Industrial Estate Development and Management Company.
[24] Environmental Impact Assessment (EIA) Report of Rehabilitation of SW Sugar Mills Limited, Sillanwali Farooqa Road, District Sargodha Pujnab. Pakistan. Environmental Consultancies & Options (ECO).

are relatively dry months in which average rainfall is very low. However, January to May are the driest months with low precipitation. It is estimated that Sargodha typically gets about 0.86 inches (21.87 millimeters) of precipitation yearly and have about 46.78 rainy days (12.82% of the time) annually.[25]

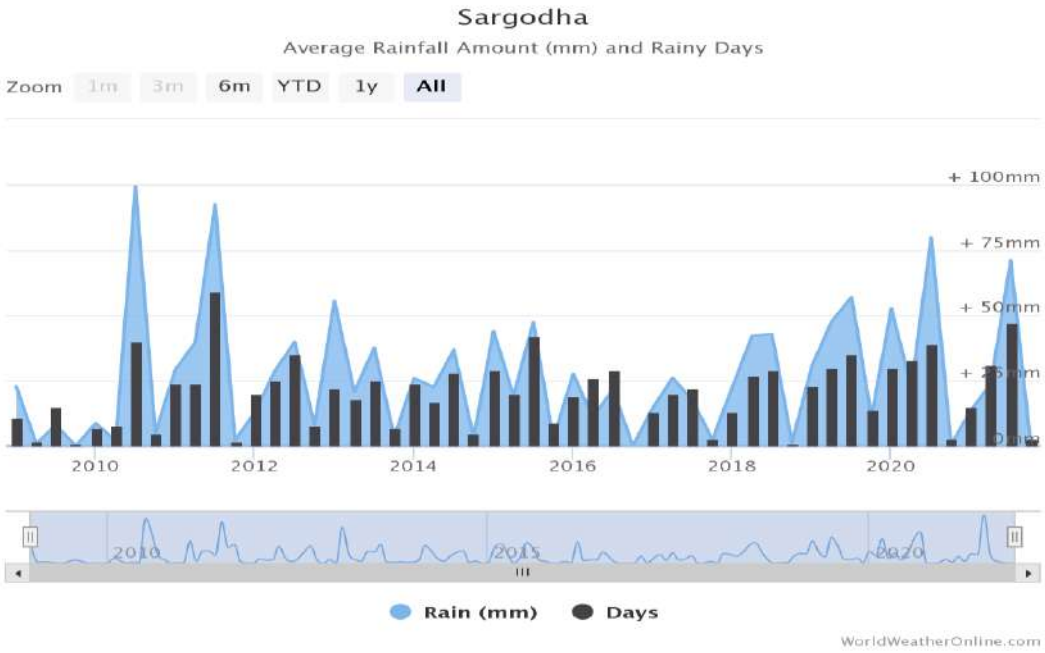

Figure 3: Historic Rainfall Pattern of Sargodha (2010 - 2020)

1.3.3.3. ENVIRONMENTAL QUALITY

The Environmental Quality of Sargodha Region are as follows;

- **Air Quality**

Air quality Index of Sargodha Region is moderate to unhealthy. Potential contributing factors are industrial emissions, road transport, brick kilns and household activities.

Air quality index
Moderate to Unhealthy

Major industries present in and around Sargodha region includes:

- Soda Ash, Sugar industries, Brick kilns & Mines – **Sargodha District**
- Cement and Chip Board Industry, Brick kilns – **Bhakkar District**
- Cement, Fertilizer, Sugar & Brick kilns Industry – **Mianwali District**
- Cement, Textile, Soda Ash, Mining, Gypsum, Brick kilns & Salt industry – **Khushab District**

Moreover, the average concentration of $PM_{2.5}$ in Sargodha Region is also high as compared with PEQs concentration of PM 2.5 i.e., 35ug/m^3. All 04 districts fall in extremely polluted to highly polluted cities

[25] https://tcktcktck.org/pakistan/punjab/sargodha/august-2014

with **Sargodha** on top having average conc. is 114 ug/m^3, following by **Bhakkar** 89 ug/m^3, **Khushab** 85 ug/m^3 and **Mianwali** 70 ug/m^3 [26].

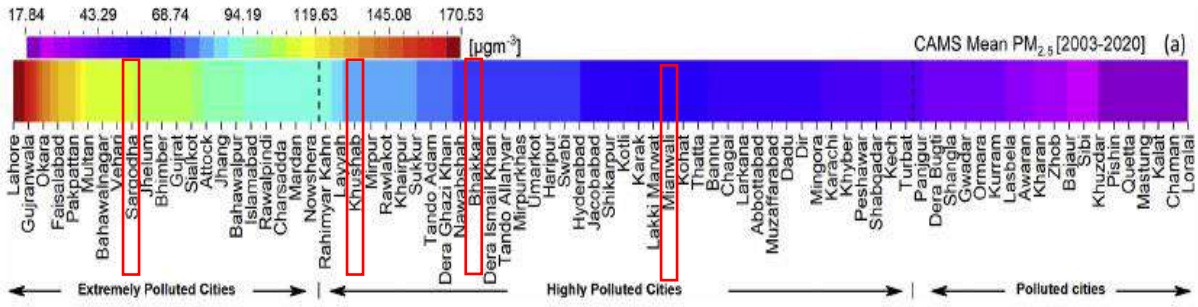

Figure 4: Mean $PM_{2.5}$ Concentration (2003-2020) in Bahawalpur Region and Overall Punjab

Moreover, the Aerosol Index and Carbon monoxide of Sargodha Division was also assessed through satellite imagery (sentinel P5) which shows that:

- **Aerosol Index**: Higher in southern part possibly due to dust storms arising from Bhakkar district and then gradually decreasing in the centre and NE borders of Sargodha Region. Possible sources could be traffic flow, construction of buildings, desert dust, burning and industrial activities.
- **Carbon Monoxide Hotspots**: Higher throughout the region particularly in Northeast borders of Sargodha district. Major sources could be Vehicle emission, fire smoke and gasoline equipment.

Water Quality

Rapid urbanization in Sargodha region degrading its groundwater quality. Secondary sources[27,28,29] revealed that hydrogeological and geochemical studies of groundwater of Sargodha city was conducted. The data showed that the groundwater of Sargodha city, where there is more urbanization, is not suitable for drinking purposes as its values for EC, Magnesium, TDS, Chlorine, Sulfates and other parameters. is higher than acceptable limits of PEQs/ NEQs. However, this water is considered as fit for irrigation and industrial purposes. Moreover, the water samples taken from sparsely build up area of Sargodha city were analyzed and observed as fit for drinking purposes.

Noise Quality

Limited data is available on Noise Quality of in 04 disitricts of Sargodha division. Secondary sources reported higher noise level at busiest places of Sargodha region like General Bus Stand, Farid Gate, industrial area.

[26] Bilal et al.,2021, Air pollution scenario over Pakistan: Characterization and ranking of extremely polluted cities using long-term concentrations of aerosols and trace gases,Remote Sensing of Environment, 264, 112517.
[27] Mobeen, M., Moin, A., Rehman, S. and Ullah, M. F. 2018. Assessing groundwater quality with special reference to the human, agricultural and industrial use in Sargodha Punjab, Pakistan. *Journal of Biodiversity and Environmental Sciences.* **13**(5): 26-56.
[28] Faisal, R., Naseem, A., Tahir, A., Tariq, C., Omar, R., Taswar, A., Ullah, F. M. and Saif. R. 2019. Groundwater Quality of Sargodha City and its Suitability for Domestic and Irrigation Purpose. *Fresenius Environmental Bulletin*. **28**. 7695-7700.
[29] Mobeen, M., Moin, A. and Naseer, M. 2017. Ground water aquifer properties of Sargodha City, Punjab, Pakistan. *Journal of Biodiversity and Environmental Sciences.* **11**(5): 138-148.

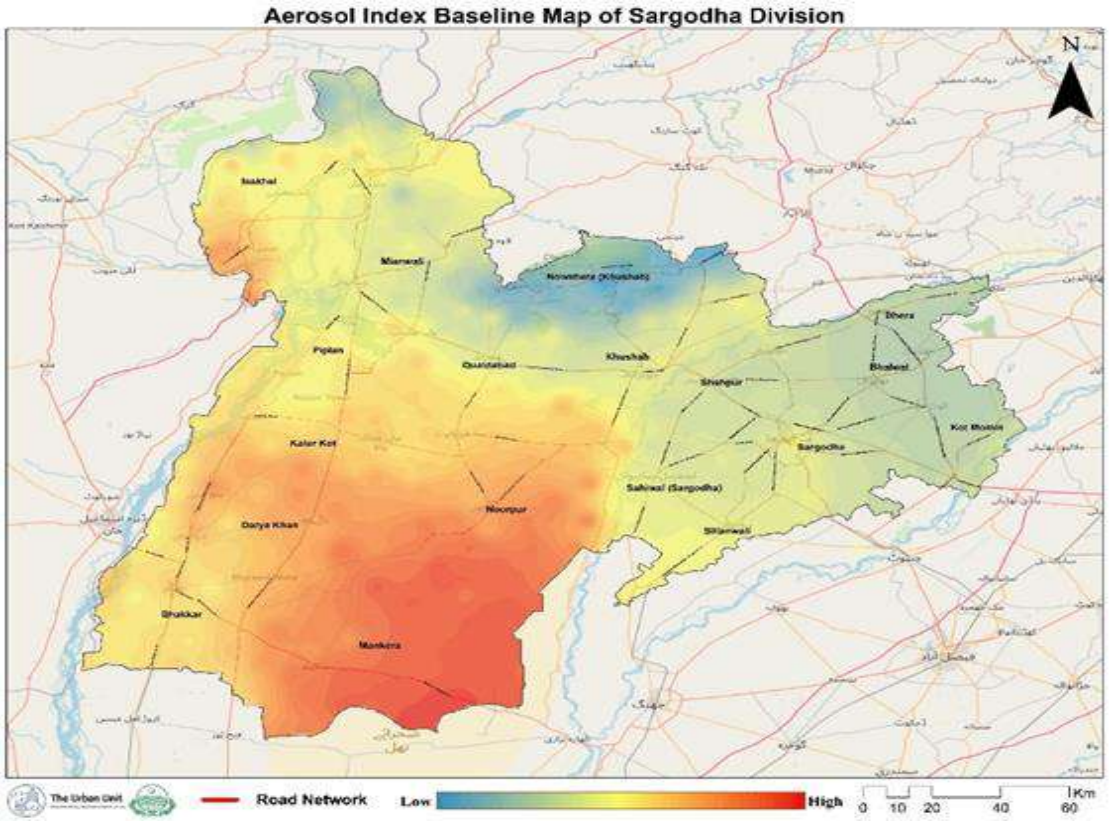

Figure 5: Aerosol Index Map of Sargodha Division

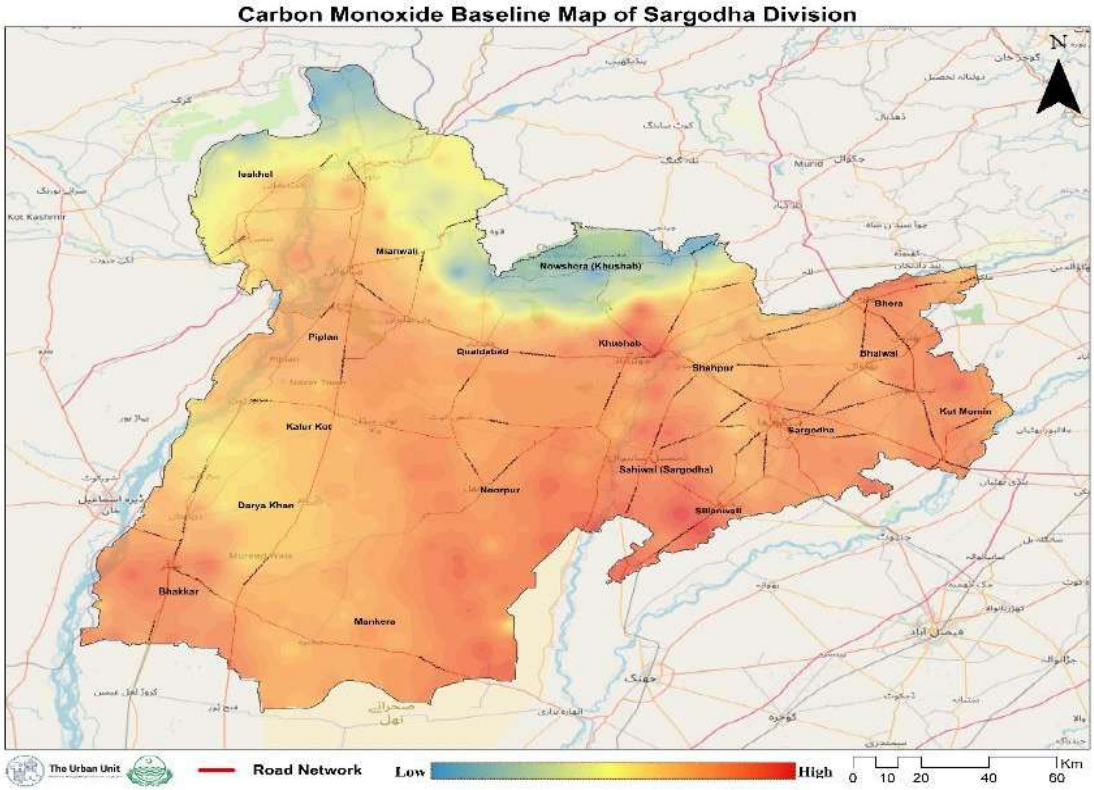

Figure 6: Carbon Monoxide Map of Sargodha Division

1.3.4. PROTECTED AREAS AND BIODIVERSITY

Sargodha Region has a unique set of biodiversity and providing a number of ecosystem services. Details are as follows;

1.3.4.1. PROTRECTED AREAS

- **Nabi Shah Game Reserve**

In Sargodha district, a game Reserve covering an area of about 1674 acres was established by Government of Punjab in Nabi Shah Lake. On February 09, 2009, this area is declared as Game Reserve for all wildlife species for a period of 05 years. This game reserve usually functional during monsoon season particularly in the month of September to January. Wide range of birds and other wildlife species visited and stayed at this place predominantly in the month of January.[30]

- **Chinji National Park**

On Sargodha Road, district Chakwal, a protected area having IUCN Category II is established in 1987 and named as Chinji National Park. It is located near Salt Range about 130 km from Islamabad wherein covering an area of about 6,095 hectares (15,061 acres).

Currently, Punjab Forest Department planned to establish a new park in Chinji National Park in which modern facilities such as modern museum, parks, 25-kilometre-long track for Jeep Racing and boating facility is ensured.[31]

- **Chumbi Surla Wildlife Sanctuary**

In Khushab district, a Wildlife Sanctuary named as Chumbi Surla Wildlife Sanctuary is present which is spreading over an area of about 138,840 acres in which 15,000 acres are of State Forest. This wildlife Sanctuary was established in 1978 and is considered as one of the Strongholds for conserving the threatened Punjab Urail (*Ovis vignei punjabiensis*) Population.[32]

- **Harnoli Wildlife Sanctuary**

In Mianwali district, a Wildlife Sanctuary named as Harnoli Plantation is present covering an area of about 2,196 acres. This was established particularly for the conservation of *Dalbergia sissoo* (Shisham), *Eucalyptus sp*. (Sufaida) species.[33]

[30] Development of Bhalawal Industrial Estate Sargodha. Environmental Impact Assessment Report, 2018. Punjab Industrial Estate Development and Management Company.

[31] https://tribune.com.pk/story/2261153/govt-plans-recreational-area-at-chinji-national-park

[32] Chaudhry, A. A., Hameed, M., Riaz, A. and Hussain, Anwar. (2001). Phyto-Sociologocal Studies in Chhumbi Surla Wildlife Sanctuary, Chakwal, Pakistan. I. Species Diversity. *International Journal of Agriculture & Biol*ogy. **3**(4): 363-368.

[33] Saleem, J., Butt, A., Jabeen, A. D. and Naqvi, A. 2018. Comprehensive appraisal of protected areas of Pakistan; their management status and encumbrance. *Journal of Biology and Environmental Sciences*. **12**(2): 188-203.

- **Uchali & Khabeeki lake**

In district Khushab, the Uchali Wetland Complex is present which constitutes of Uchali, Khabeeki and Jhalar Lakes and are notified as Wetland of International Importance under the Ramsar Convention.

Moreover, the Government of Punjab has also notified Uchali lake, having an area of about 2329 acres, as Game reserve and Wildlife Sanctuary (*Wild Life Sanctuary since 1993/ Game Reserve since 1986 vide section 18 of Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974*) whereas Khabeki Lake, having an area of about 700 acres, was declared as Wildlife Sanctuary (*Wild Life Sanctuary since 1972vide section 16 of Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974*) in order to conserve the globally significant and unique biodiversity especially the globally threatened White-headed Duck (*Oxyura leucocephala*) and other endangered waterfowls and significant migratory birds.[34]

- **Mitha Tiwana Plantation**

In district Khushab, Mitha Tiwana Forest Reserve is present covering an area of about 1116 hectares. It was notified in 1970 fot the purpose to conserve floral species viz., *Propsopis Cineraria* (Jhad), *Acacia Farnesiana* (Babool) etc.[35]

- **Kalabagh Game Reserve**

The Kalabagh Game Reserve is established in early 1930s, in Mianwali District. It covers an area of about 1550 hectares. It was established to conserve Golden Jackal and threatened Urail species.[36]

- **Namal Lake**

In Mianwali District, a game reserve at Namal Lake having an area of about 1200 hectares was established in 1970 for the purpose to conserve endangered native species.[37]

- **Chashma Barrage & Kundian Plantation**

In Mianwali district, the wildlife Sanctuaries at Kundian Plantation, having an area of about 19,274 acres, and Chashma Lake, having an area of about 81,750 acres, were established. The Chashma Lake is the 2nd largest water reservoir after upstream Tarbela which is present on Indus.[38]

[34] http://archive.ramsar.org/pdf/wurc/Pakistan_Management-Plan_Uchali-Wetlands-Complex.pdf
[35] Ibid at 26
[36] Farisina, M. R., Awan, G. A. and Woodford, M. H. 2007. Determining Trophy Harvest Quota Through a Status Survey of Urial (Ovis orientalis) in the Kalabagh Game Reserve, Punjab Province, Pakistan. *Journal of the Bombay Natural History Society*. **104**(1): 35-39
[37] Ibid at 26
[38] https://www.dawn.com/news/942378/www.tupernic.com

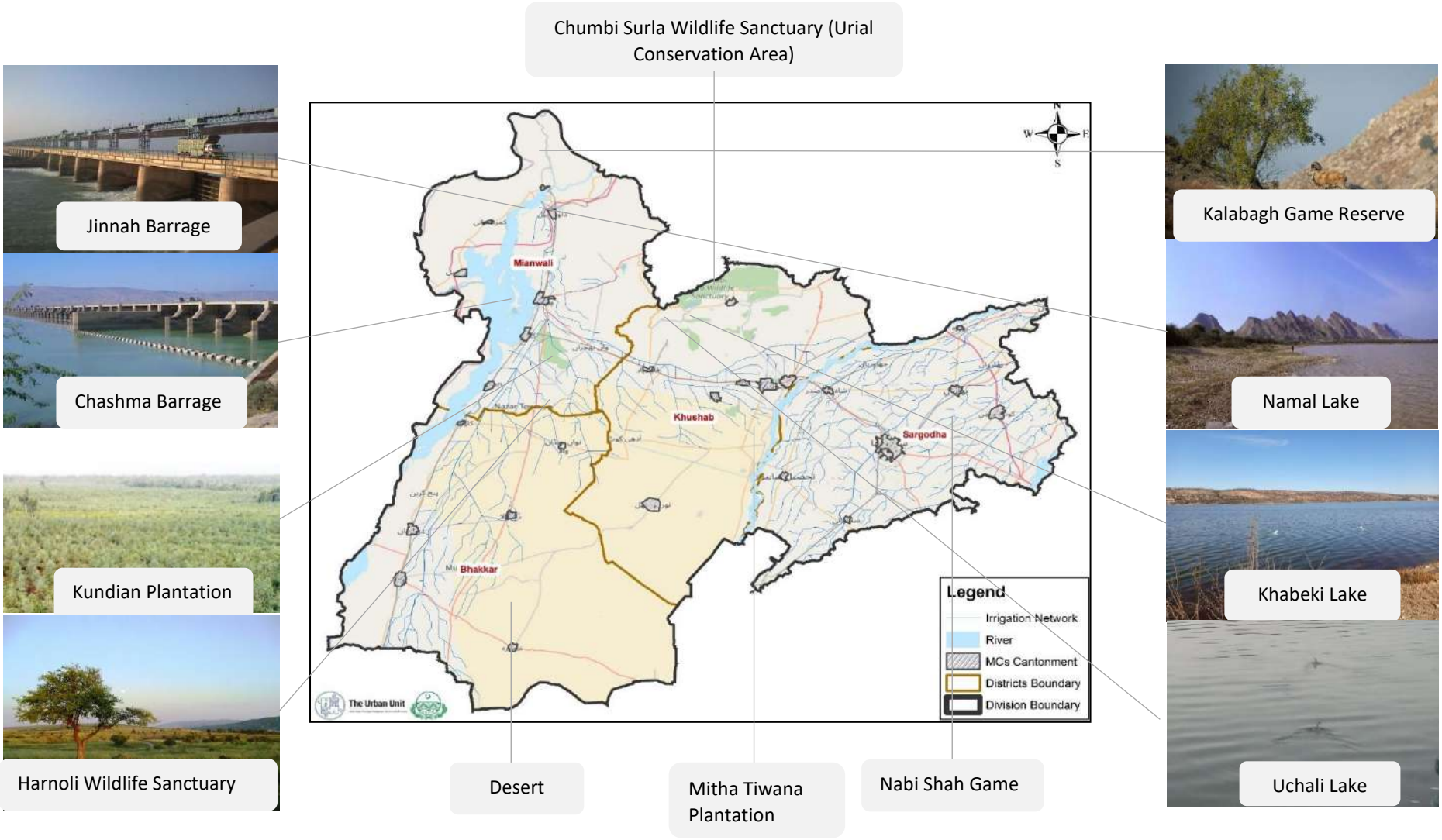

Figure 7: Map depicting Protected areas of Sargodha Division

1.3.4.2. FLORA

District Sargodha has a wide range of floral diversity. Generally, the vegetation cover of Sargodha district composed of dry deciduous scrub and Tropical thorn forest. The ethnobotanical data of Sargodha district revealed that there are 100 tree species (94 angiosperms, 6 gymnosperms) belonging to 77 genera (71 angiosperms, 6 gymnosperms) and 39 families (35 angiosperms, 4 gymnosperms) are found. Among them the most abundant species found are listed below:[39,40]

Table 4: Abundant Floral species of Sargodha Division

Sr. No.	Common Name	Scientific Name
Trees		
1.	Shisham	*Dalbergia sissoo*
2.	Kikar	*Acacia nilotica*
3.	Phulai	*Acaucs Moclerta*
4.	Simal	*Bombax ceiba*
5.	Siris	*Albizia lebbeck*
6.	Toot	*Morus Alba*
7.	Neem	*Azadirachta Indica*
8.	Jamman	*Eugenia Jambolana / Black Plum*
9.	Mesquet	*Prosopis juliflora*
10.	Peepal	*Ficus religiosa*
11.	Frash	*Tamarix articulate*
12.	Shetoot	*Morus alba*
13.	Ber	*Zizyphus jujube*
14.	Sohanjna	*Morings ptergosperma*
15.	Lasura	*Cordia myxe*
16.	Mulberry	*Morus alba*
17.	Khajji	*Phonenix dactylifera*
18.	Jand	Prosopis cineraria
19.	Bakain	*Melia azadrichta*
20.	Bamboo	*Bombox ceiba*
Shrubs		
21.	Van	*Selvadora abeoides*
22.	Kari	*Salsola fostids*
23.	Jand	*prosopis spicigera*

[39] Environmental Impact Assessment (EIA) Report of Rehabilitation of SW Sugar Mills Limited, Sillanwali Farooqa Road, District Sargodha Pujnab. Pakistan. Environmental Consultancies & Options (ECO).

[40] A, Shah., Rahim, S., Bhatti, K.H., Khan, A., Din, N., Imran, M., Mohsin, M., Ishtiaq, M., Nabila, A., Ansari, A., Hussain, S., Zafar, M., Mushtaq, M., Mumtaz, E. and Iqbal, J. 2015. Ethnobotanical study and conservation status of trees in the district Sargodha, Punjab, Pakistan. *International Journal of Experimental Botany*. **84**: 34-44

24.	Malla	*Zizypluys nummularia*
25.	Jal	*Salvadora obeoides*
26.	Succulent plant	*Euphorbia caducifolia*
Grasses		
27.	Sarkenda	*Sachrum spp*
28.	Lawn grass	*Cynodan dactylon*
29.	Dhab grass	*Desmostachya bipinnata*
30.	Black speargrass	*Heterpog contortu*

1.3.4.3. FAUNA

Fauna of district Sargodha includes different kinds of wild species of mammals, fishes, avifauna, amphibians and reptiles. Among mammals, Wild boars, jackals and wolves are found in abundance in Sargodha district along with wild cats, foxes, mongoose, porcupine, uromastic and furite bat.[41]

In avifauna, Chakur, grey partridges and sissi are commonly found. Black partridges are usually found around the riverine. Quail are also seen in large number during the month of August. On the river as well as on the ponds, various variety of ducks are also observed. In winters, mallard and red-crested poached are also visited. Moreover, other common birds such as eagles, sparrows, house crows, pigeons, red vented bulbul, Myna, hoopoes, doves, partridges, kites, quell, owl, bustards as well as migratory birds such as oriental white backed vulture, long legged buzzard, water fowls, cranes and ducks are also found in Sargodha District.[42]

In Fishes, Rahu (*Labio rohita*) Marakhi (*Cirhina mirgala*), Thaila (*Calta calta*), Silver Carp (*Hypothalmixthys molitrix*) and Gulfam (*Comman Carp*) are commonly found. Apart from these, reptiles and amphibians such as snakes, lizards, cobra turtles and toads are also thriving in Sargodha district.[43]

1.3.4.4. FORESTS

In Sargodha district, the total forest area comprises of about 1403 acres wherein, on canal side the plantation includes 2104 average miles while plantation on roadside includes 365 average kilometers.[44]

[41] Development of Bhalawal Industrial Estate Sargodha. Environmental Impact Assessment Report, 2018. Punjab Industrial Estate Development and Management Company.
[42] Ibid at 11
[43]Mukhtar, M. K., Khan, S. Y., Jabeen, S., Tahir, H. M., Qadir, A., Ahmad, K.R., Butt, A. and Arshad, M. 2013. A Preliminary Checklist of the Spider Fauna of Sargodha (Punjab), Pakistan. *Pakistan Journal of Zoology*. **44**(5): 1245-1254.
[44] Environmental Impact Assessment (EIA) Report of Rehabilitation of SW Sugar Mills Limited, Sillanwali Farooqa Road, District Sargodha Pujnab. Pakistan. Environmental Consultancies & Options (ECO).

02 Legal Landscape

The constitution of Pakistan has substantially altered the allocation of legislative powers between the National and Provincial Assemblies, resulting in more Provincial autonomy. Powers have been assigned to provincial Environmental Protection Agencies/Departments (EPAs/EPDs) Some of the key International/national/local regulations that are considered related to the Integrated Master Plan of Cholistan is briefed below whereas list of important laws is mentioned in Box 2.

National Framework	Provincial Framework
▪ Pakistan Climate Change Act, 2017	▪ Punjab Environment Protection Act, 2017
▪ Forest Act, 1927	▪ Policy on Controlling Smog, 2017
Pakistan Environmental Protection Act, 1997	▪ Punjab Environmental Protection (Delegation of Powers for Environmental Approvals) Rules, 2017
▪ National Climate Change Policy, 2012	▪ Punjab Hospital Waste Management Rules, 2014
▪ Framework for Implementation of Climate Change Policy, 2013	▪ Punjab Environmental Protection Motor Vehicle Rules, 2013
▪ National Sustainable Development Strategy, 2012	▪ Punjab Environmental Protection Administrative Penalty Rules, 2013
▪ National Disaster Risk Reduction Policy, 2013	▪ Regulation of Disclosure of Environmental Information and Citizen Engagement, 2020
▪ National Forest Policy, 2015	▪ Environmental Sampling Rules, 2001
▪ National Rangeland Policy, 2010	▪ Pollution Charge Rules, 2001
▪ Review of IEE / EIA Regulations, 2000	▪ Environmental Tribunal Rules, 2012
▪ National Conservation Strategy, 1992	▪ Punjab Environmental Quality Standards (municipal and liquid effluents, drinking water, motor vehicles, ambient air, noise, treatment of liquid and disposal of biomedical waste and Industrial gaseous emission), 2016.
▪ Biodiversity Action Plan for Pakistan, 2000	
▪ Guidelines for sensitive and critical areas, 1997	▪ Punjab Forest Policy, 2019

2.1. INTERNATIONAL TREATIES AND GOALS

Pakistan has signed multiple multilateral environmental agreements. There are several MEAs that Pakistan is signatory to and the same has to be rectified by each province as environmental matters fall in the domain of provinces as per the Concurrent Legislative List. Major agreements relevant to the current project are United Nations convention to combat desertification and Stockholm convention etc. Convention on desertification is relevant to the given project. The team will also assess guiding documents on Man and Biosphere (MAB) Reserves including MAB Strategy (2015-2025) and technical guidelines.

Sustainable Development Goals (SDGs) recognize climate action and environmental management as an essential component to sustainable development and has a list of dedicated goals to combat them. Being signatory of 2030 Agenda for Sustainable Development, provinces need to ensure that its laws, policies, strategies and plans/programs should be aligned with the SDG goals.

2.1.1. MAN, AND BIOSPHERE (MAB) RESERVES INCLUDING MAB STRATEGY (2015-2025) AND TECHNICAL GUIDELINES

Man, and the Biosphere reserves are areas of terrestrial and coastal marine- ecosystems, internationally recognized under UNESCO's Man and the Biosphere Programme, which innovate and demonstrate approaches to conservation and sustainable development. Biosphere Reserves are intended to promote a balanced relationship between people and nature. Lal Suhanra is a biosphere reserve recognized by UNESCO in 1977 and IUCN Category V protected area. The site is also participating in the Sustainable Management of Marginal Drylands project of MAB's Drylands and Desertification programme (UNESCO, 2019; UNESCO,2012; WWF 2012).

2.2. NATIONAL LAWS, POLICIES AND GUIDELINES

2.2.1. PAKISTAN CONSERVATION STRATEGY

The federal cabinet of Pakistan approved the National Conservation Strategy (NCS) in March 1992.and serves as the country's main environmental policy document. The NCS provides country's main strategy for promoting sustainable development, protecting natural resources, and enhancing natural resource management efficiency.

The NCS includes 68 particular projects in fourteen major areas where policy action is considered critical for Pakistan's natural and physical environment to be preserved. Pollution control and abatement, rangeland restoration, increased energy generation, biodiversity conservation, forestry and plantation support, and cultural heritage protection are all important aspects of the planned project. The national conservation strategy's principles are as follows:

- Achieve better public partnership in management and development
- Integrate environmental and economic considerations into decision-making

Concentrate on long-term improvements in Life quality. The following are the projected areas where NCS must be implemented first.

- Crop land's soil condition.
- Deploy and develop renewable resources.
- Protection of water bodies and sustain fisheries.
- Preserve cultural heritage.
- Protect watersheds areas.
- Integrate environmental and population agendas.
- Restore range lands areas and improve livestock.
- Support institutions for the use of mutual resources.
- Conserve biodiversity.
- Increase irrigation efficiency.
- Support plantations and forestry.
- Increase energy efficiency.
- Abate/prevent pollution.
- Manage urban wastes.

2.2.2. PAKISTAN VISION 2025

The vision 2025 of pakistan45 recognizes the importance of creative, smart and green cities for the economic growth and sustainable development of a region. It highlights climate change as a major threat, associated with increased frequency and intensity of floods, droughts, decline in biodiversity and key natural resources. national legal framework.

2.2.3. NATIONAL WILDLIFE POLICY, 2021

In a recently approved National Wildlife Policy, with the aim of promoting sustainable wildlife usage for the benefit of present and future generations by maintaining and improving the health and diversity of wildlife heritage, including species, habitats, and associated protected areas, across the country.

2.2.4. NATIONAL CLIMATE CHANGE POLICY, 2021

In a recently approved National Climate Change Policy (NCCP), the government has taken an integrated strategy to building resilience in various climate-sensitive sectors and ensuring a substantial response at both the national and subnational levels.

2.2.5. NATIONAL FOREST POLICY PAKISTAN, 2015

The National Forest policy basically governs the planning and economic coordination on forests between provincial governments. The aim of this policy is to promote the long-term development of Pakistan's Renewable Natural Resources (RNR) by preserving and restoring these vital resources, as well as improving the sustainable livelihoods of rural populations, particularly women, children, and other deserving groups.

[45] https://www.pc.gov.pk/uploads/vision2025/Pakistan-Vision-2025.pdf

2.2.6. PAKISTAN TRADE CONTROL OF WILD FAUNA AND FLORA ACT, 2012

This Act defines the rules for the export, re-export, and import of any wild fauna and flora into Pakistan. Such transaction shall be conducted through a customs port of exit or entry, and shall be subject to any other regulation relating to export and import controls in effect at the time. Any individual who attempts or aids in the commission of a crime which is prohibited by this Act.

2.2.7. CANAL AND DRAINAGE ACT, 1873

The Canal and Drainage Act of 1873 prohibits corruption to contaminate or foul water in canals (which includes channels, tube wells, reservoirs, and watercourses), as well as to hinder drainage. This Act will apply to the proposed project's construction and operations and maintenance (O&M) activities.

2.2.8. FOREST ACT, 1927

The Forest Act, which was enacted over 80 years ago, maintains the foundation for forest management. The Forest Act of 1927 has been in effect in most parts of the country since independence. Forests in Punjab and other provinces are still managed under the Forest Act of 1927, with a few amendments. Existing forestry laws are intended to manage the use of forests and plant resources, but they make no explicit provisions for long-term usage or conservation. This Act aims to safeguard forest lands while also regulating forest products. The Forest Act allows governments to create different types of forests, reserve state-owned forest property, take control of privately-owned forest land, and declare any government-owned forest land as a protected area. In reserved and protected regions, the legislation prohibits grazing, hunting, quarrying, clearing for the purpose of cultivation, removing forest produce, and falling or lopping trees and branches.

2.2.9. CUTTING OF TREES ACT, 1975

Without the consent of the Forest Department, tree cutting or chopping is prohibited under this Act. For illegal tree cutting, the statute sanctions a fine or jail, or both, but it makes no provision for compensatory afforestation.

2.2.10. NATIONAL ENVIRONMENTAL QUALITY STANDARDS (CERTIFICATION OF ENVIRONMENTAL LABORATORIES) REGULATIONS, 2000

The provinces have been assigned the authority to certify environmental laboratories under section 6(1) (k) of the PEPA 1997, and they can continue to do so. As previously stated, any changes to these Regulations can only be implemented if Provincial EPAs have been officially authorised in this regard by Provincial Assembly Acts. For laboratories located within the ICT, the Pak EPA will continue to wield these authorities.

2.2.11. NATIONAL ENVIRONMENTAL POLICY, 2005

The National Environment Policy gives the federal government, provincial governments, and local governments broad guidelines for resolving environmental concerns and maintaining effective environmental resource management. The Policy's key goals are environmental resource conservation, restoration, and efficient management. Furthermore, by raising public awareness and mobilising communities, international commitments are met, and demand for the environment is created. Sectoral guidelines on forestry, water supply and management, poverty and the environment, and climate change are all included in the national environment policy.

2.2.12. NATIONAL ENVIRONMENTAL QUALITY STANDARDS (CERTIFICATION OF ENVIRONMENTAL LABORATORIES) REGULATIONS, 2000

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2.2.14. GUIDELINES FOR SENSITIVE AREAS

Archaeological sites, biosphere reserves and natural parks, and wildlife sanctuaries and preserves include in environmentally sensitive areas.

2.3. PROVINCIAL LAWS

After the 18th amendment, the provincial department has promulgated various laws, policies, regulations and guidelines that helps towards better environmental governance that results in protection and conservation of natural environment. Some of these important laws that are relevant to CDA are as under;

2.3.1. PUNJAB PROTECTED AREAS ACT 2020

In this new act, the Government of Punjab defined various types of protected area and also brief the purpose of notifying these protected areas. The act purpose management board and outline functions for implementation of this act. It also empowers department to lay down standards for management and

development of protected areas. This act presented management authorities, offences and penalties for better enforcement of this act.

2.3.2. PUNJAB FOREST POLICY 2019

This policy gives information on how to develop, manage, and optimise forest resources in a way that is scientifically environmentally and environmentally sustainable, ecologically stable, commercially viable, and socially acceptable.

2.3.3. FOREST ACT, 1927 (AMENDED 2016)

This Act provides rules and regulations for the protection of forests, control of timber and other forest-produce transit, village forest and social forestry. This Act establishes rules and regulations for forest protection, timber and other forest-produce transit control, village forest management, and social forestry.

2.3.4. PUNJAB PLANTATION AND MAINTENANCE OF TREES ACT, 1974

This law was enacted by the provincial government in 1974 to control tree plantations and to enact measures to protect tree plantations in the province.

2.3.5. PUNJAB IRRIGATION AND DRAINAGE AUTHORITY ACT, 1997

This Act aims to carry out the Government of Punjab's strategy for streamlining the Irrigation and Drainage System; to replace the existing administrative procedures and setup with more responsive, transparent and efficient arrangements; to achieve cost-effective and efficient operation and maintenance of the irrigation, flood control and drainage systems in the province; and to make the irrigation and drainage network long-term sustainable by introducing new technologies. This Act aims to carry out the Punjab Government's strategy for rearrangement of the Irrigation and Drainage System; to replace prevailing administrative procedures and setup with more approachable, transparent, and efficient arrangements; to achieve efficient and cost-effective operation and maintenance of the province's irrigation, drainage systems; and flood control to make the drainage and irrigation network long-term sustainable by introducing latest technologies.

2.3.6. THE PUNJAB WILDLIFE (PROTECTION, PRESERVATION, CONSERVATION AND MANAGEMENT) (AMENDMENT) ACT, 2007

This legislation establishes a wildlife department and ensures that wildlife is protected.

The purpose of this legislation is to protect, maintain, conserve, and manage wildlife in the Punjab Province. The act is known as the Punjab Wildlife Act of 1974, and it covers the entire province of Punjab. It was updated in 2007. This act creates a wildlife department and ensures the protection of animals.

2.3.7. PUNJAB ENVIRONMENT PROTECTION ACT, 1997 (AMENDED, 2012)

The Federal Ministry of Environment was dissolved after the 18th Constitutional Amendment of Pakistan's Constitution, and the topic of environment was delegated to the provinces. Punjab's EPA has drafted its own legislation. The act's main content is identical to that of PEPA, 1997. The Act deals with a wide range of concerns. Penalties have been established for individuals who violate the Act's requirements.

2.3.8. PUNJAB ENVIRONMENTAL QUALITY STANDARDS (2016)

Punjab has established environmental standards for ambient air, drinking water, industrial emissions, motor vehicle exhaust, noise, municipal and liquid industrial effluents, and liquid and bio-medical waste treatment and disposal by incineration, autoclaving, microwave, and deep burial. All of this is pertinent to the CDA project.

2.3.9. PUNJAB LOCAL GOVERNMENT ACT 2019

Under the Punjab Local Government Act 2019, environmental protection is becoming a more important topic. Local governments may execute the authorities set out in the Punjab LGA 2019 Fifth Schedule.

2.3.10. PUNJAB SPATIAL STRATEGY 2047

The vision of the Punjab spatial strategy emphasises the importance of a clean environment, which has an impact on the community's livability and public health. Cholistan is one of the key areas of the spatial strategy that needs to be addressed as part of the environment component. Furthermore, for a clean, green, and climate resilient Punjab, a consistent effort to mainstream environmental issues is critical

2.3.11. PUNJAB DEVELOPMENT OF CITIES ACT, 1976 ("PDCA")

The main aim of **PDCA** is to provide development of cities in the Punjab and to establish *''a comprehensive system of development and planning in order to improve the quality of life in the cities of the Punjab.''* [46] Clearly, *cities* are not inclusive of the rural area/region and this practice of overlooking of underdeveloped rural areas has resulted in their poor and worse condition. The co-called *integrated approach* does not integrate the development of the urban and rural areas collectively and thereby results in the lack of any course for enforcing this or any other Regional Development Plan.

Despite this obvious gap within the law, interpretation of law purposively can be the key in solving this issue. Although there is no express initiative taken for rural areas or the Act misses the course of implementation of development plans (if any) we can use **section 7** to help our case. The GDA is already under the duty of maintaining comprehensive development planning of the region[47] and to also *coordinate its enactment by the Authority or the Government Agencies within the area*[48]. For more

[46] PDCA, preamble
[47] PDCA, Sec. 7(2)(I)
[48] PDCA, Sec. 7(2)(II)

efficiency, GDA may formulate an Agency/ Agencies and entrust to it such powers and functions as it may deem fit with the approval of the Government.[49]

2.3.12. THE PUNJAB HOUSING AND TOWN PLANNING AGENCY ORDINANCE, 2002

The constitutional guarantees have been re-instated in the preamble of The Punjab Housing and Town Planning Agency Ordinance, 2002 (PHATA). PHATA aims at establishing a comprehensive system of Town Planning at provincial, regional, district, tehsil and union council level in order to ensure systematic, integrated growth of *urban* and *rural areas* in the Province of the Punjab.[50] This means that regional planning for both, urban and rural areas is the responsibility of the provincial governments and PHATA allots this under *section 4* of the Ordinance whereby sub-section 2 (xv) the relevant agencies are to formulate provincial land use policy, plan and prepare *regional development plans* (Inter district spatial planning – Master plans) for an integrated, coordinated and systematic planning.[51] However, the same Ordinance lacks the course that may be employed for implementation of these development plans and extensive studies that have been conducted by various government agencies such as Urban Unit at the instance.

2.3.13. PUNJAB WATER ACT 2019

''An Act to comprehensively manage and regulate water resources in the Punjab in the interest of conservation and sustainability''. The main aim of The Punjab Water Act 2019 was to ensure comprehensive management of all water resources in the Punjab by regulating their use in the interest of conservation and sustainability.

2.3.14. PUNJAB GROWTH STRATEGY 2023

The Punjab Growth Strategy, 2023 states the same mission and targets for "sustainable economic growth and attaining regional equalization."[52] This strategy sees regional equalization as a precondition to attain sustainable growth and without a doubt this also aligns with Pakistan's Sustainable Development Goals (SDGs) commitment.[53] Regardless of these, the absence of an implementation programmed of Regional Development Plans is a glaring example of non-effective policy making by the relevant authorities.

2.3.15. PUNJAB SPATIAL STRATEGY 2047

It may be noted that the Punjab Spatial Strategy 2047 envisaged integration of regional and local development frameworks. The focus of this strategy has primarily been the planning hierarchy which duly deals with regional development frameworks. This shows the intent of the government which wants to progress with development as per the regional plans, however, lacks the effective course of doing so.

[49] PDCA, Sec. 7(2)(XVI)
[50] PHATA Ordinance 2002, Preamble
[51] PHATA Ordinance 2002, sec. 4(2)(xv)
[52] Punjab Growth Strategy 2023, preamble
[53] Sustainable Development Goals, SDGs No. 6, 10, 11, 12

Punjab spatial strategy vision highlights the importance of clean environment which impacts the livability and public health of the community. Bahawalpur is one of the key areas under the spatial strategy which requires attention under the environment component. Moreover, Consistent effort to mainstream environmental concerns is key to a clean, green and climate resilient Punjab.

03 VISION, OBJECTIVES, GOALS

3.1. VISION

A vibrant and internationally competitive region with sustainable development in conducive environment whilst protecting and improving biodiversity where ecological resources are proficiently managed and conserved, cleaner environment, climate resilience and recreational facilities may be important indicators of the region's macro-level socio-economics.

3.2. GOALS

To protect, conserve and retain the ecological values as well as sustainable development of the region for current and future generations, predominantly as a derivation of glory, inspiration, education, recreation and enhance the local community's livelihood.

3.3. OBJECTIVES

This plan helps to prioritize development projects at the regional level based on current conditions and future growth needs. Specific objectives of the plan are as follows:

- To identify potential projects & programs that can contribute to the economic growth, environment protection, conservation, employment opportunities and exploit competitive benefits of region.
- Improve the overall state of environment in Sargodha division.
- Project Prioritization and capacity needs for improve livability and competitiveness.
- Such a plan will fulfill a longstanding demand of local officials to have a document that can provide them a strategic vision for the development of the region and have a voice in the overall planning process in the province.

04 Methodology

The regional plan of Environment sector was developed using participatory approach combined with the field visits of Bahawalpur Region and primary & secondary data analysis at local, regional and national level. The planning exercise involved all relevant key stakeholders (including local community) in identification of key projects, their timelines - short-medium-long term investment plan at district and regional level.

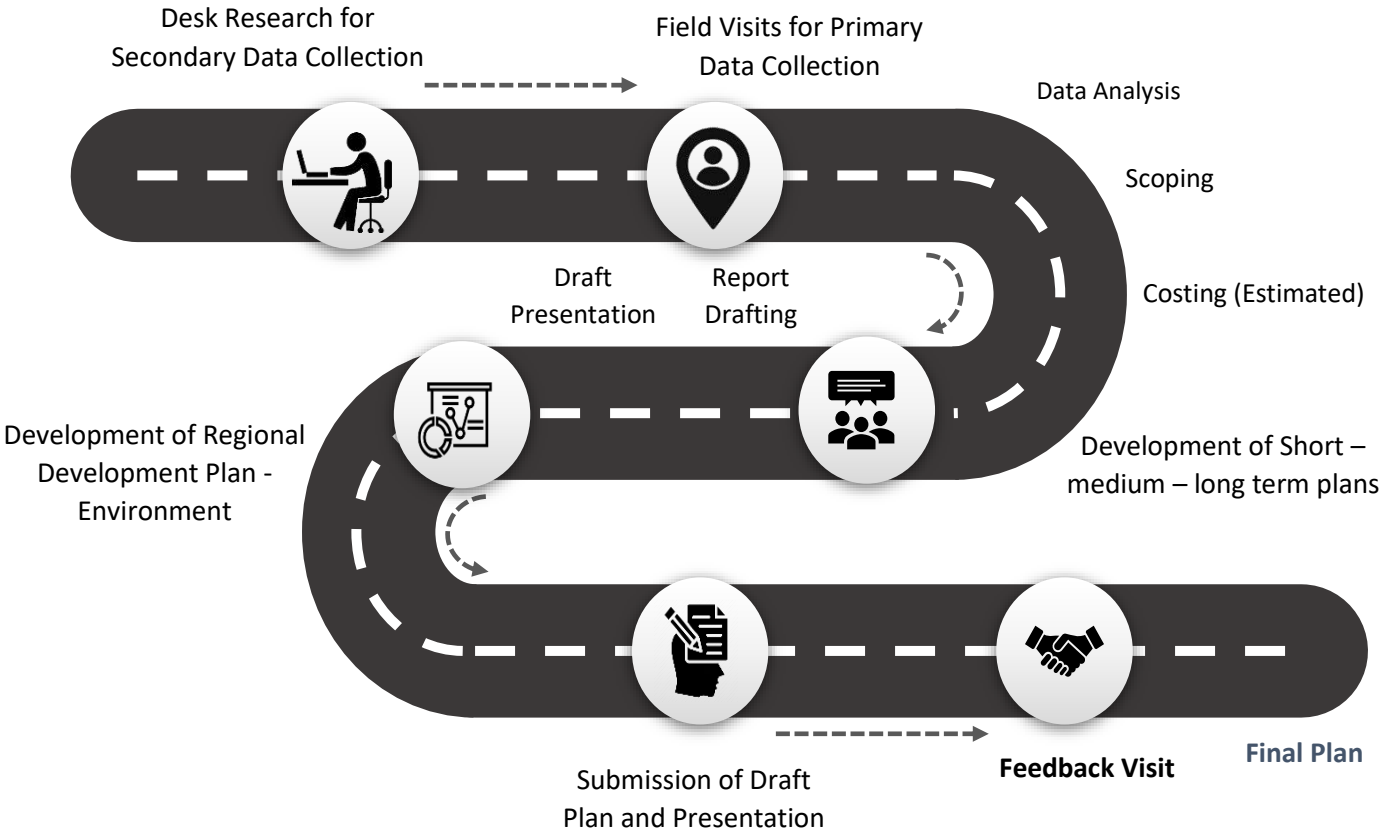


Figure 8: Methodology Map

4.1. DESK RESEARCH

In order to understand, current state of Sargodha District, a comprehensive desk research was conducted. It included review of existing literature studies, Existing legal landscape administrative and institution set-up, relevant plans and programs. Following aspects were obtained through the desk research:

a) Environmental and Ecological Conditions:

It includes quality of physical environmental (air, water, soil) and biological environment (flora, fauna).

b) Socio-Economic Conditions:

It includes population demographics, vulnerable groups, public and private infrastructure, economic profile, and accessibility to basic facilities (clean environment, hospitals, etc.).

c) Institutional arrangements:

It includes determination of institutional hierarchies, inter-linkage of departments, technical and institutional capacity issues, and key stakeholders.

d) Regulatory Frameworks:

It includes review of available regulatory frameworks relevant to environment, forest, climate change and biodiversity, at local, provincial and national level.

4.2. PRIMARY DATA COLLECTION

Primary data on the environment and social quality was collected through multiple field visits, data acquisition through remote sensing, environmental quality assessment, and mapping of existing conditions.

4.2.1. FIELD VISITS

For on-ground information, the team of experts headed by Senior Specialist- Environment and Social Safeguard (includes environmentalist, social sector analyst, GIS professional, remote sensing experts, civil engineer and quantity surveyor) from the Urban Unit conducted multiple field visits (in January, 2022) of Sargodha District. During these visits, data on environmental and climatic conditions, socio-economic scenarios, institutional arrangements, potential impact of disasters, and water availability was collected.

Figure 9: Field visits of Sargodha Region conducted by Environment Team, The Urban Unit

a) Floral Methodology:

The Floral diversity were recorded thoroughly at study area by transects method to collect specimens of plants and also captured photographs for further study and identification to construct inventory. The plant species were identified with the help of available.[54] Local name, life span and habit of plant species also noted with the help of available articles and consultation with local people. The vegetation of desert area is xerophytes and halophytes which are adaptive to the environmental conditions (i.e., high temperature, Saline Soil, Brackish Water, Low precipitation, high Evaporation and Low Nutrients).

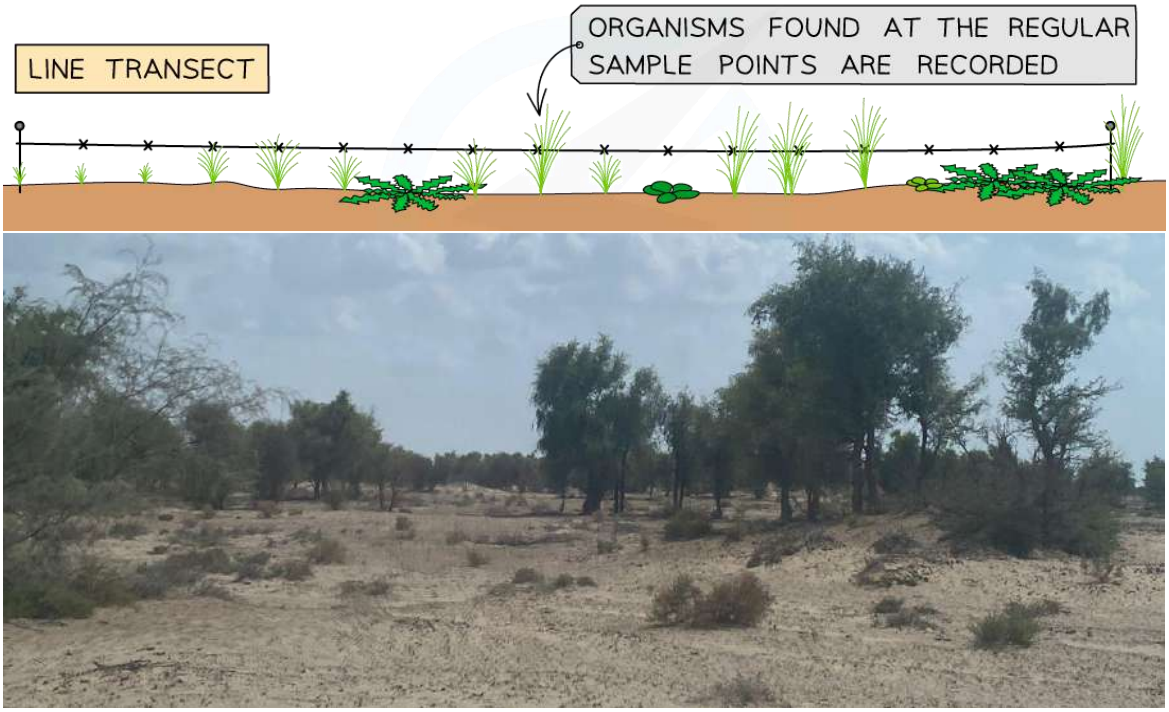
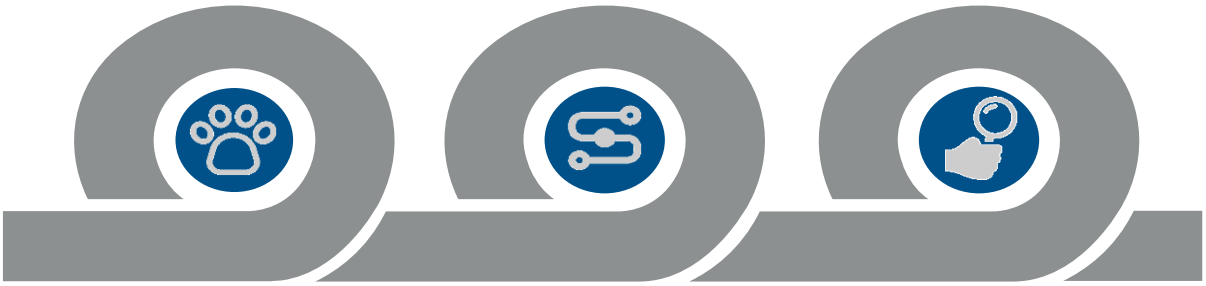


Figure 10: Floral Methodology opted to record Floral diversity of Sargodha Region

[54] http://www.efloras.org

b) Faunal Methodology:

Diversity of animals was recorded by point method, transects method and direct count method to estimate the vertebrate's fauna (Mammals, Birds, Reptiles and Amphibians) of study area in different habitats. During the field trip different evidence (i.e., Footprints, Signs of paths and Birds Sounds) were recorded to enlist the animal presence with the help of guide book. Following three methodology was used to determine fauna diversity of Sargodha District.



Point Method	Transect Method	Direct Count Method
Randomly selected points in different habitats were observed for an hour while staying there to made observations and ensure the variety of fauna at particular habitat.	The study area was also browsed through transect method about 3-5km long transect site selected and availability of animals recoded to enlist the animal presence along the sites.	Study site were also observed by direct count method to construct the inventorying of animal. It is one of the most extensively used approach for determination of the species abundance and diversity.

Figure 11: Methodology opted for determination of Fauna diversity of Sargodha Region

4.2.2. ENVIRONMENTAL QUALITY ASSESSMENT

Data of three air quality parameters (AI, NO_2, and SO_2) were downloaded from Copernicus website for year 2020 used to analyze their spatial pattern over Sargodha District.

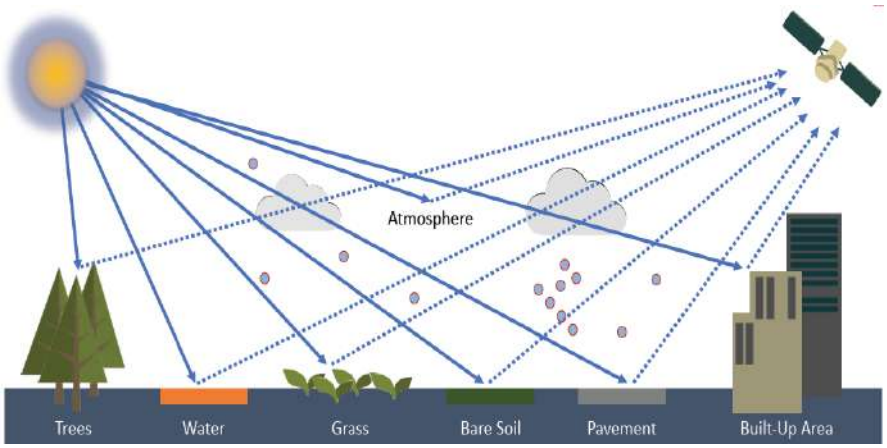


Figure 12: Satellite Measurement Principle

4.3. CONSULTATION MEETINGS WITH GOVERNMENT OFFICIALS

The team hold multiple meetings with the relevant stakeholders, which included officials of government departments and local communities, and explained the purpose of the regional planning exercise and facilitation required by the respective government officials. The Government departments include Commissioner Sargodha, Deputy Commissioner Mianwali, Deputy Commissioner Khushab, Forest Department, Environment Department and Wildlife & Fisheries Department. All officials have assured their full support in development of a realistic and attainable regional development plan.

Commissioner, Sargodha Division

Deputy Commissioner Khushab

Deputy Commissioner Mianwali

Forest Department, Mianwali

Figure 13: Consultation meetings of Env Team with Government Officials of Sargodha Region

4.4. DEVELOPMENT OF SHORT-MEDIUM-LONG TERM PLAN

Based on the exercise discussed above, schemes / projects were identified and prioritized for each district. This ten-year plan provides short term (up to 3 years), Medium Term (3 to 6 years) and long term (up to 10 years) projects focusing on improved service delivery, better environmental quality, enhanced climate resilience along with increased economic growth of the region.

4.5. DEVELOPMENT OF REGIONAL DEVELOPMENT PLAN SARGODHA

Finally, a sectoral plan for Environment component was developed for Sargodha Region with a comprehensive investment Plan for the period of 10 years (2021-2031). Each project contains its title, cost, category (short/medium/long term) and mode of investment (Government / Donor / PPP).

4.6. FEEDBACK VISIT

Consultation is an essential step to engage the multi-stakeholders and get their feedback and ownership in finalizing the project digest for the Sargodha Region. Therefore, a feedback visit will be conducted for final consent from the relevant department before submitting it to the Planning and Development Board, Government of Punjab.

05 Regional Development Plan

5.1. FRAMEWORK

Punjab is the most vibrant as well as the populous province of the Pakistan. However, from past few decades the province is facing challenges not from the economic front but also from the ecological side. The Government of Punjab is well cognizant to the myriad problems that the province is facing. Therefore, in order to tackle these challenges Government of Punjab has taken series of initiatives and drafted various regulation/policies/strategies that address such issues (viz., rapid urbanization, unreliable service provision, low municipal service recovery, high environmental pollution and so forth) and create a regionally equitable economy across the province. As in the province, the public spending is distributed on the basis of administrative jurisdiction i.e., division (region), districts and tehsils, it is desired to consider spatial and socio-economic dimensions for improved service delivery and environmentally sustainable development at a macro scale

Keeping in view of all the facts such as present challenges, risks, gaps, needs and priorities for future economic development, a Framework for Environment Sector of Regional Development Plan of Sargodha is designed. Each component of this framework is passed through a lens of existing infrastructure, governance and population factor. Comparative advantage is gained by using credible mapping resource and Geographic Information Systems (GIS) for spatial representation of relevant data along with current state of environmental conditions. Consultation is another keystone of the RDP drafting process which is done through meetings, data collection forms, field visits, planning exercises and feedback sessions. Finally, the framework is drafted which enlisting the priority projects at district level which are consolidated as one broader plan/project digest of Sargodha Region.

5.2. PROJECT DIGEST/ INVESTMENT PLAN

Based on the framework of regional development plan, desk review/secondary information, on-ground survey, perception and expectation survey, consultations with local community and meetings with local authorities, a Project digest is developed for Sargodha Region, which can also call as Investment Plan. These projects are divided based on their urgency / priority for a ten-year span and divided in to short, medium and long term.

The total cost of the environmental sector project digest for Sargodha Region is Rs. **1510.23** million.

5.2.1. PROPOSED PROJECTS

A. SHORT – TERM PLAN (UP TO 3 YEARS) ESTIMATED

A short-term plan of Sargodha division mainly involves upgradation of existing botanical gardens and zoological museums along with provisions of Bird watching towers and establishment of Air Quality monitoring system. Short Term plan also includes the Conservation of Urial & Chinkara Habitat as well as beautification of Canal and Railway Lines. The following projects and investments are proposed for short-term interventions (up to 3 years);

Table 5: Short - Term Plan for Sargodha Region

Sr. No.	Proposed Projects	Government Entity	Estimated Cost (PKR million)
1.	Sargodha Canal Plantation (250 Av. M)	FWF	21.75
2.	Khushab Canal Plantation (300 Av. M)	FWF	26.10
3.	Mianwali Canal Plantation (200 Av. M)	FWF	17.40
4.	Bhakkar Canal Plantation (200 Av. M)	FWF	17.40
5.	Security Watch Tower	FWF	3.6
6.	Upgradation of Botanical Garden in Sargodha District	FWF	209.64
7.	Mitha Tawana Plantation Khushab (200 Acres)	FWF	8.0
8.	Kundian Plantation Mianwali (500 Acres)	FWF	20.0
9.	Chak Plantation Bhakkar (1100 Acres)	FWF	44.0
10.	Urail Conservation & Protection	FWF	56.4
11.	Chinkara Conservation & Protection	FWF	110.4
12.	Upgradation of Zoological Museum at University of Sargodha	FWF	25
13.	Bird Watching Towers	FWF	50
14.	Air Quality Monitoring System in Sargodha District	EPA	24
15.	Beautification of Sargodha canal	Irrigation / PHA	151.74
16.	Beautification of Sargodha Railway lines	Railway / PHA	58.90
17.	Joharabad Sports Complex	Sports Department	224.1
		Total	**1068.43**
Note: Avenue Miles (Av. M) is unit for linear plantation and equal to 5280 feets.			

B. MEDIUM – TERM PLAN (UP TO 5 YEARS) ESTIMATED

Table 6: Medium - Term Plan for Sargodha Region

Sr. No.	Proposed Projects	Government Entity	Estimated Cost (PKR million)
1.	Dry Afforestation Khushab (100 Acres)	FWF	1.9 (19000 per acre)
2.	Forest Plantation Khushab (200 Acres)	FWF	8.0
3.	Kundian Plantation Mianwali (500 Acres)	FWF	20.0
4.	Chak Plantation Bhakkar (400 Acres)	FWF	16.0
5.	Establishment of Botanical Garden in Khushab and Mianwali (10 Acres each)	FWF & Urban Unit	105 (52.5 each)
6.	Air Quality Monitoring system in Khushab	Urban Unit	20
7.	Establishment of wildlife Museum at Namal Lake	FWF	30
		Total	**200.9**
Note: Avenue Miles (Av. M) is unit for linear plantation and equal to 5280 feets.			

C. LONG – TERM PLAN (UP TO 10 YEARS) ESTIMATED

Table 75: Long - Term Plan for Sargodha Region

Sr. No.	Proposed Projects	Government Entity	Estimated Cost (PKR million)
1.	Dry Afforestation Khushab (100 Acres)	FWF	1.9 (19000 per acre)
2.	Forest Plantation Khushab (200 Acres)	FWF	8.0
3.	Kundian Plantation Mianwali (500 Acres)	FWF	20.0
4.	Chak Plantation Bhakkar (400 Acres)	FWF	16.0
5.	Establishment of Botanical Garden in Bhakkar and Sargodha (10 Acres each)	FWF & Urban Unit	105 (52.5 each)
6.	Air Quality Monitoring System in Bhakkar and Mianwali	Urban Unit	40 (20 each)
		Total	**190.9**
Note: Avenue Miles (Av. M) is unit for linear plantation and equal to 5280 feets.			

5.2.2. PROPOSED PROJECT DETAILS

5.2.2.1. PROJECT 1 – CANAL PLANTATION IN 950 AV MILES IN SARGODHA REGION

SCOPE OF WORK

- The Canal plantation support social forestry and promotes avifauna at canal.
- The plantation along the canals increases growth of trees and shrubs.
- It is helpful to improve environmental status of a particular region.
- It prevents to forms marshes along canals.
- Security watch tower for the protection of Avifauna.

PROPOSED AREAS

- **Sargodha**: 250 Av. M (NB Canal and SB Branch)
- **Khushab**: 300 Av. M (RD Canal)
- **Mianwali**: 200 Av. M
- **Bhakkar**: 200 Av. M

CONCEPTUAL DESIGN

- Plantation: Polyculture (Mix cropping) method
- Design: 6ft x 10ft
- Watch Towers for plantation protection

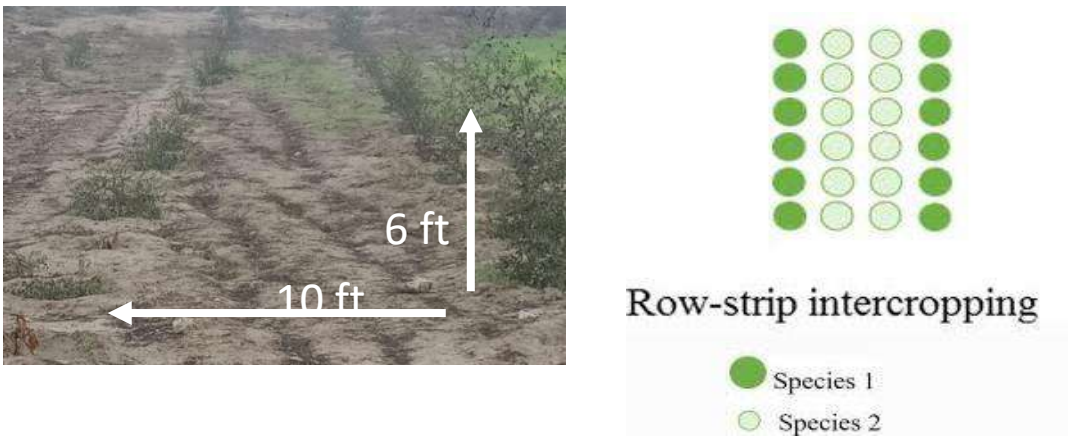
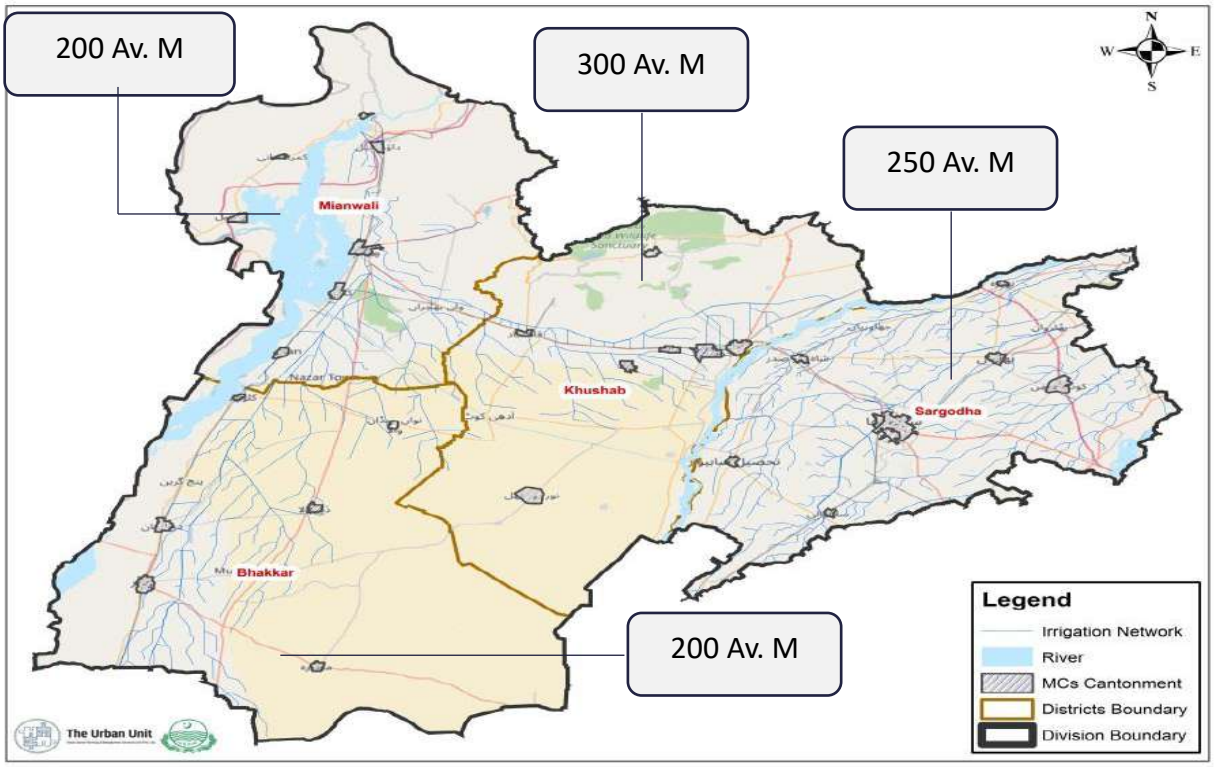


Figure 14: Plantation Design for Canal Plantation



Note: ***1 Av.M is equal to 5280 feet.***

Figure 15: Proposed Area for Canal Plantation in Sargodha Region

Acacia modesta

Prosopis cineraria

Dalbergia Sisso

Ziziphus mauritiana

Acacia nilotica

Tamarix aphylla

Figure 16: Proposed floral species for Canal Plantation

COSTING

MRS, 1st Bi-Annual-2022 (01.01.2022 to 30.06.2022) District Sargodha

Table 8: Canal Plantation

Sr #	Reference	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
1	N.s	Providing and Planting plants @6x10 Ft in the both ways, including cost of plants, digging, trimming & mulching complete in all respects and watch towers.	Av.M	950.00	87,000.00	82,650,000
					Total Amount	**82,650,000**

Table 9: Watch Tower of Society Garud No's 06

Reference	Item No	Description	Unit	Rate (PKR)	As Per Qty	
					Qty	Amount (PKR)*
Ch:-3/21-a-ii	1	Excavation in foundation of the buildings, bridges and the other structures, including refilling around structure with excavated earth, rammiing and watering and lead up to one chain (30 m) and lift up to 5 ft. a) By Manual ii) in the ordinary soil.	%0Cft	8,949.60	50	447.48
Ch:-6/5-i	2	Cement concrete plain include placing, compacting, finishing and curing complete (nominal mix 1: 4: 8)	%Cft	22,746.00	6.25	1,421.63
Ch:-6/6-	3	Reinforced cement concrete in slabs of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e.				

		horizental shuttering) complete in all respects:- :				
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	P.Cft	470.95	37.5	17,660.63
		Column Type A (nominal mix 1: 2: 4)	P.Cft	477.8	236	112,760.80
		Slab (nominal mix 1: 2: 4)	P.Cft	477.8	97.125	46,406.33
Ch:-6/11-c	4	Fabrication of mild steel reinforcement, for cement concrete include cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,399.75	926.563	244,610.18
Ch:-25/38	5	Providing and fixing M.S. angle iron 1½"x1½"x¼" (40x40x6 mm), edge protector nozing of steps of the stairs, having holdfast or 3/8" (10 mm) dia M.S. bars 8" (200 mm) long welded at 2' (600 mm) centre to centre and embedded in cement concrete on steps, complete in all respects.	P.Rft	317.7	19.2	6099.84
N.s	6	solar system 1 Kw solar panel	No	175,000.00	1	175,000.00
					Total Amount	**604,406.88**
					06 x Watch Tower Total Amount	**3,626,441.27**

5.2.2.2. PROJECT 2 – BOTANICAL GARDENS ESTABLISHMENT IN SARGODHA REGION

Botanical gardens make exclusive contributions towards climate change research, public engagement and conservation of biodiversity. With a diverse collection of plant species that grow in natural conditions, historical records, professional staff and other unique resources, it attracts many visitors and volunteers. Botanical garden networks and the spanning biomes along continents could expand the worth of these resources. Over the last decade, research at botanical gardens has advanced our understanding the effects of climate change on plant physiology, phenology, anatomy, and conservation.

The evolution of botanic gardens is inextricably linked with European nations' expeditions and colonial activities from the 15th to the 20th centuries. Many expeditions brought back dried specimens of exotic plants and life, both alive and dried from all over the world, the botanical garden has grown rapidly from the beginning as a natural garden to accommodate these new plants species, usually with the patronage of aristocrats and academic institutions. These newly established gardens competed fiercely to be the first collect, cultivate new and rare specimens, this competition continued until the second half of the 18th and all over the 19th centuries. The power of botanical gardens began to continue on a more economic-oriented role.

SCOPE OF WORK:

Botanical garden in Sargodha is the foremost and first place in this area, which is dedicated to the pursuit of high-quality research on flora, conservation of plant species, medicinal plants, habitat enhancement and nature.

In addition to the scientific research role, the botanical garden is also a significant tourist attraction for visitors. The proposal is establishment of series of Botanical gardens in Khushab, Mianwali, Bhakkar and Sargodha district.

PROPOSED AREAS:

- Sargodha: 10 Acres (Near Sports Complex)
- Khushab: 10 Acres (Kanahti Garden)
- Mianwali: 10 Acres (Kundian Morr)
- Bhakkar: 10 Acres (Dilkushah Bagh)

CONCEPTUAL DESIGN

- Plantation zone is divided into Exhibition lawn, ornamentals, wildlife habitat, cacti lawn, Native plants.
- Public zone comprises of Information Center, Garden center, green house, Toilet Block, Cafeteria, Children Park.

Jallo Botanical Garden, Lahore

Royal Botanical Garden, Kew

Figure 17: Examples of Botanical Garden

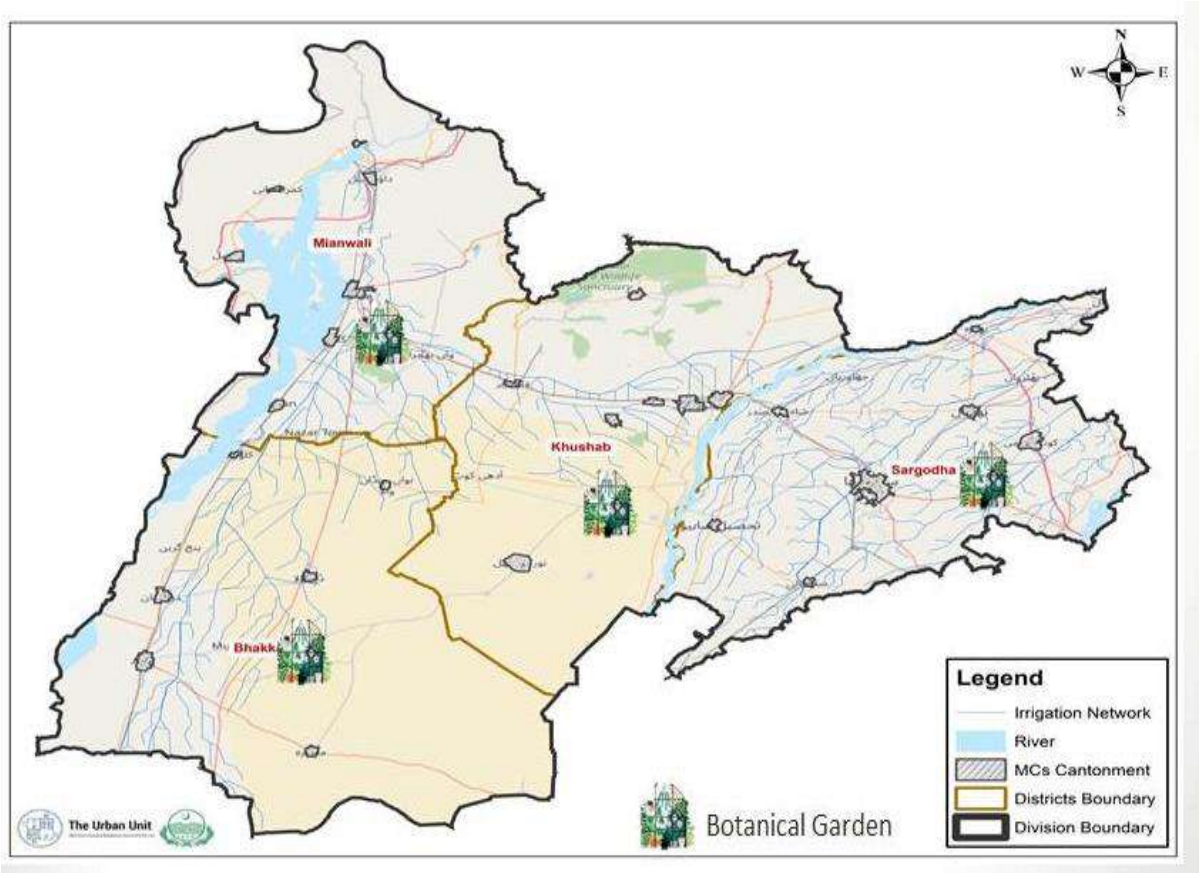


Figure 18: Proposed Botanical gardens in Sargodha Region

REVIVAL & RESTORATION OF SARGODHA BOTANICAL GARDEN HERITAGE BUILDING

The proposal is upgradation of botanical garden heritage building in Sargodha district. This project primarily aims to secure and upgrade the protection of the historic asset heritage within the botanical garden and to enhance the natural conservation value of the heritage building.

LOCATION

- Latitude: 32° 4'24.32"N
- Longitude: 72°40'36.05"E

ARCHITECTURAL STYLE

- British Colonial Architecture

EXISTING CONDITIONS

- Currently used by PHA Sargodha as a store room.
- Half of the structure has been collapsed during rainy season.
- Rehabilitate the structure as it is heritage building in Sargodha botanical garden.
- Source of tourist attraction in botanical garden.

Figure 19: Current situation of Sargodha Heritage Building

3D-CONCEPTUAL DESIGN FOR HERITAGE BUILDING BOTANICAL GARDEN

Figure 20: 3D Conceptual Design for Sargodha Heritage Building

ESTABLISHMENT OF BOTANICAL GARDEN ON 10 ACRES IN MIANWALI

Figure 21: Conceptual Design for Proposed Botanical Garden, Mianwali

ESTABLISHMENT OF BOTANICAL GARDEN ON 10 ACRES IN KHUSHAB

Figure 22: Conceptual Design for Proposed Botanical Garden, Khushab

COSTING

Total Cost of 04 Botanical Garden (01 in each District) = 110.0 million (52.5 M each)

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022)

Table 10: Costing for Construction of Main Gate, Botanical Garden

Ref #	Item No	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
25/10+11	1	Main Gate Steel (small gate and large gate) Fabrication of steel work with flat and round steel bars, plates, angles etc. including cutting, drilling, riveting, handling, assembling fixing, erection and fitting in position. Complete in all respects.	%KG	1,476.00	28,491.80	420,538.97
					Total Amount	**420,538.97**

Table 11: Costing for Horticulture Works

Item No	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
1.0	**Soil Preparation.**				
1.0	Supplying of Canal Silt	1000 Cft	639,485.46	2,000.00	1,278,971
1.1	Supplying of Sweet Soil	1000 Cft	426,323.64	1,200.00	5,115,884
SUB TOTAL. (Soil Preparation)					**6,394,855**
2.0	**Fertilizer & Pesticides.**				
2.1	Supplying of Sweet Soil	Bag	250.00	3,240.00	810,000
2.2	Supplying of Urea	Bag	300.00	1,800.00	540,000
2.3	Supplying of DAP	Bag	200.00	6,550.00	1,310,000
2.4	Supplying of Cow Manure	Bag	50,000.00	12.00	600,000
2.5	Supplying of Termiticides& Pesticides	Liters	200.00	1,800.00	360,000
SUB TOTAL. (Fertilizer & Pesticides)					**3,620,000**

3.0	**Plantation.**				
3.1	Turfing Grass	Sft.	213,161.82	30.00	6,394,854
3.2	Supplying of Large Size Ornamental Trees (Foliage & Flowering)				
i)	Amaltas, Jacoranda, Magnolia, Goldmohr, Dhak, Katchnar, Palms etc	L.S	-	-	500,000
ii)	Ornamental Shrubs (Large Size) Chandni, Chandna, Hibiscus, Tecoma, Jatropha, Murva, Lagestromia etc.	L.S	-	-	367,500
iii)	Climbers(Bougainvillea etc.)	L.S	-	-	595,000
iv)	Perennial Flowering Plants / Ground Cover(Duranta, Nanthra, Eubhorbia, Vinca, Jerbara etc.)	L.S	-	-	200,000
v)	Annual Flowering Plants(Marigold, Petunia, Jafri, Pensy, Anthrinum, etc.)	L.S	-	-	300,000
				SUB TOTAL. (Plantation)	**8,357,354**
				GRAND TOTAL. (1 to 3)	**18,372,209**

Sr #	MRS	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
1.	N.S	Garden Bench-01 6Ft Long	No's	50.00	18,000.00	900,000.00
2.	N.S	Concrete Bench (05)	Lum	20.00	28,800.00	576,000.00
3.	N.S	Dustbin (18")	No's	50.00	10,209.00	510,450.00
4.	N.S	Electric Water Cooler (35Liters) Steel Tank	No's	2.00	35,699.00	71,398.00
5.	N.S	Wooden Gazebo	No's	10.00	350,000.00	3,500,000.00
6.	N.S	Slides 10 ft	No's	10.00	36,750.00	367,500.00
7.	N.S	Round Swing	No's	10.00	45,000.00	450,000.00
8.	N.S	See- Saw (Length-4ft & Hight 1.50ft)	No's	10.00	20,400.00	204,000.00
9.	N.S	Swings	No's	10.00	31,500.00	315,000.00
					Total Amount	**6,894,348.00**

Reference	Item No	Description	Unit	Rate (PKR)	As Per Qty	
					Qty	Amount (PKR)*
3/21(a-ii)	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and ramming lead upto one chain (30 m) and lift upto 5 ft. (1.5 m)	%0Cft	8,949.60	571.73	5,116.71
6/5(i)	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,746.00	172.67	39,275.25
6/6 a-II-3	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects:- :				-
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	Per Cft	354.15	205.53	72,787.12
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-			-	-
		Ratio 1:5	%Cft	23,635.60	593.70	140,324.56
7/5-i)	5	Pacca brick work in ground floor:-			-	

		Ratio 1:5	%Cft	25,483.60	412.95	105,234.53
611-c	6	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars): -				
		Deformed bars (Grade-60)	%Kg	26,392.85	513.82	135,610.59
6/35(b)	7	Providing and laying damp proof course of cement concrete 1:2: 4(using cement, sand and shingle), including bitumen coating:- b) with 2 coats of bitumen: ii) 2" thick (50 mm)	%Sft	7,830.90	62.37	4,884.13
6/34 (a-III)	8	Providing and laying damp proof course with cement sand plaster and bitumen coating: - iii) Ratio 1:2 b) ¾ " thick (20 mm)	%Sft	5,264.80	100.74	5,303.76
11/9-b	9	Cement plaster 1:4 upto 20' (6.00 m) height: - ½" (13 mm) thick	%Sft	2,657.50	1,607.50	42,719.38
3/15+18	10	Filling, watering and ramming earth under floors:- ii)with new earth excavated from outside, lead upto one chain (30 m). Dressing and levelling of earhtwork to designed section, etc Complete a)Ashes, sand, silt or soft soil.	%0Cft	9,989.80	643.26	6,426.00
10/3	11	Providing, laying, watering and ramming brick ballast 1½" to 2"(40 mm to 50 mm) gauge mixed with 25% sand, for floor	%Cft	5,245.80	64.33	3,374.39

		foundation, complete in all respects.				
12/7	12	First class deodar wood wrought joinery in doors and windows etc. panelled, or panelled or glazed, or fully glazed, fixed in position, including chowkat, holdfast, hinges, tower bolts, chocks, robber stop, cleats/ G.I, clamps, handles and chord with hooks etc. complete (excluding sliding bolts or lock):- a) 2" thick (50mm)	Per Sft	2,011.45	105.00	211,202.25
25/53	13	Providing and fixing aluminum Fly screen comprising of Fiber / Aluminium wire guaze (Malasian) fixed aluminium frame of approved manufacturer brownze Colour/ powder coated of size 1-1/2"x1/2”and 1.6 mm thick rubber gasket/ ccost of Hardware approvred and directed by the engineer incharge. Complete in all respect . e.	Per Sft	690.25	16.00	11,044.00
11/22+23	14	Distempering:-. a)new surface:- iii) three coats	%Sft	2,754.15	1,607.50	44,273.03
13/7	15	French polishing complete:- doors a)on new work	%Sft	4,464.80	210.00	9,376.08
9/5+12 & 26/37	16	First class Single layer of brick tiles 9"x4½"x1½" (225x113x40 mm) laid over 4"(100 mm) earth and 1" (25 mm) mud plaster without Bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with two coats of 34 lbs. per %Sft. or 1.72 Kg/Sq.m bitumen coating sand	%Sft	11,779.50	257.30	30,308.95

		blinded with 0.2mm thick polythene sheet. complete in all respects as per drawings and specification, including curing, etc.				
	Roof Drainage					
9/17	19	Plain galvanized iron sheets 22 SWG rain water down pipe including clamp and fixing in position.:				
		a) 4" dia	Rft	344.50	14.00	4,823.00
9/21	20	Rain water down pipe cast iron head fixed in place, including cost of clamp holdfast and painting.				
		a) 4" dia	Each	740.75	6.00	4,444.50
N.s	21	Provide and lay rain water troughs on roof using cement concreter 1:2:4 and finished with 1/2" thick 1:3 in grey cement sand plaster with waterproof agent as per Specifications, whole system leak-free:				
		a) 1'-6" x 1'-6"	No	1,000.00	6.00	6,000.00
	Tile Work					
N.s	22	Provide and lay non-skid ceramic tiles FLOORING of approved manufacturer, laid in 19mm thick 1:3 cement sand mortar bed under-coat and 300mm x 300mm best quality, high finish, imported tiles approved by the Engineer, including filling joints with white cement and matching pigment, complete in all respects as per drawings and	Sft	279.00	168.00	46,872.00

		Specifications and as per sample approved by the Engineer.				
N.s	23	Provide and lay DADO TILES non-skid ceramic tiles 400mm x 400mm best quality, high finish, imported tiles approved by the Engineer in flooring as specified areas, complete in all respects as per drawings and Specifications and as per sample approved by the Engineer.	Sft	141.00	108.00	15,228.00
	Public Health Works					
N.s	24	Pre polished Lasbela Marbles slab 3/4"thick of approved quality color, shade and texture of Lab/ Kitchen counter top set over 3/4" thick 1:3 cement sand mortar i/c bevelling of exposed edges and filling of joints grouted with white cementmixed with pigment.	Sft	280.00	54.00	15,120.00
23/47-b	25	Providing, laying, testing and commissioning of Polypropylene Random Copolymer (PPRC) watersupplypipemadeof (Dadex/Popular/Beta/BBJ)with specifiedpressureratingPN ((PRESSURENOMINAL) andconformingtoDIN8077-8078codei/ ccostofsolvent,specials, makingjharriescomplete nallrespectasapprovedand directedby Engineer Incharge.(Internal/External Diameters mentioned).b) PN-20 pipe				
		(i)(1/2") 20 mm	P.Rft	39	100.00	3,890.00

		ii)(3/4") 25 mm	P.Rft	54	120.00	6,444.00
N.s	28	Provide, fix, join and test BSS 1387 medium quality G.I. pipes for cold water supply "IIL" or "Jamal" make and China make specials (sockets, tees, elbows, bends, crosses, reducers, plugs and union etc.) burried in floor including encasement 1:2:4 ratio with 8 #3 dia steel rebars grade-60 and strips #3 @200 c/c including P.C.C. 1:4:8 in lean concrete, formwork and its removal, excavation, backfill etc; complete.				-
		a) 20 mm outside diameter	Rft	105	100.00	10,500.00
Ch:-19/31	29	Providing and fixing gun metal peet/gate valve (screwed):-				-
		a) 30mm dia	Each	4,435	6.00	26,607.60
Ch:-19/7-i	30	Providing and fitting glazed earthen ware wash hand basin 56x40 cm (22"x16") including bracket set, waste pipe and waste coupling, etc.				-
		white, with pedestal	Each	4,611	4.00	18,444.00
N.s		Providing and fitting English commode	Each	6,870.00	4.00	27,480.00
N.s		Providing and fitting Indian commode	Each	1,275.00	-	-
Ch:-19/35-ii		Providing and fitting "P" trap:-				
		ii) 10 cm (4") glazed.	Each	224	4.00	895.40
Ch:-19/12-i		Providing and fitting glazed earthen ware low down flushing cistern 13.63 litres (3 gallons) capacity, including bracket set, copper connection, etc.				

		i) white	Each	3,601	2.00	7,202.20
N.s	34	Provide and fix Towel Rail NO.2005 Model of M/s Master make or approved equal fixed with rawl plugs and C.P. brass screws as per sample approved, complete.	No.	1,800	4.00	7,200.00
N.s	35	Provide and fix Soap Dish No. 2007 of Master make or approved equal as per sample approved.	No.	1,500	2.00	3,000.00
Ch:-19/35	31	Providing and fitting 10cm (4") gully trap, including cement concrete, cost of PVC grating 15 x 15 cm (6"x 6") and masonry chamber 30x30cm (12"x12")	No.	771	6.00	4,624.80
N.s	32	Provide, cut, fix, join and test uPVC pipe for soil and waste conforming to ISO 3633:1991 (wall thickness=3.2mm) including uPVC fittings with solvent cement jointing "Dadex" make or approved equal, including clamping to walls or under floor, cutting through walls and providing sleeves through concrete for pipelines and pipe fittings including testing of the following diameter.				-
		a) 50mm dia	Rft	250	100.00	25,000.00
		b) 75 mm outside diameter	Rft	300	70.00	21,000.00
N.s	33	Provide and fix uPVC Floor Trap "Dadex" make or approved equivalent including grating, and cover, as approved.				-
		a) 50mm dia	No.	500	6.00	3,000.00

		b) 75mm dia	No.	800	6.00	4,800.00
N.s	34	Provide and fix uPVC Floor Clean out "Dadex": make or approved equal including testing compelete in all respect as per drawings.				-
		a) 75mm dia	No.	650	6.00	3,900.00
N.s	35	Provide and fix install 500 gallon capacity roof water tank "Dura: or "Sun International Co. Pvt. Ltd., or approved equal including all arrangement accessories connections complete in all respects and as per approved by the Engineer.	No.	8,000	4.00	32,000.00
Ch:-21/1	36	Providing and laying R.C.C pipe, moulded with cement concrete 1:1½:3 with spigot or collar joint etc, including cost of Reinforcement, confirming to B.S.S 5911, Part 1981, class "L" including lowering in trenches to correct alignment and grade, jointing, cutting of pipes where necessary finishing and testing complete. (9" dia pipe)	Rft	428	200.00	85,520.00
N.s	37	Construction of square masonary manhole (2'x2') including cover and frame = (Upto 6 ft depth)	No.	4,500	10.00	45,000.00
	Internal Electrification					
Ch:-24/3	38	S/E of PVC pipe for wiring recessed in walls i/c inspection boxes hooks cutting repairing surface etc. 20 mm	P.Rft	61.05	70.00	4,273.50
		25 mm	P.Rft	70.5	50.00	3,525.00

		32 mm	P.Rft	90	50.00	4,500.00
Ch:-24/11	39	Supplying and erection of single core cable PVC insulated etc.				-
		3/0.029"	P.Rft	13.65	45.00	614.25
		7/0.029"	P.Rft	20.9	30.00	627.00
Ch:-24/14	40	Supply and erection of M.S. sheet box of 16 SWG, 10 cm (4") deep, with 4.75 mm thick (3/16") bakelite sheet top, for recessed wiring, including making holes for regulators, switches, plugs, etc.				-
		(10"x10")	Each	197.7	1.00	197.70
Ch:-24/27	41	S/F of botton holder Bracket large size.	Each	67.75	6.00	406.50
Ch:-24/30	42	S/E of switches 5 Amp Paino type	Each	46.9	6.00	281.40
N.s	43	S/E of celling Rose bracket.	Each	200	2.00	400.00
Ch:-24/36	44	S/E of 3 pin switch and plug combine 5 Amp	Each	75.45	6.00	452.70
Ch:-24/36	45	Supply and erection of 3 pin, 10/15 Amp. wall socket. Recessed type.	Each	106.75	6.00	640.50
N.s	46	S/E of roof hook i/c M.S.box 7"x4"	Each	120	2.00	240.00
Ch:-24/26	47	S/E of wall type / pole type bracket with double cover water tight reflector.	Each	657.55	2.00	1,315.10
N.s	50	S/E Downlighter 1x 12W LED Light (Smaart Lights) as approved by the Electrical Engineer.	Each	200	6.00	1,200.00
N.s	51	Supply and installation of Single Phase Meter complete in all respect as approved by the Electrical Engineer.	Each	2500	1.00	2,500.00

N.s	52	S/E of Main Panel Board as shown in the Drawings. Incomming 30 Amp Double Pole 1 No Voltmeter 1 No Amp Meter **Outgoing** 8 Nos. 10 Amp Single Pole Bus Bars 1 No Phase, 1 No Netural, & 1 No. Earth Thimbles	Each	35000	1.00	35,000.00
					Total Amount	**1,352,429.88**

Hard Land Scaping **Inner Side Tuff Pavers with Parking Area**						
Ref #	**Item No**	**Description**	**Unit**	**Rate (PKR)***	**As Per Qty**	
					Qty	**Amount (Rs)**
3/4+24b+25-I	1	Borrowpit excavation undressed lead upto 100 ft (30 metre). Compaction of earthwork with power road roller, including ploughing, mixing, moistening earth to optimum moisture content in layers, etc. complete: i)95% to 100% maximum modified AASHO dry density.	%0Cft	8,376.50	42,088.33	352,552.93
18/3-a(II)	2	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve	% Cft	6,416.25	14,029.44	900,164.23

		100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate.				
10/41-c	3	Providing and laying Tuff pavers,having 7000PSI, crushing strength of approved manufacturer, over 2"to3" sand cushioni/cgrouting with sand in joints i/c finishing to require slope.complete in all respect. 60-mm thick.	P.Sft	127.05	28,058.90	3,564,882.67
					A - Total Amount	**4,817,599.83**
Jogging Track Area						
Ref #	**Item No**	**Description**	**Unit**	**Rate (PKR)***	**As Per Qty**	
					Qty	**Amount (Rs)**
3/50	1	Leveling, dressing and making lawns.	%Cft	422.40	14,955.41	63,171.63
N.s	2	Earth and sand Maksing	Cft	21.00	16,824.83	353,321.45
18/5	3	Providing and laying road edging of 3" (75 mm) wide and 9" (225 mm) deep brick on end, complete in all respects.	Per Rft.	47.35	3,492.33	165,361.83
					B-Total Amount	**581,854.91**
					Grand Total A+B	**5,399,454.74**

Sr #	MRS	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
1.	N.S	Lighting Poles along with J-Bolts (16 Ft Hight)	No's	75.00	22,162.00	1,662,150.00
2.	N.S	Light Fixtures: Outdoor, Pole Mounted, 1-Phase 90 W With Cables	No's	75.00	31,500.00	2,362,500.00
					Total Amount	**4,024,650.00**

Information Centre						
Ref #	**Item No**	**Description**	**Unit**	**Rate (PKR)***	**As Per Qty**	
					Qty	**Amount (Rs)**
Scheduled Items						
3/21(a-ii)	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and ramming lead upto one chain (30 m) and lift upto 5 ft. (1.5 m)	%0 Cft	8,727.85	468.75	4,091.18
6/5(i)	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,563.35	467.44	105,469.56
6/6 a-II-3	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring				-

		form work (i.e. horizental shuttering) complete in all respects:- :				
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	Per Cft	350.30	326.81	114,482.42
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-			-	-
		Ratio 1:5	%Cft	23,797.80	492.19	117,129.80
7/7-i)	5	Pacca brick work other than building upto 10ft. (3 m) hight			-	
		Ratio 1:5	%Cft	24,684.95	614.63	151,719.87
6/11-c	6	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,339.05	817.03	215,198.27
6/35(b)	7	Providing and laying damp proof course of cement concrete 1:2: 4(using cement, sand and shingle), including bitumen coating :- b) with 2 coats of bitumen: ii) 2" thick (50 mm)	%Sft	7,786.75	70.31	5,475.06
6/37 (a-i)	8	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating:-(a) with one coat of bitumen	%Sft	4,201.55	140.63	5,908.43

		and one coat of polythene sheet 500 gauge:				
11/9-b	9	Cement plaster 1:4 upto 20' (6.00 m) height:- ½" (13 mm) thick	%Sft	2,595.85	2,410.63	62,576.21
3/15+18	10	Filling, watering and ramming earth under floors:- ii)with new earth excavated from outside, lead upto one chain (30 m). Dressing and levelling of earhtwork to designed section, etc Complete a)Ashes, sand, silt or soft soil.	%0Cft	4,734.70	1,307.25	6,189.44
10/3	11	Providing, laying, watering and ramming brick ballast 1½" to 2"(40 mm to 50 mm) gauge mixed with 25% sand, for floor foundation, complete in all respects.	%Cft	5,251.30	217.66	11,429.83
10/24-i	12	Providing andl aying superb quality Ceramic tile floors of Master brand of specified size, Glossy/Matt/Texture of approved Color and Shade as per approved design with adhesive bond, over3/4"thick(1;2) cements and plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete in all respects and as approved and directed by the Engineer Incharge.				-

		i) 12"x18"/12"x24"/10"x24" /8"x24"/12"x36"	P.Sft	202.80	653.63	132,555.15
12/7	13	First class deodar wood wrought joinery in doors and windows etc. panelled, or panelled or glazed, or fully glazed, fixed in position, including chowkat, holdfast, hinges, tower bolts, chocks, robber stop, cleats/ G.I, clamps, handles and chord with hooks etc. complete (excluding sliding bolts or lock):- a) 2" thick (50mm)	Per Sft	2,073.25	28.00	58,051.00
25/53	14	Providing and fixing Aluminum Fly screen comprising of Fiber/Aluminum wire guaze (Malasian) fixed in aluminum frame of approved manufacturer brownze Colour/powder coated of size1-1/2"x1/2"and1.6mm thick with rubber gasket i/c cost of Hardwares as approved and directed by the engineer incharge complete in all respect.	Per Sft	688.35	90.00	61,951.50
11/23	15	Distempering:-. a)new surface:- iii) three coats	%Sft	2,714.75	2,410.63	65,442.44

13/7	16	French polishing complete:- doors a)on new work	%Sft	4,280.00	56.00	2,396.80
9/5+12 & 26/37	17	First class Single layer of brick tiles 9"x4½"x1½" (225x113x40 mm) laid over 4"(100 mm) earth and 1" (25 mm) mud plaster without Bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with two coats of 34 lbs. per %Sft. or 1.72 Kg/Sq.m bitumen coating sand blinded with 0.2mm thick polythene sheet. complete in all respects as per drawings and specification, including curing, etc.	%Sft	11,759.10	653.63	76,860.42
	19	Provision for Water Supply system i/c cost 1/2" dia i/d pipe and pipe specials water tap etc.	Job	50,000.00	1.00	50,000.00
Internal Electrification						
Ch:-24/3	20	S/E of PVC pipe for wiring recessed in walls i/c inspection boxes hooks cutting repairing surface etc. 20 mm	P.Rft	69.4	200.00	13,880.00
		25 mm	P.Rft	80.45	100.00	8,045.00
		32 mm	P.Rft	103.6	100.00	10,360.00
Ch:-24/11	21	Supplying and erection of single core cable PVC insulated etc.				-
		3/0.029"	P.Rft	20.2	150.00	3,030.00
		7/0.029"	P.Rft	32.25	300.00	9,675.00

Ch:-24/14	22	Supply and erection of M.S. sheet box of 16 SWG, 10 cm (4") deep, with 4.75 mm thick (3/16") bakelite sheet top, for recessed wiring, including making holes for regulators, switches, plugs, etc.				-
		(8"x10")	Each	576.4	10.00	5,764.00
Ch:-24/27	23	S/F of botton holder Bracket large size.	Each	64.85	10.00	648.50
Ch:-24/30	24	S/E of switches 5 Amp Paino type	Each	38.3	10.00	383.00
N.s	25	S/E of celling Rose bracket.	Each	200	2.00	400.00
Ch:-24/36	26	S/E of 3 pin switch and plug combine 5 Amp	Each	75.45	5.00	377.25
Ch:-24/36	27	Supply and erection of 3 pin, 10/15 Amp. wall socket. Recessed type.	Each	101.65	5.00	508.25
N.s	28	S/E of roof hook i/c M.S.box 7"x4"	Each	120	5.00	600.00
Ch:-24/26	29	S/E of wall type / pole type bracket with double cover water tight reflector.	Each	581.5	2.00	1,163.00
N.s	30	S/E of A.C. celling fan Royal/Asia 56" sweep	Each	5500	6.00	33,000.00
Ch:-24/79	31	Supplying and fitting of regulator knob with shaft.etc.	Each	124.25	2.00	248.50
N.s	32	S/E Downlighter 1x 12W LED Light (Smaart Lights) as approved by the Electrical Engineer.	Each	200	12.00	2,400.00
N.s	33	Supply and installation of Single Phase Meter complete in all respect as approved by the Electrical Engineer.	Each	2500	1.00	2,500.00
N.s	34	S/E of Main Panel Board as shown in the Drawings.	Each	35000	1.00	35,000.00

		Incomming 30 Amp Double Pole				
		1 No Voltmeter				
		1 No Amp Meter				
		Outgoing				
		8 Nos. 10 Amp Single Pole				
		Bus Bars 1 No Phase, 1 No Netural, & 1 No. Earth				
		Thimbles				
N.s	35	Supply and installation of Walls Ac complete in all respect.	Each	81,000.00	3.00	243,000.00
Furniture and Fixture						
N.s	36	Chairs	No's	12000	20.00	240,000.00
N.s	37	Workstations	Each	6520	2.00	13,040.00
N.s	38	Clock	Each	1000	2.00	2,000.00
N.s	39	Dust bins	Each	500	2.00	1,000.00
					Total Amount	**1,873,949.87**

Construction of Cafeteria						
Ref #	**Item No**	**Description**	**Unit**	**Rate (PKR)***	**As Per Qty**	
					Qty	**Amount (Rs)**
3/21(a-ii)	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and ramming lead upto one chain (30 m) and lift upto 5 ft. (1.5 m)	%0Cft	8,727.85	356.25	3,109.30

6/5(i)	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,563.35	375.19	84,654.87
6/6 a-II-3	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects:- :				-
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	Per Cft	350.30	208.69	73,103.23
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-				
		Ratio 1:5	%Cft	23,797.80	374.06	89,018.65
7/7-i)	5	Pacca brick work in ground floor:-			-	
		Ratio 1:5	%Cft	24,684.95	345.00	85,163.08
6/11-c	6	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,339.05	521.72	137,415.76

6/35(b)	7	Providing and laying damp proof course of cement concrete 1:2: 4(using cement, sand and shingle), including bitumen coating :- b) with 2 coats of bitumen: ii) 2" thick (50 mm)	%Sft	7,786.75	53.44	4,161.04
6/37 (a-i)	8	Providing and laying damp proof course with cement sand plaster and bitumen coating:- iii) Ratio 1:2 b) ¾ " thick (20 mm)	%Sft	4,201.55	106.88	4,490.41
11/9-b	9	Cement plaster 1:4 upto 20' (6.00 m) height:- ½" (13 mm) thick	%Sft	2,595.85	1,432.38	37,182.31
3/15+18	10	Filling, watering and ramming earth under floors:- ii)with new earth excavated from outside, lead upto one chain (30 m). Dressing and levelling of earhtwork to designed section, etc Complete a)Ashes, sand, silt or soft soil.	%0Cft	4,734.70	834.75	3,952.29
10/3	11	Providing, laying, watering and ramming brick ballast 1½" to 2"(40 mm to 50 mm) gauge mixed with 25% sand, for floor foundation, complete in all respects.	%Cft	5,251.30	138.99	7,298.57
10/24-i	12	Providing and laying superb quality Ceramic tile floors of Master brand of specified size, Glossy/Matt/Texture of approved Color and Shade as preapproved design with adhesive bond, over3/4" thick(1;2) cements and plaster i/c the cost of sealer				

		for finishing the joints i/c cutting grinding complete in all respects and as approved and directed by the Engineer Incharge.				
		i) 12"x18"/12"x24"/10"x24" /8"x24"/12"x36"	P.Sft	202.80	417.38	84,643.65
12/7	13	First class deodar wood wrought joinery in doors and windows etc. panelled, or panelled or glazed, or fully glazed, fixed in position, including chowkat, holdfast, hinges, tower bolts, chocks, robber stop, cleats/ G.I, clamps, handles and chord with hooks etc. complete (excluding sliding bolts or lock):-a) 2" thick (50mm)	Per Sft	2,073.25	35.00	72,563.75
25/53	14	Providing and fixing Aluminum Fly screen comprising of Fiber/Aluminum wireguaze (Malasian) fixedin aluminum frame of approved manufacturer brownze Colour/powdercoatedofsize1-1/2"x1/2"and1.6mm thick withrubbergasket i/c cost of Hardware as approved and directed by the engineer incharge. Complete in all respect.	Per Sft	688.35	60.00	41,301.00
11/23	15	Distempering:-. a)new surface:- iii) three coats	%Sft	2,714.75	1,432.38	38,885.40
13/7	16	French polishing complete:- doors a)on new work	%Sft	4,280.00	70.00	2,996.00

9/5+12 & 26/37	17	First class Single layer of brick tiles 9"x4½"x1½" (225x113x40 mm) laid over 4"(100 mm) earth and 1" (25 mm) mud plaster without Bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with two coats of 34 lbs. per %Sft. or 1.72 Kg/Sq.m bitumen coating sand blinded with 0.2mm thick polythene sheet. complete in all respects as per drawings and specification, including curing, etc.	%Sft	11,759.10	-	-
Internal Electrification						
Ch:-24/3	18	S/E of PVC pipe for wiring recessed in walls i/c inspection boxes hooks cutting repairing surface etc. 20 mm	P.Rft	50.2	170.00	8,534.00
		25 mm	P.Rft	58.45	100.00	5,845.00
		32 mm	P.Rft	74.65	110.00	8,211.50
Ch:-24/11	19	Supplying and erection of single core cable PVC insulated etc.				-
		3/0.029"	P.Rft	12.1	100.00	1,210.00
		7/0.029"	P.Rft	19.35	200.00	3,870.00
Ch:-24/14	20	Supply and erection of M.S. sheet box of 16 SWG, 10 cm (4") deep, with 4.75 mm thick (3/16") bakelite sheet top, for recessed wiring, including making holes for regulators, switches, plugs, etc.				-
		(8"x10")	Each	446.1	1.00	446.10
Ch:-24/27	21	S/F of botton holder Bracket large size.	Each	64.85	10.00	648.50
Ch:-24/30	22	S/E of switches 5 Amp Paino type	Each	38.3	10.00	383.00

N.s	23	S/E of celling Rose bracket.	Each	200	2.00	400.00
Ch:-24/36	24	S/E of 3 pin switch and plug combine 5 Amp	Each	75.45	10.00	754.50
Ch:-24/36	25	Supply and erection of 3 pin, 10/15 Amp. wall socket. Recessed type.	Each	101.65	10.00	1,016.50
N.s	26	S/E of roof hook i/c M.S.box 7"x4"	Each	120	10.00	1,200.00
Ch:-24/26	27	S/E of wall type / pole type bracket with double cover water tight reflector.	Each	581.5	10.00	5,815.00
N.s	28	S/E of A.C. celling fan Royal/Asia 56" sweep	Each	6500	2.00	13,000.00
Ch:-24/79	29	Supplying and fitting of regulator knob with shaft.etc.	Each	124.25	2.00	248.50
N.s	30	S/E Downlighter 1x 12W LED Light (Smaart Lights) as approved by the Electrical Engineer.	Each	200	12.00	2,400.00
N.s	31	Supply and installation of Single Phase Meter complete in all respect as approved by the Electrical Engineer.	Each	2500	1.00	2,500.00
N.s	32	S/E of Main Panel Board as shown in the Drawings. Incomming 30 Amp Double Pole 1 No Voltmeter 1 No Amp Meter **Outgoing** 8 Nos. 10 Amp Single Pole Bus Bars 1 No Phase, 1 No Netural, & 1 No. Earth Thimbles	Each	35000	1.00	35,000.00
N.s	33	**Furniture and Fixture**				
N.s	34	Chairs	No's	12,000.00	6.00	72,000.00
N.s	35	Clock	No's	2,000.00	1.00	2,000.00
N.s	36	Table	No's	25,000.00	3.00	75,000.00

N.s	37	Side tables	No's	10,000.00	1.00	10,000.00
N.s	38	Sofa (1 seater)	No's	15,000.00	2.00	30,000.00
N.s	39	Sofa (2 seater)	No's	30,000.00	2.00	60,000.00
N.s	40	Sofa (3 seater)	No's	45,000.00	2.00	90,000.00
N.s	41	Dust bins	No's	1,000.00	2.00	2,000.00
					Total Amount	**1,202,421.90**

Office Block						
Ref #	**Item No**	**Description**	**Unit**	**Rate (PKR)***	**As Per Qty**	
					Qty	**Amount (Rs)**
3/21(a-ii)	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and ramming lead upto one chain (30 m) and lift upto 5 ft. (1.5 m)	%0Cft	8,949.60	472.97	4,232.91
6/5(i)	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,746.00	268.40	61,049.43
6/6 a-II-3	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects:- :				-

		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	Per Cft	354.15	251.07	88,917.77
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-				
		Ratio 1:5	%Cft	23,635.60	515.97	121,952.61
7/7-i)	5	Pacca brick work in ground floor:-			-	
		Ratio 1:5	%Cft	25,483.60	604.09	153,943.24
6/11-c	6	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,392.85	627.68	165,663.80
6/35(b)	7	Providing and laying damp proof course of cement concrete 1:2: 4(using cement, sand and shingle), including bitumen coating :- b) with 2 coats of bitumen: ii) 2" thick (50 mm)	%Sft	7,830.90	64.50	5,050.64
6/34 (a-III)	8	Providing and laying damp proof course with cement sand plaster and bitumen coating:- iii) Ratio 1:2 b) ¾ " thick (20 mm)	%Sft	5,264.80	128.99	6,791.20
11/9-b	9	Cement plaster 1:4 upto 20' (6.00 m) height:- ½" (13 mm) thick	%Sft	2,657.50	2,167.55	57,602.57

3/15+18	10	Filling, watering and ramming earth under floors:- ii)with new earth excavated from outside, lead upto one chain (30 m). Dressing and levelling of earhtwork to designed section, etc Complete a)Ashes, sand, silt or soft soil.	%0Cft	9,989.80	1,255.37	12,540.88
10/3	11	Providing, laying, watering and ramming brick ballast 1½" to 2"(40 mm to 50 mm) gauge mixed with 25% sand, for floor foundation, complete in all respects.	%Cft	5,245.80	167.22	8,771.77
12/7	12	First class deodar wood wrought joinery in doors and windows etc. panelled, or panelled or glazed, or fully glazed, fixed in position, including chowkat, holdfast, hinges, tower bolts, chocks, robber stop, cleats/ G.I, clamps, handles and chord with hooks etc. complete (excluding sliding bolts or lock):- a) 2" thick (50mm)	Per Sft	2,011.45	24.50	49,280.53
25/53	13	Providing and fixing Aluminum Fly screen comprising of Fiber/Aluminum wireguaze (Malasian) fixedin aluminum frame of approved manufacturer brownze Colour/powdercoatedofsize1-1/2"x1/2"and1.6mm thick withrubbergasket i/c cost of Hardware as approved and directed by the engineer incharge. Complete in all respect.	Per Sft	690.25	30.00	20,707.50

11/22+23	14	Distempering:-. a)new surface:- iii) three coats	%Sft	2,754.15	2,167.55	59,697.51
13/7	15	French polishing complete:-doors a)on new work	%Sft	4,464.80	49.00	2,187.75
9/5+12 & 26/37	16	First class Single layer of brick tiles 9"x4½"x1½" (225x113x40 mm) laid over 4"(100 mm) earth and 1" (25 mm) mud plaster without Bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with two coats of 34 lbs. per %Sft. or 1.72 Kg/Sq.m bitumen coating sand blinded with 0.2mm thick polythene sheet. complete in all respects as per drawings and specification, including curing, etc.	%Sft	11,779.50	502.15	59,150.46
Roof Drainage						
9/17	17	Plain galvanized iron sheets 22 SWG rain water down pipe including clamp and fixing in position.:				
		a) 4" dia	Rft	344.50	14.00	4,823.00
9/21	18	Rain water down pipe cast iron head fixed in place, including cost of clamp holdfast and painting.				-
		a) 4" dia	No	740.75	2.00	1,481.50
N.s	19	Provide and lay rain water troughs on roof using cement concreter 1:2:4 and finished with 1/2" thick 1:3 in grey cement sand plaster with waterproof agent as per Specifications, whole system leak-free:				-
		a) 1'-6" x 1'-6"	No	1,000.00	2.00	2,000.00

PUBLIC HEALTH WORKS						
N.s	20	Pre polished Lasbela Marbles slab 3/4"thick of approved quality color, shade and texture of Lab/ Kitchen counter top set over 3/4" thick 1:3 cement sand mortar i/c bevelling of exposed edges and filling of joints grouted with white cementmixed with pigment.	Sft	280.00	-	-
23/47-b	21	Providing, laying, testing and commissioning of Polypropylene Random Copolymer (PPRC) watersupplypipemadeof (Dadex/Popular/Beta/BBJ)with specifiedpressureratingPN ((PRESSURENOMINAL) andconformingtoDIN8077-8078codei/ ccostofsolvent,specials, makingjharriescomplete nallrespectasapprovedand directedby Engineer Incharge.(Internal/External Diameters mentioned).b) PN-20 pipe				
		(i)(1/2") 20 mm	Rft	39	20.00	778.00
		ii)(3/4") 25 mm	Rft	54	30.00	1,611.00
N.s	22	Provide, fix, join and test BSS 1387 medium quality G.I. pipes for cold water supply "IIL" or "Jamal" make and China make specials (sockets, tees, elbows, bends, crosses, reducers, plugs and union etc.) burried in floor including encasement 1:2:4 ratio with 8 #3 dia steel rebars grade-60 and strips #3 @200 c/c including P.C.C. 1:4:8 in				

		lean concrete, formwork and its removal, excavation, backfill etc; complete.				
		a) 20 mm outside diameter	Rft	105	20.00	2,100.00
Ch:-19/31	23	Providing and fixing gun metal peet/gate valve (screwed):-				-
		a) 30mm dia	Each	4,435	1.00	4,434.60
Ch:-19/7-i	24	Providing and fitting glazed earthen ware wash hand basin 56x40 cm (22"x16") including bracket set, waste pipe and waste coupling, etc.				-
		white, with pedestal	Each	4,611	1.00	4,611.00
N.s		Providing and fitting English commode	Each	6,870.00	1.00	6,870.00
N.s		Providing and fitting Indian commode	Each	1,275.00	-	-
Ch:-19/35-ii		Providing and fitting "P" trap:-				
		ii) 10 cm (4") glazed.	Each	224	1.00	223.85
Ch:-19/12-i		Providing and fitting glazed earthen ware low down flushing cistern 13.63 litres (3 gallons) capacity, including bracket set, copper connection, etc.				
		i) white	Each	3,601	1.00	3,601.10
N.s	25	Provide and fix Towel Rail NO.2005 Model of M/s Master make or approved equal fixed with rawl plugs and C.P. brass screws as per sample approved, complete.	No.	1,800	1.00	1,800.00
N.s	26	Provide and fix Soap Dish No. 2007 of Master make or approved equal as per sample approved.	No.	1,500	1.00	1,500.00
Ch:-19/35	27	Providing and fitting 10cm (4") gully trap, including cement	No.	771	1.00	770.80

		concrete, cost of PVC grating 15 x 15 cm (6"x 6") and masonry chamber 30x30cm (12"x12")				
N.s	28	Provide, cut, fix, join and test uPVC pipe for soil and waste conforming to ISO 3633:1991 (wall thickness=3.2mm) including uPVC fittings with solvent cement jointing "Dadex" make or approved equal, including clamping to walls or under floor, cutting through walls and providing sleeves through concrete for pipelines and pipe fittings including testing of the following diameter.				-
		a) 50mm dia	Rft	250	20.00	5,000.00
		b) 75 mm outside diameter	Rft	300	30.00	9,000.00
N.s	29	Provide and fix uPVC Floor Trap "Dadex" make or approved equivalent including grating, and cover, as approved.				-
		a) 50mm dia	No.	500	1.00	500.00
		b) 75mm dia	No.	800	1.00	800.00
N.s	30	Provide and fix uPVC Floor Clean out "Dadex": make or approved equal including testing compelete in all respect as per drawings.				-
		a) 75mm dia	No.	650	1.00	650.00
N.s	31	Provide and fix install 500 gallon capacity roof water tank "Dura: or "Sun International Co. Pvt. Ltd., or approved equal including all arrangement accessories connections	No.	8,000	1.00	8,000.00

		complete in all respects and as per approved by the Engineer.				
Ch:-21/1	32	Providing and laying R.C.C pipe, moulded with cement concrete 1:1½:3 with spigot or collar joint etc, including cost of Reinforcement, confirming to B.S.S 5911, Part 1981, class "L" including lowering in trenches to correct alignment and grade, jointing, cutting of pipes where necessary finishing and testing complete. (9" dia pipe)	Rft	428	50.00	21,380.00
N.s	33	Construction of square masonary manhole (2'x2') including cover and frame = (Upto 6 ft depth)	No.	4,500	1.00	4,500.00
	Internal Electrification					
Ch:-24/3	34	S/E of PVC pipe for wiring recessed in walls i/c inspection boxes hooks cutting repairing surface etc. 20 mm	P.Rft	61.05	70.00	4,273.50
		25 mm	P.Rft	70.5	50.00	3,525.00
		32 mm	P.Rft	90	50.00	4,500.00
Ch:-24/11	35	Supplying and erection of single core cable PVC insulated etc.				-
		3/0.029"	P.Rft	13.65	55.00	750.75
		7/0.029"	P.Rft	20.9	75.00	1,567.50
Ch:-24/14	36	Supply and erection of M.S. sheet box of 16 SWG, 10 cm (4") deep, with 4.75 mm thick (3/16") bakelite sheet top, for recessed wiring, including making holes for regulators, switches, plugs, etc.				-
		(10"x10")	Each	197.7	1.00	197.70

Ch:-24/27	37	S/F of botton holder Bracket large size.	Each	67.75	3.00	203.25
Ch:-24/30	38	S/E of switches 5 Amp Paino type	Each	46.9	7.00	328.30
N.s	39	S/E of celling Rose bracket.	Each	200	2.00	400.00
Ch:-24/36	40	S/E of 3 pin switch and plug combine 5 Amp	Each	75.45	7.00	528.15
Ch:-24/36	41	Supply and erection of 3 pin, 10/15 Amp. wall socket. Recessed type.	Each	106.75	7.00	747.25
N.s	42	S/E of roof hook i/c M.S.box 7"x4"	Each	120	2.00	240.00
Ch:-24/26	43	S/E of wall type / pole type bracket with double cover water tight reflector.	Each	657.55	2.00	1,315.10
N.s	44	S/E Downlighter 1x 12W LED Light (Smaart Lights) as approved by the Electrical Engineer.	Each	250	7.00	1,750.00
N.s	45	S/E of Fan	Each	6500	4.00	26,000.00
N.s	46	Supply and installation of Single Phase Meter complete in all respect as approved by the Electrical Engineer.	Each	2500	1.00	2,500.00
N.s	47	S/E of Main Panel Board as shown in the Drawings. Incomming 30 Amp Double Pole 1 No Voltmeter 1 No Amp Meter **Outgoing** 8 Nos. 10 Amp Single Pole Bus Bars 1 No Phase, 1 No Netural, & 1 No. Earth Thimbles	Each	35000	1.00	35,000.00
					Total Amount	**1,047,801.92**

Children Play Area						
Mrs Ref#	Item No.	Description	Unit	Rate (PKR)	As Per Qty	
					Qty	Amount (Rs)
		Provisin for Children play items (play gadget) Complete in all respect	Lm	1,000,000.00	1	1,000,000.00
					Total Amount	**1,000,000.00**

Children Play Area						
Mrs Ref#	Item No.	Description	Unit	Rate (PKR)	As Per Qty	
					Qty	Amount (Rs)
N.s	1	Providing and fixing of Sign boards for Park	No's	75,000.00	10.00	750,000.00
					Total Amount	**750,000.00**

UNDER GROUND WATER TANK (5' x 5' x 5')						
Mrs Ref#	Item No.	Description	Unit	Rate (PKR)	As Per Qty	
					Qty	Amount (Rs)
3/21(a-ii)	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and ramming lead upto one chain (30 m) and lift upto 5 ft. (1.5 m	%0Cft	8,949.60	400.00	3,579.84
6/5(i)	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,746.00	38.00	8,643.48

6/6 a-II-3	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects:- :				-
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	Per Cft	354.15	225.00	79,683.75
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-			-	-
		Ratio 1:5	%Cft	23,635.60	-	-
7/5-i)	5	Pacca brick work in ground floor:-			-	
		Ratio 1:5	%Cft	25,483.60	-	-
611-c	6	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,392.85	820.00	216,421.37
21/15	7	Providing and fixing 3" (75 mm) thick R.C.C. manhole cover, 22" (550 mm) dia, with tee shaped C.I. frame of 20" (500 mm) clear i/d (frame weighing 37.324 Kg. or one maund) as per Standard Drawing STD/PD No. 5, of 1977, complete in all respects.)	Per Set	10,503.60	6.00	63,021.60

21/13	8	Providing and fixing 1¼"x1¼"x3/16" (31x31x5 mm) angle iron step, in Under ground water tank , including carriage and setting the same in work to correct lines and levels.	Each	504.40	25.00	12,610.00
					Total Amount	**383,960.04**

Construction of Water Pond (Water Body)						
Mrs Ref#	**Item No.**	**Description**	**Unit**	**Rate (PKR)**	**As Per Qty**	
					Qty	**Amount (Rs)**
3/52	1	Earthwork in excavation of drains, irrigation channels through excavator / drag lines in all kind of soil and conditions(dry,wet slush,daldal and under water) including its disposal and preparation of working pad for operation of machinery. (Rates includes 100 ft lead)	%0Cft	2,698.00	53,887.26	145,387.83
6/3-d	2	Cement concrete brick or stone ballast 1½ " to 2" (40 mm to 50 mm) gauge, in foundation and plinth:-(d) Ratio 1: 6:12	%Cft	14,289.60	2,990.74	427,365.20
6/5(f)	3	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 2: 4)	%Cft	29,211.60	4,490.61	1,311,778
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-			-	-
		Ratio 1:5	%Cft	25,285.60	10,839.77	2,740,900.57
7/5-i)	5	Pacca brick work in ground floor:-			-	
		Ratio 1:5				
11/8-b	6	Cement plaster 1:3 upto 20' (6.00 m) height:-				
		b) ½" (13 mm) thick	%Sft	2,786.40	58,793.31	1,638,216.79
					Total Amount	**6,263,647.96**

5.2.2.3. PROJECT 3 – ESTABLISHMENT OF CHAK AND FOREST PLANTATION ON 1100 ACRES IN SARGODHA REGION

SCOPE OF WORK

- Chak and forest plantation need of day to conserve fauna and flora of Sargodha division.
- Forest of Sargodha division have Economically important wild flora and fauna.
- Establishment of Chak and forest plantation promote faunal diversity.

PROPOSED AREAS

- Khushab: 200 Acres (Jauharabad Planation)
- Mianwali: 500 Acres (Kundian Plantation)
- Bhakkar: 400 Acres (Bhakkar Plantation)

COSTING

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 12: Costing for Forest Plantation

Forest Plantation						
Sr #	**Reference**	**Description**	**Unit**	**Qty**	**Rate (Rs)**	**Amount (Rs)**
1	N.s	Providing and Planting plants @6x8 Ft in the both way, including cost of plants, digging, trimming & mulching complete in all respects	Acres	1,100.00	70,000.00	77,000,000
					Total Amount	**77,000,000**

CONCEPTUAL DESIGN

- Polyculture Design

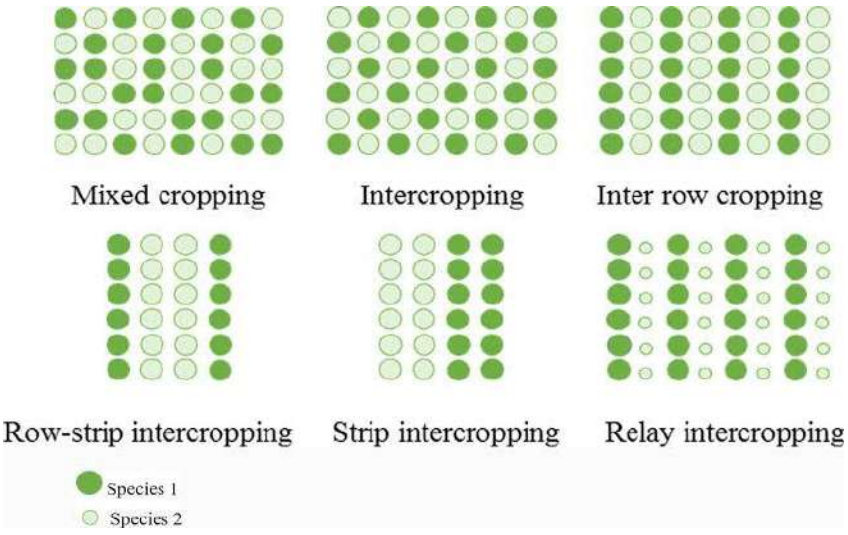


Figure 23: Conceptual Design for Forest Plantation (Polyculture Design)

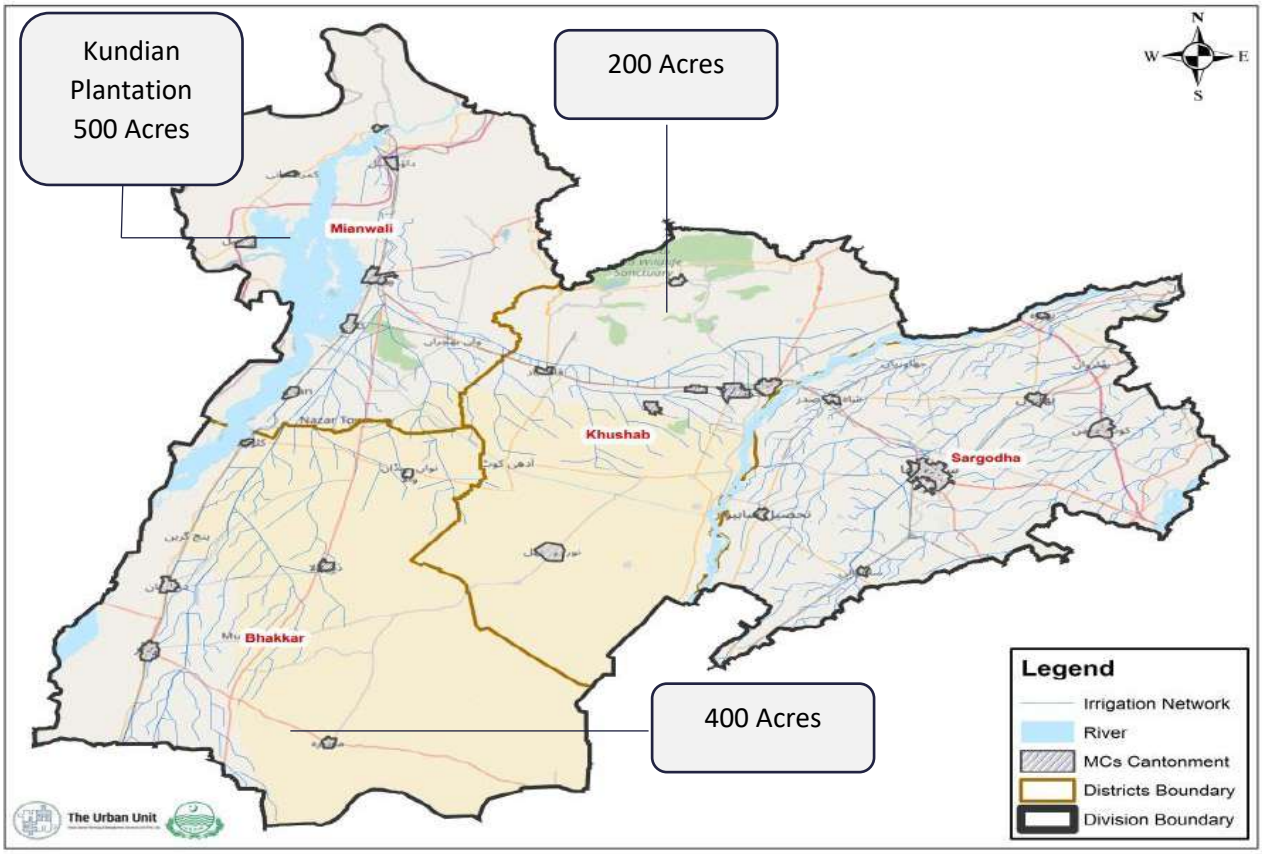


Figure 24: Proposed Areas for Forest Plantation in Sargodha Region

Morus alba

Justicia sp.

Dodonaea sp

Rhazya stricta

Jackal

Urial

Chinkara

Brown Rabbit

Figure 25: Existing Biological Diversity of Sargodha Region

5.2.2.4. PROJECT 4 – ESTABLISHMENT OF URAIL CONSERVATION AND PROTECTION CENTER IN CHUMBIL SURAL WILD LIFE SANCTUARY IN KHUSHAB

Wild Herbivores are significant economically and ecologically and to maintain their population number is a very crucial management concern. One in four species of mammals in the world is on the verge of extinction, and one in two species is declining. The IUCN lists the Punjab urial (*Ovis vignei punjabiensis*) as endangered. It is endemic to northern Punjab, Pakistan.

Chumbi Surla Wildlife Sanctuary near Khushab and Chakwal districts, was established to protect endangered Urials in 1978. This area is surrounded by many nature reserves and hills, having scrub biome (subtropical evergreen vegetation) which is ideal environment to protect and conserve Urial Species. The proposed project is to establish conservation and protection center in Chumbi Surla Wildlife sanctuary to increase and protect the population of Urials.

SCOPE OF WORK

This project primarily aims to conserve and protect the number of populations of endangered Urial species in natural habitat. Despite this promising success in protecting Urial in natural habitat, also strengthen the management activities of protected area and lower the risk of extinction by monitoring and prohibited illegal hunting..

Urial (***Ovis orientalis vignei)***
IUCN Status: VU

PROPOSED AREAS

- Khushab: 40 Acres (Chumbi Surla Wildlife Sanctuary)

ACTIVITIES

- Establishment of Enclosure of Urial Breeding Center
- Tagging of Individuals present in Wild habitat to monitor
- Watch guard Tower for wildlife watching

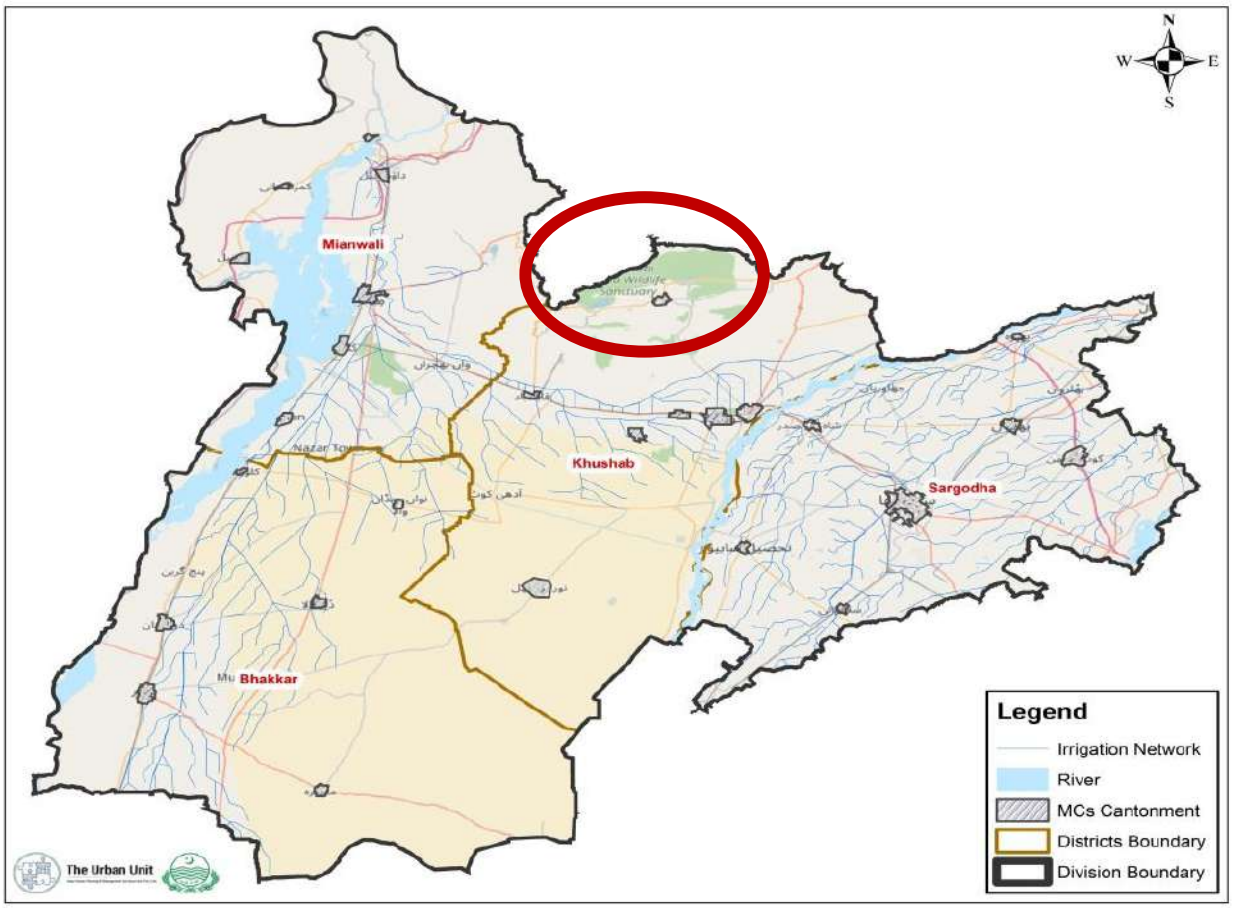


Figure 26: Proposed Habitat of Urial Conservation & Protection in Khushab

COSTING

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 11: Costing for Establishment of Urial Conservation & Protection Habitat

Enclosure for Breeding						
Sr #	**Reference**	**Description**	**Unit**	**Qty**	**Rate (Rs)**	**Amount (Rs)**
1	Ch:-3/21-a-ii	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and rammiing lead upto one chain (30 m) and lift upto 5 ft. a) By Manual ii) in ordinary soil.	%0Cft	24,606.30	8,949.60	220,217
2	Ch:-6/5-i	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate):(i) Ratio 1: 4: 8	%0Cft	24,606.30	22,803.60	5,611,122
3	Ch:-16/13-b-i	Providing and weaving G.I. wire netting for wire crates, with G.I. wire of approved size (including siding and partition to make crate):-				
		b) 6" (100 mm) mesh				
		i) 15 SWG wire	%Sft	1,574,803	3,091	48,670,868
					Total Amount	**54,502,206**

Watch Tower of Society Garud No's 04						
Reference	**Item No**	**Description**	**Unit**	**Rate (PKR)**	**As per Qty**	
					Qty	**Amount (PKR)**

Ch:-3/21-a-ii	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and rammiing lead upto one chain (30 m) and lift upto 5 ft. a) By Manual ii) in ordinary soil.	%0Cft	8,949.60	50	447.48
Ch:-6/5-i	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,746.00	6.25	1,421.63
Ch:-6/6-	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects:- :				
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	P.Cft	470.95	37.5	17,660.63
		Column Type A (nominal mix 1: 2: 4)	P.Cft	477.8	236	112,760.80
		Slab (nominal mix 1: 2: 4)	P.Cft	477.8	97.125	46,406.33
Ch:-6/11-c	4	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,399.75	926.563	244,610.18
Ch:-25/38	5	Providing and fixing M.S. angle iron 1½"x1½"x¼" (40x40x6 mm) edge protector nozing of steps of stairs, having holdfast or 3/8" (10 mm) dia M.S. bars 8" (200 mm) long welded at 2' (600 mm) centre to centre and embedded in cement concrete on steps, complete in all respects.	P.Rft	317.7	19.2	6099.84
N.s	6	solar system 1 Kw solar panel	No	175,000.00	1	175,000.00
					Total Amount	**604,406.88**
					04 x Watch Tower Total Amount	**2,417,627.51**

5.2.2.5. PROJECT 5 – ESTABLISHMENT OF ESTABLISHMENT OF TWO CHINKARA CONSERVATION & PROTECTION AREA IN KUNDIAN PLANTATION AND THAL DESERT

Chinkara primarily the inhabitant of Indian Subcontinent, South Asian region. The biggest share of Chinkara population has been found in Rajasthan India and some area of Khyber Pakhtunkhwa. A small number of Chinkara is also reported in Kala Bagh area in Salt Range, Margalla Hills in Islamabad and Cholistan Desert. Chinkara distribution is now facing severe population size decline due to over hunting which is regarded as major threat to Chinkara population, habitat depletion climatic and anthropogenic changes such as road widening projects, poaching, lack of conservation awareness, unprecedented infrastructure expansions, vehicular movement etc. Climatic and anthropogenic changes resulted the fragmentation of Chinkara population throughout the Indian subcontinent region which has raise special concerns about the protection and conservation status of Chinkara and future survival. The proposed project linked with the establishment of Enclosures for Chinkara breeding center, tag animals by keep them in captivity for monitoring and later on release in wild area of Kundian plantation and Thal desert area. Watch guard towers are also proposed in these areas for regular monitoring of Chinkara in the wild area.

SCOPE OF WORK

This project primarily aims to conserve and protect the number of populations of Chinkara and reintroduction of species in Kundian and Thal desert which is considered as natural habitat. Lower the risk of extinction of Chikara by regular monitoring in the above-mentioned areas and also probhibit the illegal hunting in these areas. This project also aims to increase the breeding of Chinkara by kept them wild habitat.

Chinkara (***Gazella bennettii)***

IUCN Status: LC

PROPOSED AREAS

- Mianwali: 40 Acres (Kundian Plantation)
- Bhakkar: 40 Acres (Desert Area)

ACTIVITIES

- Establishment of Enclosure of Chinkara Breeding Center
- Tagging of Individuals present in Wild habitat to monitor
- Watch guard Tower for wildlife watching

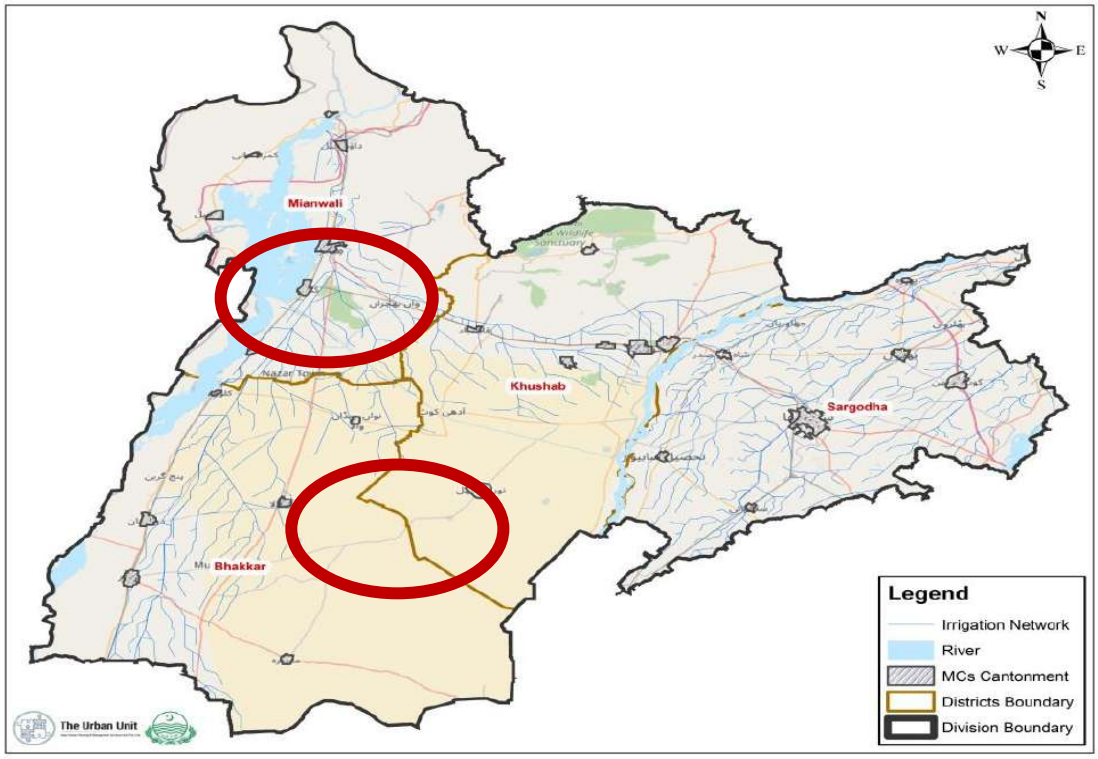


Figure 27: Proposed Habitat for Chinkara Conservation & Habitat in Mianwali and Bhakkar District

COSTING

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 12: Costing for Establishment of Chinkara Conservation & Protection Habitat:

Enclosure for Breeding						
Sr #	**Reference**	**Description**	**Unit**	**Qty**	**Rate (Rs)**	**Amount (Rs)**
1	Ch:-3/21-a-ii	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and rammiing lead upto one chain (30 m) and lift upto 5 ft. a) By Manual ii) in ordinary soil.	%0Cft	48,802.50	8,949.60	436,763

2	Ch:-6/5-i	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate):(i) Ratio 1: 4: 8	%0Cft	48,802.50	22,803.60	11,128,726
3	Ch:-16/13-b-i	Providing and weaving G.I. wire netting for wire crates, with G.I. wire of approved size (including siding and partition to make crate):-				
		b) 6" (100 mm) mesh				
		i) 15 SWG wire	%Sft	3,123,360	3,091	96,530,554
					Total Amount	**108,096,043**

Watch Tower of Society Garud No's 04						
Reference	**Item No**	**Description**	**Unit**	**Rate (PKR)**	**As per Qty**	
					Qty	**Amount (PKR)**
Ch:-3/21-a-ii	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and rammiing lead upto one chain (30 m) and lift upto 5 ft. a) By Manual ii) in ordinary soil.	%0Cft	8,949.60	50	447.48
Ch:-6/5-i	2	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate): (nominal mix 1: 4: 8)	%Cft	22,746.00	6.25	1,421.63
Ch:-6/6-	3	Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects:- :				
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	P.Cft	470.95	37.5	17,660.63

		Column Type A (nominal mix 1: 2: 4)	P.Cft	477.8	236	112,760.80
		Slab (nominal mix 1: 2: 4)	P.Cft	477.8	97.125	46,406.33
Ch:-6/11-c	4	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,399.75	926.563	244,610.18
Ch:-25/38	5	Providing and fixing M.S. angle iron 1½"x1½"x¼" (40x40x6 mm) edge protector nozing of steps of stairs, having holdfast or 3/8" (10 mm) dia M.S. bars 8" (200 mm) long welded at 2' (600 mm) centre to centre and embedded in cement concrete on steps, complete in all respects.	P.Rft	317.7	19.2	6099.84
N.s	6	solar system 1 Kw solar panel	No	175,000.00	1	175,000.00
					Total Amount	**604,406.88**
					04 x Watch Tower Total Amount	**2,417,627.51**

5.2.2.6. PROJECT 6 – ESTABLISHMENT OF WILDLIFE MUSEUM AT NAMAL LAKE

Wildlife museums and related institutions such as zoo, aquaria, botanical gardens are devoted to study and exploration of biological world. The proposed project is to establish a wildlife museum at Namal Lake, Mianwali.

SCOPE OF WORK

The aim to establish this museum is to collect specimen for research facilities, conservation and preservation of collection, documentation of specimens in museum collection, designing education program for researcher and students, planning for temporary, travelling and mobile exhibition, developing museum publication and learning resource center.

PROPOSED AREAS

- Mianwali: 03 Acres (Namal Lake)

COSTNG

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 15: Costing for Establishment of Wildlife Museum at Namal Lake:

Zoological Museum						
Reference	**Item No**	**Description**	**Unit**	**Rate (PKR)**	**As Per Qty**	
					Qty	**Amount (PKR)***
Ch:-3/21-a-ii	1	Excavation in foundation of the buildings, bridges and the other structures, including refilling around structure with excavated earth, rammiing and watering and lead up to one chain (30 m) and lift up to 5 ft. a) By Manual ii) in the ordinary soil.	%0Cft	8,727.85	1,289.38	11,253.47
Ch:-6/5-i	2	Cement concrete plain include placing, compacting, finishing and curing complete (nominal mix 1: 4: 8)	%Cft	22,746.00	6.25	1,421.63
Ch:-6/6-	3	Reinforced cement concrete in slabs of rafts / strip foundation, base slab of column and				

		retaining walls; etc and other structural members other than those mentioned in 5(a) (i) above not requiring form work (i.e. horizental shuttering) complete in all respects: - :				
		Slab of rafts / strip foundation, base slab Type C (nominal mix 1: 2: 4)	P.Cft	470.95	37.5	17,660.63
7/4-i)	4	Pacca brick work in foundation and plinth in:- Cement, sand mortar:-				
		Ratio 1:5	%Cft	23,797.80	1,353.84	322,185.03
7/7-i)	5	Pacca brick work other than building upto 10ft. (3 m) hight				
		Ratio 1:5	%Cft	23,797.80	1,353.84	322,185.03
Ch:-6/11-c	6	Fabrication of mild steel reinforcement, for cement concrete include cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		Deformed bars (Grade-60)	%Kg	26,339.05	8,098.63	2,133,102.95
Ch:-25/38	7	Providing and fixing M.S. angle Providing and laying damp proof course of cement concrete 1:2: 4(using cement, sand and shingle), including bitumen coating :- b) with 2 coats of bitumen: ii) 2" thick (50 mm)	%Sft	7,786.75	193.41	15,060.06
6/37 (a-i)	8	Providing and laying vertical damp proof course with cement sand plaster and bitumen coating:-(a) with one coat of bitumen and one coat of polythene sheet 500 gauge:	%Sft	4,201.55	386.81	16,252.12
11/9-b	9	Cement plaster 1:4 upto 20' (6.00 m) height:- ½" (13 mm) thick	%Sft	2,595.85	9,705.69	251,945.09

3/15 +18	10	Filling, watering and ramming earth under floors:- ii)with new earth excavated from outside, lead upto one chain (30 m). Dressing and levelling of earhtwork to designed section, etc Complete a)Ashes, sand, silt or soft soil.	%0Cft	4,734.70	10,801.38	51,141.27
10/3	11	Providing, laying, watering and ramming brick ballast 1½" to 2"(40 mm to 50 mm) gauge mixed with 25% sand, for floor foundation, complete in all respects.	%Cft	5,251.30	1,798.43	94,440.90
10/24-i	12	Providing andl aying superb quality Ceramic tile floors of Master brand of specified size, Glossy/Matt/Texture of approved Color and Shade as per approved design with adhesive bond, over3/4"thick(1;2) cement sand plasteri/ cthecost of seale rfor finishing the jointsi/c cutting grinding complete in all respects and asapproved and directed by the Engineer Incharge.				-
		i) 12"x18"/12"x24"/10"x24" /8"x24"/12"x36"	P.Sft	202.80	5,400.69	1,095,259.43
12/7	13	First class deodar wood wrought joinery in doors and windows etc. panelled, or panelled or glazed, or fully glazed, fixed in position, including chowkat, holdfast, hinges, tower bolts, chocks, robber stop, cleats/ G.I, clamps, handles and chord with hooks etc. complete (excluding sliding bolts or lock):- a) 2" thick (50mm)	Per Sft	2,073.25	70.00	145,127.50
25/53	14	Providing and fixing Aluminum Fly screen comprising of Fiber/ Aluminum wire guaze(Malasian) fixed in aluminu m frame of a pproved manufacturer brownze Colour/pow dercoatedofsize1-1/2"x1/2"and1.6mmthickwithrub bergasketi/ccost of Hardware sasapproved and directed by the	Per Sft	688.35	60.00	41,301.00

		engineer inch arge.complete in all respect.				
11/23	15	Distempering:-. a)new surface:- iii) three coats	%Sft	2,714.75	9,705.69	263,485.15
13/7	16	French polishing complete:-doors a)on new work	%Sft	4,280.00	140.00	5,992.00
9/5 +12 & 26/37	17	First class Single layer of brick tiles 9"x4½"x1½" (225x113x40 mm) laid over 4"(100 mm) earth and 1" (25 mm) mud plaster without Bhoosa, grouted with cement sand 1:3 on top of RCC roof slab, provided with two coats of 34 lbs. per %Sft. or 1.72 Kg/Sq.m bitumen coating sand blinded with 0.2mm thick polythene sheet. complete in all respects as per drawings and specification, including curing, etc.	%Sft	11,759.10	5,400.69	635,072.24
	19	Provision for Water Supply system i/c cost 1/2" dia i/d pipe and pipe specials water tap etc.	Job	50,000.00	1.00	50,000.00
		Internal Electrification				
Ch:-24/3	20	S/E of PVC pipe for wiring recessed in walls i/c inspection boxes hooks cutting repairing surface etc. 20 mm	P.Rft	69.4	200.00	13,880.00
		25 mm	P.Rft	80.45	100.00	8,045.00
		32 mm	P.Rft	103.6	100.00	10,360.00
Ch:-24/11	21	Supplying and erection of single core cable PVC insulated etc.				-
		3/0.029"	P.Rft	20.2	150.00	3,030.00
		7/0.029"	P.Rft	32.25	300.00	9,675.00
Ch:-24/14	22	Supply and erection of M.S. sheet box of 16 SWG, 10 cm (4") deep, with 4.75 mm thick (3/16") bakelite sheet top, for recessed wiring, including making holes for regulators, switches, plugs, etc.				-
		(8"x10")	Each	576.4	10.00	5,764.00
Ch:-24/27	23	S/F of botton holder Bracket large size.	Each	64.85	10.00	648.50
Ch:-	24	S/E of switches 5 Amp Paino type	Each	38.3	10.00	383.00

24/30						
N.s	25	S/E of celling Rose bracket.	Each	200	2.00	400.00
Ch:-24/36	26	S/E of 3 pin switch and plug combine 5 Amp	Each	75.45	5.00	377.25
Ch:-24/36	27	Supply and erection of 3 pin, 10/15 Amp. wall socket. Recessed type.	Each	101.65	5.00	508.25
N.s	28	S/E of roof hook i/c M.S.box 7"x4"	Each	120	5.00	600.00
Ch:-24/26	29	S/E of wall type / pole type bracket with double cover water tight reflector.	Each	581.5	2.00	1,163.00
N.s	30	S/E of A.C. celling fan Royal/Asia 56" sweep	Each	5500	6.00	33,000.00
Ch:-24/79	31	Supplying and fitting of regulator knob with shaft.etc.	Each	124.25	2.00	248.50
N.s	32	S/E Downlighter 1x 12W LED Light (Smaart Lights) as approved by the Electrical Engineer.	Each	200	12.00	2,400.00
N.s	33	Supply and installation of Single Phase Meter complete in all respect as approved by the Electrical Engineer.	Each	2500	1.00	2,500.00
N.s	34	S/E of Main Panel Board as shown in the Drawings.	Each	35000	1.00	35,000.00
		Incomming 30 Amp Double Pole				
		1 No Voltmeter				
		1 No Amp Meter				
		Outgoing				
		8 Nos. 10 Amp Single Pole				
		Bus Bars 1 No Phase, 1 No Netural, & 1 No. Earth				
		Thimbles				
N.s	35	Supply and installation of Walls Ac complete in all respect.	Each	81,000.00	3.00	243,000.00
		Furniture and Fixture				
N.s	36	Sofa (3 seater)	No's	45,000.00	8.00	360,000.00
N.s	38	Clock	Each	1000	1.00	1,000.00
N.s	39	Dust bins	Each	500	2.00	1,000.00
					Total Amount	**7,941,077.12**

CONCEPTUAL DESIGN

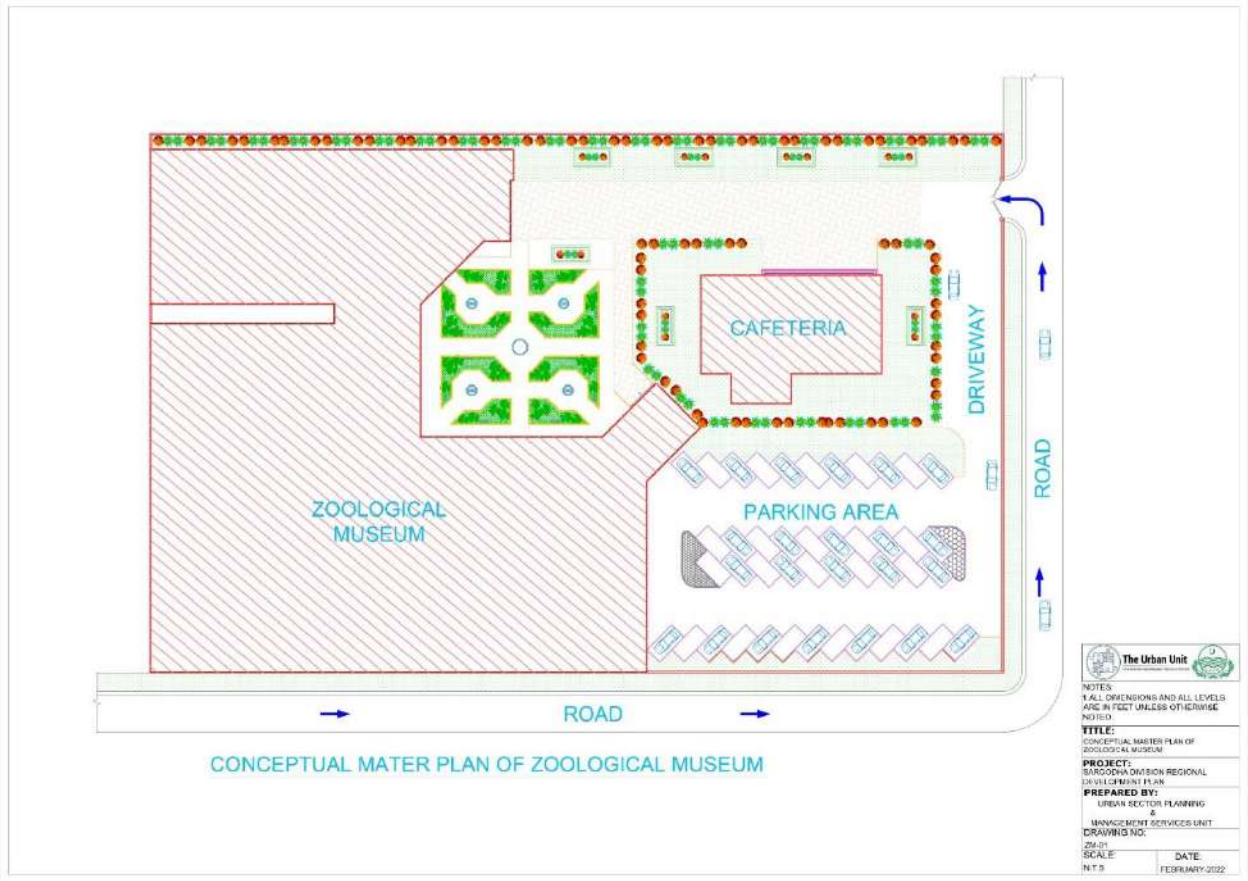


Figure 28: Conceptual Master Plan of Zoological Museum

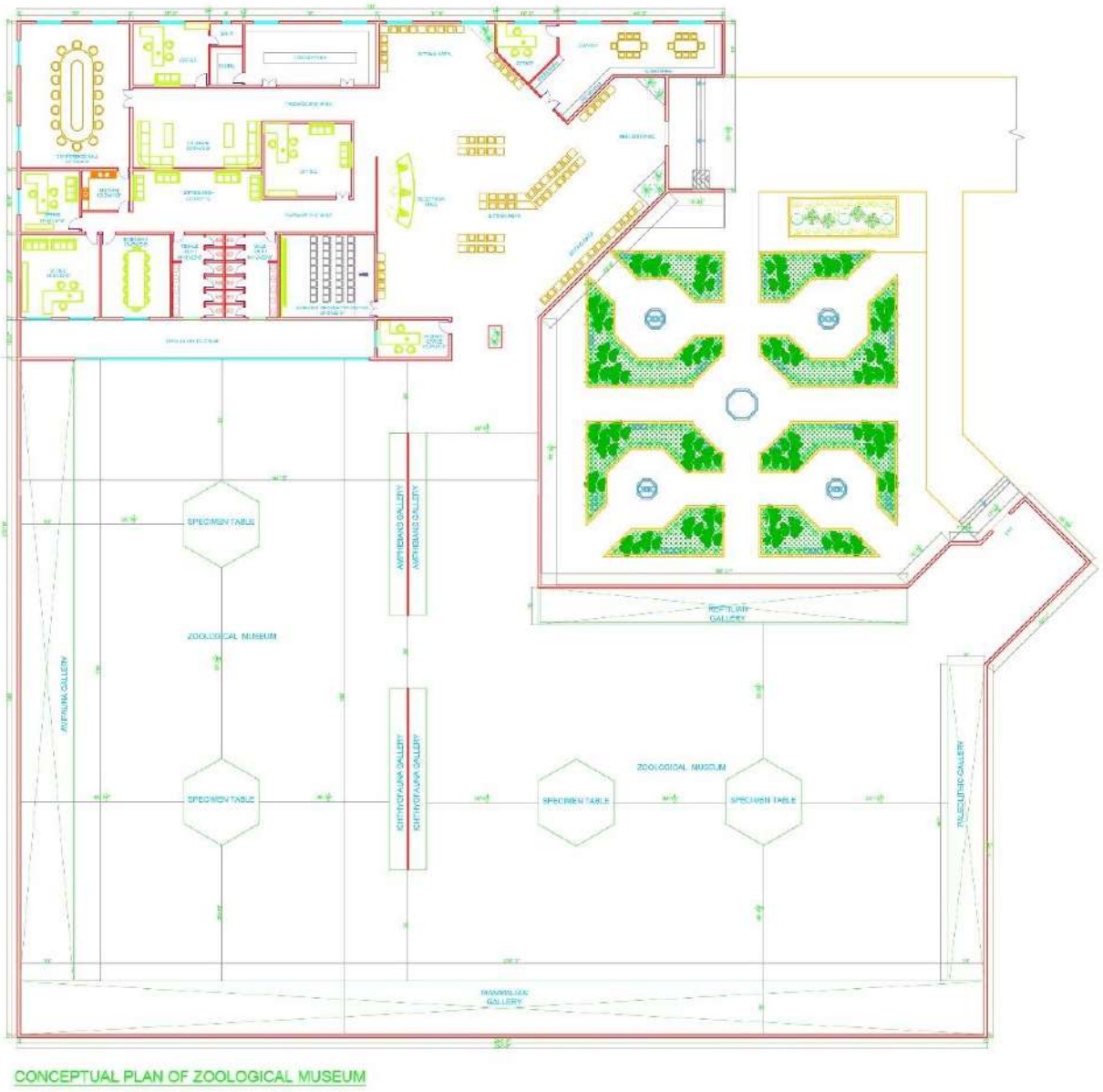


Figure 29: Conceptual Plan of Zoological Museum

5.2.2.7. BIRDS WATCHING FACILITY IN SIX ECOLOGICAL LOCATIONS OF SARGODHA REGION

Pakistan is blessed with many scenic landscapes, ecological zones, all seasons and variation in altitude ranges with rich flora and fauna. Observing birds in outdoors is a form of recreation. Inappropriately, birders, in the pursuit of interactions with the birds, can have negative effects on birds and bird habitat. In order to avoid any disturbance to these migratory and native birds, it is proposed to develop Bird watching towers at important sites in Sargodha division. six bird watching ecological locations are proposed in this project that will help visitors, tourists and researchers to study and enjoy the presence of these beautiful avifaunal species without any disturbance.

SCOPE OF WORK

Birdwatching provides an intimate connection between people and their natural environment. The birds watching tower sites can be used to primarily to record annual migratory birds. It also allows park visitors the opportunity to observe the birds along with natural resources above the ground.

PROPOSED AREAS

- Sargodha: 01 (Nabi Shah Lake)
- Khushab: O2 (Jhalar Lake, Uchhali Lake)
- Mianwali: 03 (Jinnah Barage, Namal Lake, Cheshma Lake)

CONCEPTUAL DESIGN

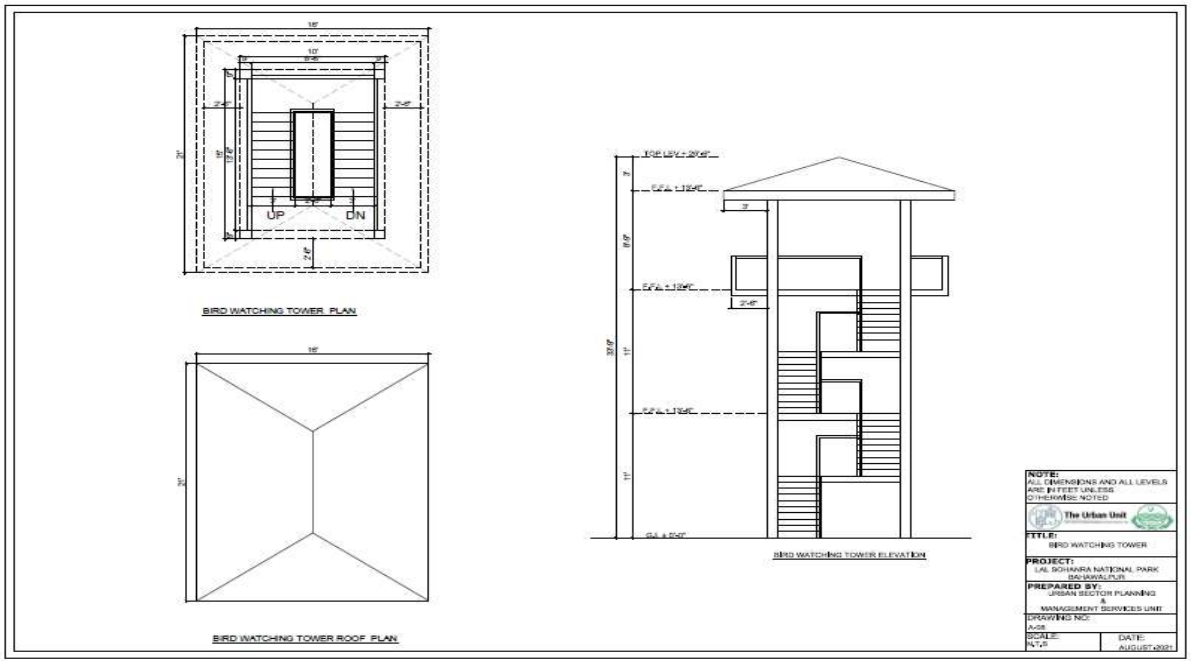


Figure 30: Conceptual Master Plan of Bird Watching Tower

Figure 31: Examples of Bird Watching Tower of Soon Valley Project

COSTING

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 16: Costing of Bird Watching Tower

Bird Watching Towers 06						
Sr #	**Reference**	**Description**	**Unit**	**Qty**	**Rate (Rs)**	**Amount (Rs)**
3/21(a-ii)	1	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling around structure with excavated earth, watering and rammiing lead upto one chain (30 m) and lift upto 5 ft. a) By Manual ii) in ordinary soil.	%0 CFT	1,750.00	8,949.60	15,661.80
Ch:-6/3-b	2	Cement concrete brick or stone ballast 1½ " to 2" (40 mm to Ratio 1: 4: 8	% CFT	1,675.00	16,917.60	283,369.80
Ch:-6/6-a-i	3	Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-Type C (nominal mix 1: 2: 4)	P.CFT	4,210.00	477.8	2,011,538.00
Ch:-6/11-c	4	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-Deformed bars (Grade-60)	% KG	10,525.00	26,378.05	2,776,289.76

Ch:-11/7-b	3	Cement plaster 1:2 upto 20' (6.00 m) height:-b) ½" (13 mm) thick	% SFT	32,092.40	3,096.00	993,580.70
Ch:-13/32A	5	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 2 COATS	% SFT	32,092.40	6,510.00	2,089,215.24
Ch:-25/39	7	Providing and fixing stair railing of 2½" (63 mm) i/d G.I. pipe, welded with 5/8"x5/8" (16x16 mm) square M.S. bars 2'-9" (838 mm) high, fixed in each step, complete in all respects, including painting, polishing three coats.	P.RFT	190.63	1,502.35	286,392.98
					Sub Total Amount	**8,456,048**
					Grand Total Amount x 06	**50,736,289.72**

5.2.2.8. PROJECT 8 – SARGODHA CANAL BEAUTIFICATION & SOLARIZATION IN URBAN AREA

Beautiful cities give their residents a sense of civic pride. The Sargodha district desire not only an improved appearance also proper sustainable functional systems in the city area. A strategic plan with long-term goals must be conceived in order to have an aesthetically sound city. Solar energy is a sustainable and environmentally friendly energy source which is the main reason for choosing solarization in urban area of Sargodha district. The proposed project is Sargodha canal beautification and solarization of urban area to make vibrant, pedestrian-friendly, sustainable and clean green city.

SCOPE OF WORK

This project proposes boating activity for tourists and visitor for entertainment and can be used as protentional site to generate economy for local people. Plantation along canal will improve aesthetics of city and make it center of attraction for visitors.

Figure 32: Current situation of Sargodha Canal

PROPOSED AREAS

- Sargodha: 05 KM (Lat: 32° 5'27.20“N Long: 72°39'20.70"E)

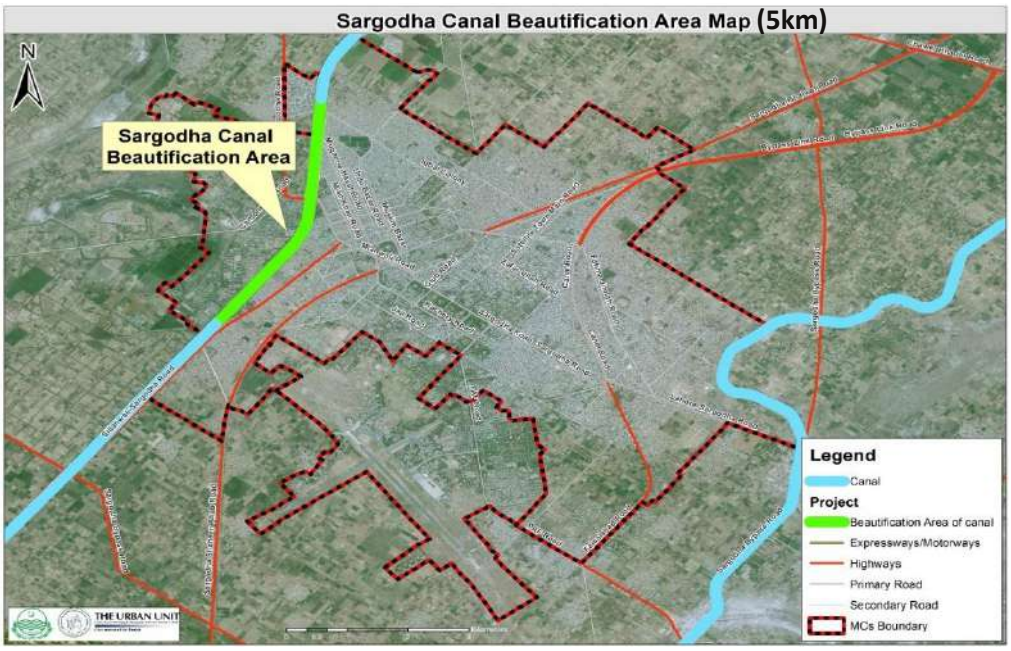


Figure 33: Sargodha Canal Beautification Area map

CONCEPTUAL DESIGN OF SARGODHA CANAL

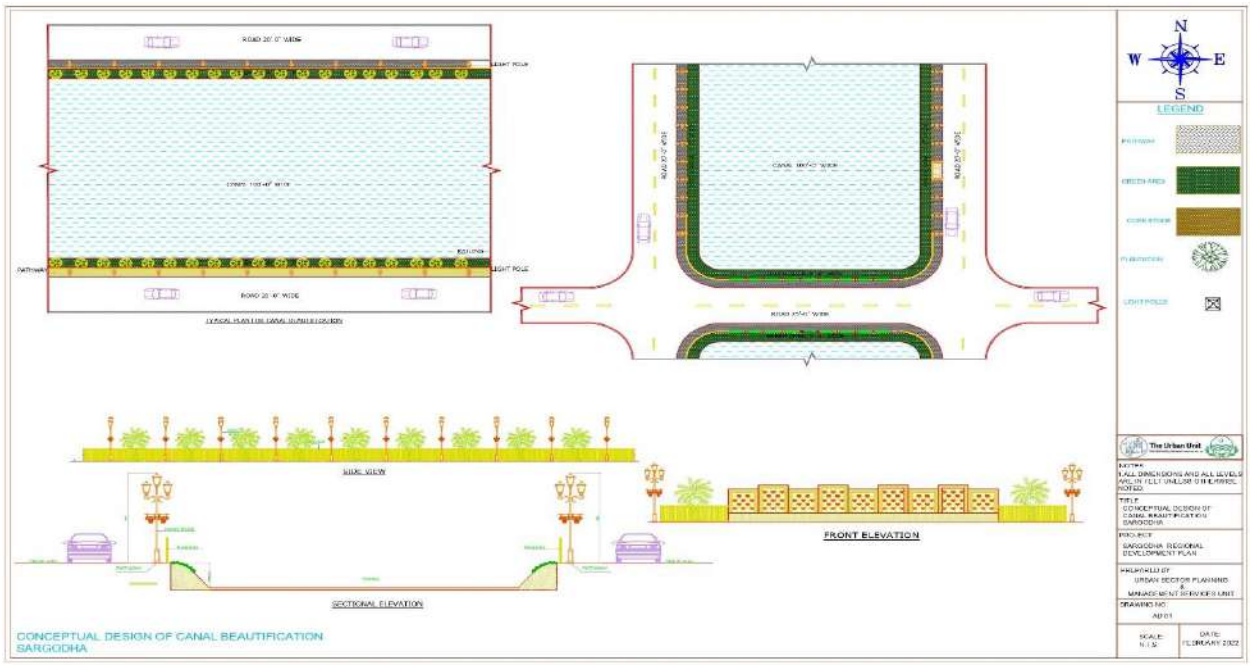


Figure 34: Conceptual Design for Beautification of Sargodha Canal

Figure 35: 3D Conceptual Design for Beautification & Solarization of Sargodha Canal

COSTING

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 17: Costing for Canal Beautification

Canal Beautification						
MRS Ref#	Item No.	Description	Unit	Rate (PKR)*	As Per Qty	
					Qty	Amount (Rs)
3/4+24b+25-I	1	Borrowpit excavation undressed lead upto 100 ft (30 metre). Compaction of earthwork with power road roller, including ploughing, mixing, moistening earth to optimum moisture content in layers, etc. complete: i)95% to 100% maximum modified AASHO dry density.	%0Cft	8,376.50	49,212.60	412,229.34
18/3-a(II)	2	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate.	% Cft	6,416.25	16,404.20	1,052,534.48
10/41-b	3	Providing and laying circular Tuff pavers,/ Stone Picth having 7000PSI, crushing strength of approved manufacturer, over 2"to3" sand cushioni/cgrouting with sand in joints i/c finishing to require slope.complete in all respect. 60-mm thick.	P.Sft	127.05	32,808.40	4,168,307.22
					Total Amount	**5,633,071.05**

Light Pole						
MRS Ref#	Item No.	Description	Unit	Rate (PKR)*	As Per Qty	
					Qty	Amount (Rs)
	1	Supply & Installation of aluminium die cast Round straight aluminum Four arm **Victorian type lighting pole 50 feet mounting heights** and approximate weight 60KG,T6 aluminum alloy with T6 temper. Circumferential satin-brushed finish. Round straight tube is uniform in cross-section down length of shaft with no taper. Anchor base: Cast from A356 aluminum alloy and heat treated to T6 temper. Base plate and shaft are circumferentially welded top and bottom, Cover and attachment hardware furnished. Hardware: Stainless steel Top cap: Removable top cap provided with drill-mount poles including 4 Nos. J Bolt, complete in all respect as per drawing approved by the consultant.	Each	81,000.00	66	5,346,000.00
	2	Supply and Installation of Victorian decorative light fixture with 40Watt LED/SMD lamp installed on above pole, complete in all respects.	Each	7,000.00	20	140,000.00
	3	Supply & Laying of following size PVC pipes and all pipe accessories make POPULAR/BETA/POLO of following sizes to be laid underground for power cables, including laying of 1:4:8 (brick ballast) general and concrete all around the pipes on road crossings, excavation and backfill including 6" layer of sand and protective bricks on above and 6" layer of sand below pipe, complete in all respects as per drawings and to the approval of the Consultant/IESCO. 2" dia (Class-"D").	Meter	379.30	430.00	163,099.00
					Total Amount	**5,649,099.00**

		Railing (Both Sides)						
MRS Ref#	Item No.	Description	Sides/ No's	Length	Unit	Rate (PKR)*	As Per Qty	
							Qty	Amount (Rs)
Ch:- 25/48	1	Providing and fixing angle iron railing, using 2½"x2½"x3/8" (63x63x10 mm) angle iron post 4½" (113 mm) long, 5' to 6' (1500 to 1800 mm) apart, with 2½"x2½"x3/8" (63x63x10 mm) angle iron top rail, and two rows of M.S. flat 2½"x¼" (63x6 mm) including fixing to side of Bridge/structure with U.bolt 1½' (450 mm) long ¾" (20 mm) dia, painting posts, etc. complete in all respects.	2	3280.84	Per Rft.	1,851.10	6,561.68	12,146,326
						Total Amount		**5,649,099.00**

Landscaping and Horticulture (Green Area and Plantation) Both Side						
MRS	Item No	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
Ch:- 3/18-b	1	Dressing and levelling of earhtwork to designed section, etc.complete:- b) Ordinary or hard soil.	%0Cft	49,212.60	550.20	27,076.77
N.s	2	Providing and laying sweet earth (canal silt) / bhul complete in all respects.	Cft	49,212.60	18.00	885,826.80
N.s	3	Providing and planting dhaka grass @2.5"c/c both way including cost of grass, dreshi, waering, & cuttings complete in all respects.	Sft	32,808.40	30.00	984,252.00

N.s	4	Providing and planting of Cananl Callistemone, Petulnia, Queen stem, Ficus Golden / Black/ White/ Jamin, IRESINE, BISMARKEA, CHANDNAI VARIGATED, Shuruh, pittosporum, conocorpus, molsri, LATANIAPALM including the cost of pitting, bhul, fertilizer, watering complete in all respect.	No's of Plants Both Side of Cannal	820.00	350.00	287,000.00
					Total Amount	**2,184,156**

Light Pole						
MRS Ref#	**Item No.**	**Description**	**Unit**	**Rate (PKR)***	**As Per Qty**	
					Qty	**Amount (Rs)**
3/4+24b+25-I	1	Borrowpit excavation undressed lead upto 100 ft (30 metre). Compaction of earthwork with power road roller, including ploughing, mixing, moistening earth to optimum moisture content in layers, etc. complete: i)95% to 100% maximum modified AASHO dry density.	%0Cft	8,376.50	49,212.60	412,229.34
6/51-b	2	Providing and fixing precast Edge Kerb Stone (4"to6"thick),of 3500PSI Compres sive Strength, embededin PCC1:2:4 over lean concrete1:4:8 etc complete in all respect.b) With Painting	Per Rft	356.25	6,561.68	2,337,598.50
					Total Amount	**2,749,827.84**

5.2.2.9. PROJECT 9 – BEAUTIFICATION OF SARGODHA RAILWAY LINES

SCOPE OF WORK

- To facilitate the walker by provision of walking pathway.
- Plantation of trees and shrub to restore ecological values.
- Provision of Benches to facilitate passengers.
- Grass landscaping

Figure 36: Current situation of Sargodha Railway Lines

PROPOSED AREA

- Sargodha: 05 KM (Lat: 34°4’49.22“N Long: 72°40’7.59"E)

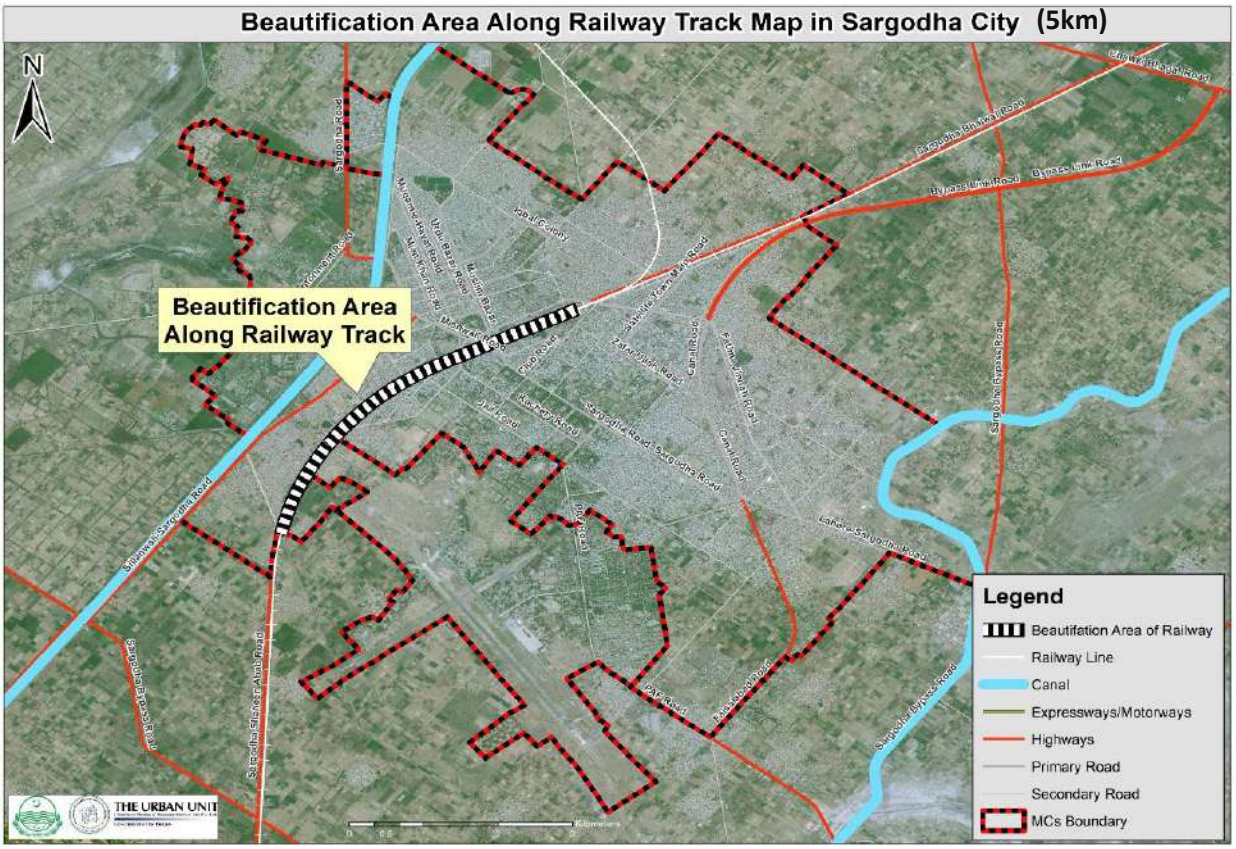


Figure 37: Proposed Area for Beautification of Railway Track in Sargodha city

CONCEPTUAL DESIGN

Figure 38: Conceptual Design for Beautification of Railway Track in Sargodha city

Figure 39: 3D – Conceptual Design for Beautification of Railway Track in Sargodha city

COSTING

MRS, 1ST BI-ANNUAL-2022 (01.01.2022 to 30.06.2022) DISTRICT SARGODHA

Table 18: Costing for Beautification of Railway Lines of Sargodha city

Railway Lines Beautification						
MRS Ref#	Item No.	Description	Unit	Rate (PKR)*	As Per Qty	
					Qty	Amount (Rs)
3/4+24b+25-I	1	Borrowpit excavation undressed lead upto 100 ft (30 metre). Compaction of earthwork with power road roller, including ploughing, mixing, moistening earth to optimum moisture content in layers, etc. complete: i)95% to 100% maximum modified AASHO dry density.	%0Cft	8,376.50	42,650.92	357,265.43
18/3-a(II)	2	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100% maximum modified AASHO dry density, including carriage of all material to site of work except gravel and aggregate.	% Cft	6,416.25	16,404.20	1,052,534.48
10/41-b	3	Providing and laying circular Tuff pavers,/ Stone Picth having 7000PSI, crushing strength of approved manufacturer, over 2"to3" sand cushioni/cgrouting with sand in joints i/c finishing to require slope.complete in all respect. 60-mm thick.	P.Sft	127.05	32,808.40	4,168,307.22
					Total Amount	**5,578,107.13**

Landscaping and Horticulture (Green Area and Plantation) Both Side						
MRS	**Item No**	**Description**	**Unit**	**Qty**	**Rate (Rs)**	**Amount (Rs)**
Ch:-3/18-b	1	Dressing and levelling of earhtwork to designed section, etc.complete:- b) Ordinary or hard soil.	%0Cft	65,616.80	550.20	36,102.36
N.s	2	Providing and laying sweet earth (canal silt) / bhul complete in all respects.	Cft	49,212.60	18.00	885,826.80
N.s	3	Providing and planting dhaka grass @2.5"c/c both way including cost of grass, dreshi, waering, & cuttings complete in all respects.	Sft	65,616.80	30.00	1,968,504.00
N.s	4	Providing and planting of Cananl Callistemone, Petulnia, Queen stem, Ficus Golden / Black/ White/ Jamin, IRESINE, BISMARKEA, CHANDNAI VARIGATED, Shuruh, pittosporum, conocorpus, molsri, LATANIAPALM including the cost of pitting, bhul, fertilizer, watering complete in all respect.	No's of Plants Both Side of Cannal	820.00	350.00	287,000.00
					Total Amount	**3,177,433**

Stone						
MRS	**Item No**	**Description**	**Unit**	**Qty**	**Rate (Rs)**	**Amount (Rs)**
6/2	1	Stone ballast, 1½" to 2"(40 mm to 50 mm) gauge.	100Cft	4,554.00	32,808.40	1,494,095
					Total Amount	**1,494,095**

5.2.2.10. PROJECT 10 – UPGRADATION OF ZOOLOGICAL MUSEUM INTO NATURAL HISTORY MUSEUM SARGODHA AT SARGODHA UNIVERSITY

Departmental Museums in Pakistani Universities are highly needed and possessing scientific importance than the general museums, as it becomes the hub for knowledge for students i.e., future generation to conduct research for their higher studies and even help them to choose their field for future career while studying in the museums of the department. With a combination of discipline-based knowledge and practical training, museums provide students critical intelligence and the ability to analyze and achieve objectives in the professional field. It is strongly recommended to upgrade the present departmental Zoological Museum at the University of Sargodha; and it must be built as a state-of-the-art Museum in order to fulfil the scientific needs of the department.

SCOPE

The Zoological Museum at Department of Zoology will be a natural history museum that exhibits a vast range of specimens from various segments of natural history.

- The museum will provide:
- An excellent research facility
- Introduction of more preserved fauna.
- General Education
- Recreation facilities
- Trainings hall and facilities.
- Publications

COSTING

25 Million PKR.

5.2.2.11. PROJECT 11 – AIR QUALITY MONITORING & MANAGEMENT PROJECT IN SARGODHA DIVISION

Air quality in Pakistan's major urban sprawls has significantly deteriorated in past few years due to industrial emissions, traffic emissions, construction activities etc. Air quality monitoring is an important factor in enabling effective monitoring decision-making on-air quality issues. One of the biggest challenges in air quality management is proper access to air quality data. The Pakistani government has started to respond to this air pollution challenge. The proposed project is to establish air quality monitoring system in major hotspots of Pollutant concentration in Sargodha division. The project has plan to establish air quality center in Sargodha district.

SCOPE

- The project aims to record air pollutant concentration ($PM_{2.5}$, PM_{10}) in each district of Sargodha Division.

- The establishment of air quality monitoring system is a critical component of public policy making to decrease toxic emission and eventually prevent population from adverse contaminant effects.

PROPOSED AREAS

District Sargodha, Khushab, Mianwali and Bhakkar

ACTIVITIES

Installation of air quality monitoring equipment (US-EPA Approved BAM 1025) and low-cost sensors in hotspot areas of Sargodha Division

Figure 40: Air Quality Monitoring Equipment (BAM)

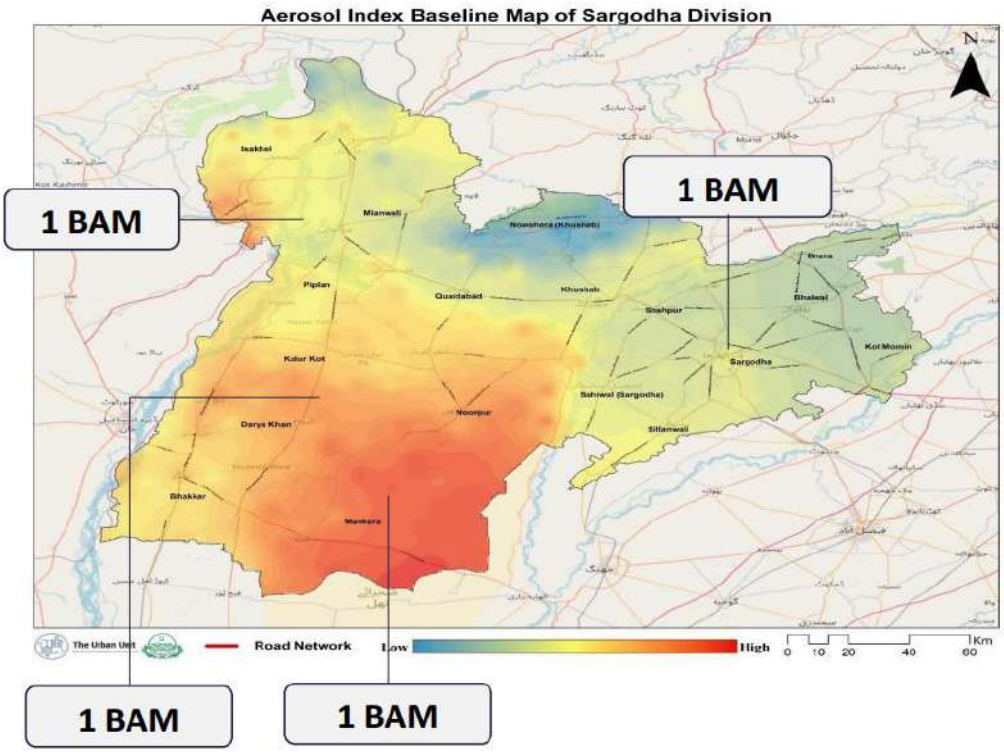


Figure 41: Installation of BAM in Sargodha District

COSTING

Table 19: Costing for Installation of Air Quality Monitoring System in Sargodha

Sr. No.	Reference	Description	Unit	Amount (M. Rs)
1.	BAM 1020	Installation of Air Quality Monitoring system	4	56.00
2.		Low-Cost Sensor	100	5
3.		Air Quality Monitoring Center		23
			Total Amount	**84**

5.2.2.12. PROJECT 12 – ESTABLISHMENT OF JOHRABAD SPORTS COMPLEX

Jauharabad was developed in 1953 under a master plan. Because of its planned design including open spaces and wide avenues. Jauharabad has many parks and children play land. But it has no develop sports complex for the people. Jouharabad is a small but planned city. It has number of parks and wide green spaces but all these parks have poor maintenance facilities. People of Jouharabad has not any separate sports complex. There is lack of sports activities in the city due to un-availability of facilities. There is need of the hour to develop a sports complex in Jouharabad similar to Mianwali and Sargodha, which will provide opportunities to both male and female athlete.

Figure 42: Condition of parks in Jouharabad

SCOPE

Master plan for 30 acres land near Johrabad station will be used for:

- Cricket Stadium, Football stadium, Kabaddi stadium, Basketball, badminton, valley ball court, Toilet block, hostel facilities, Learning center, Indoor sports complex, GYM area, Squash Complex, Mosque, Children play Land, Cafeteria, Planters, parking, light poles.

PROPOSED AREA

There is a land of 30 acre available in front of Jouharabad railway station. People from khushab, Jouharabad and Bhakar are using this land for cricket and football. There are no facilities like sitting, toilet blocks, parking, cafeteria, children play land, Learning centers and many others. Ground Conditions are in

worst condition due to poor maintenance of ground. This land can be a source of multifunctional sports activities.

Figure 43: Khushab: 30 acres land near Johrabad station (Lat: 32°17'34.23"N Long: 72°16'58.84"E)

CONCEPTUAL DESIGN

A multifunctional stadium is also proposed for Festivals and local traditional games which includes Kabaddi, Tent pegging, Horse and Cattle show, Meena Bazar and many others festivals.

A learning center is also provided along with nutritionist and physiotherapist facility. Hostel facility for male and female athletes is also provided. Separate parking area and Mosque is also proposed for the master plan. All these facilities are proposed to provide a healthy and entertaining facility to the people of Jouharabad.

Figure 44: Proposed Master Plan for Jouharabad Sports Complex

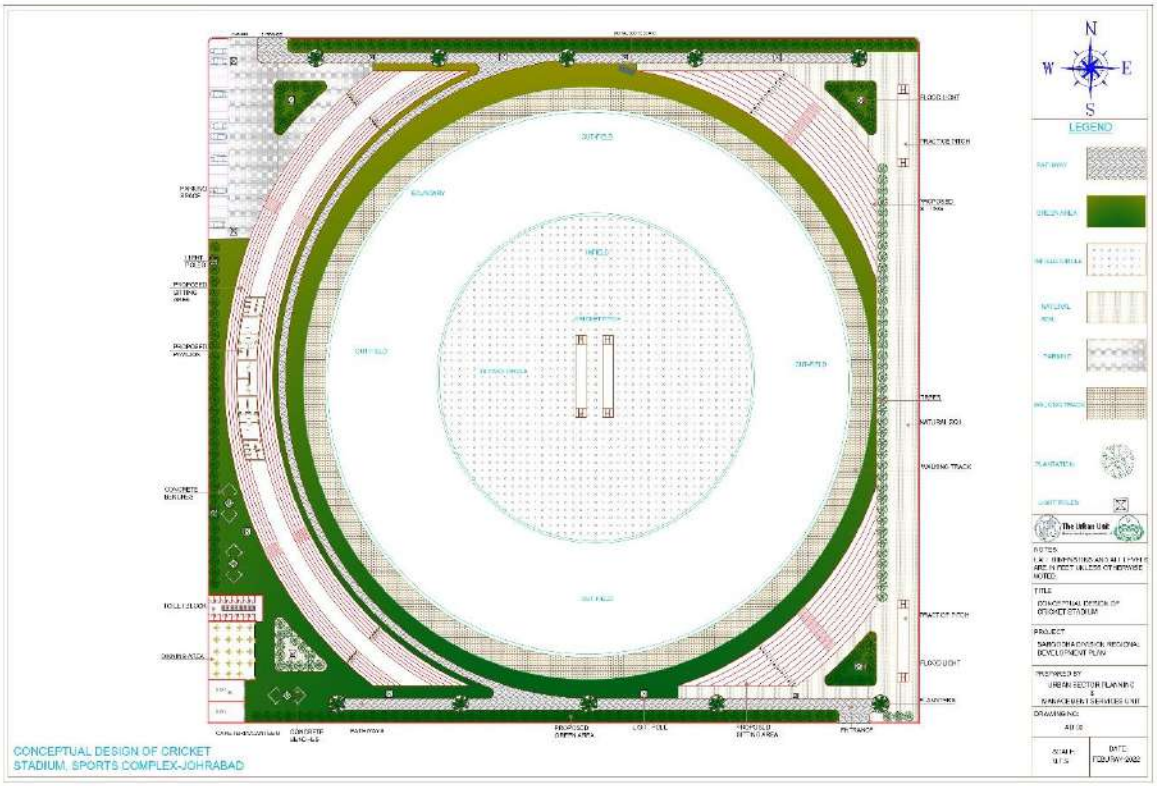


Figure 45: Proposed Cricket Stadium

Figure 46: Proposed Foot Ball Stadium

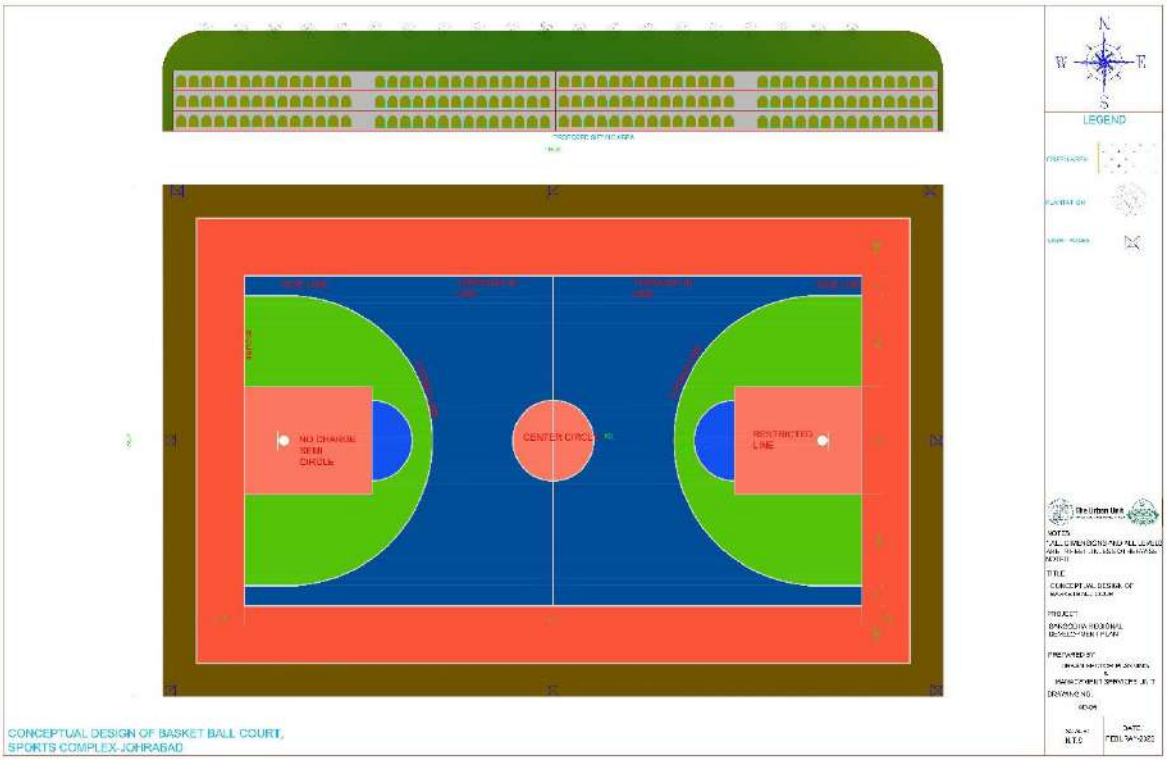


Figure 47: Proposed Basket-Ball Court

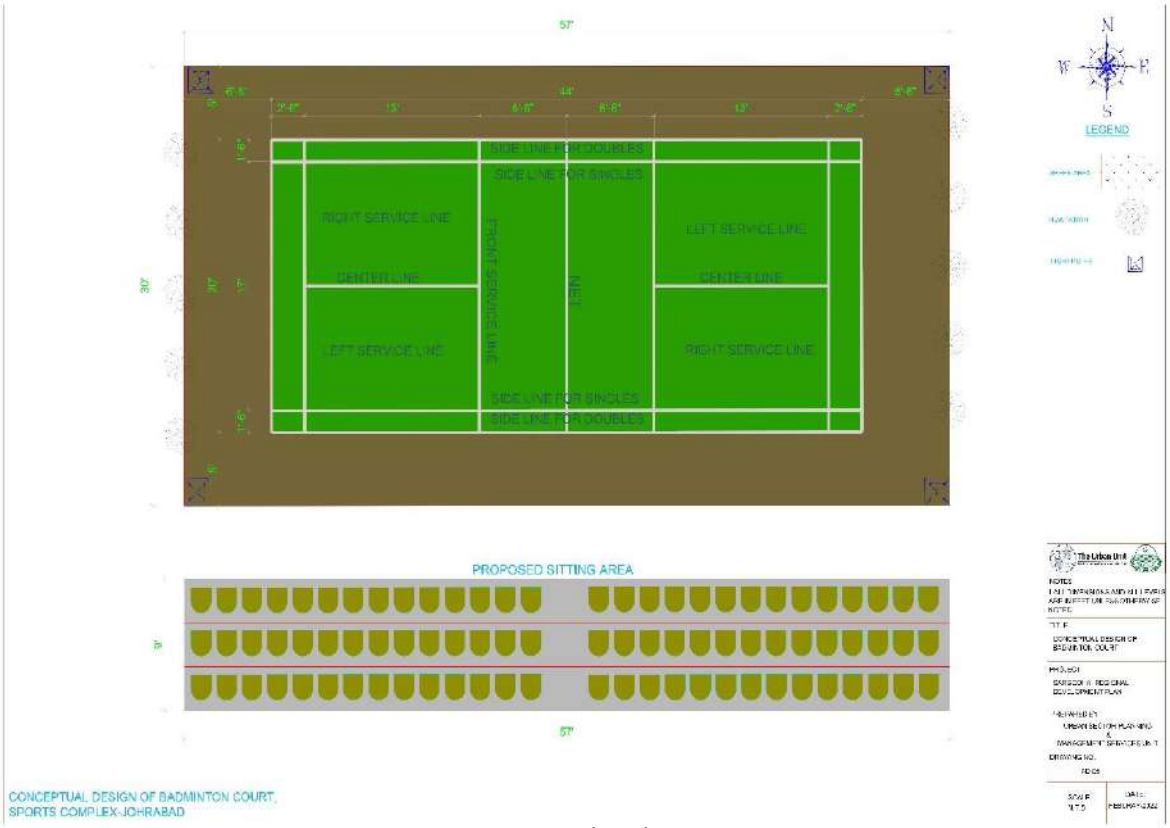
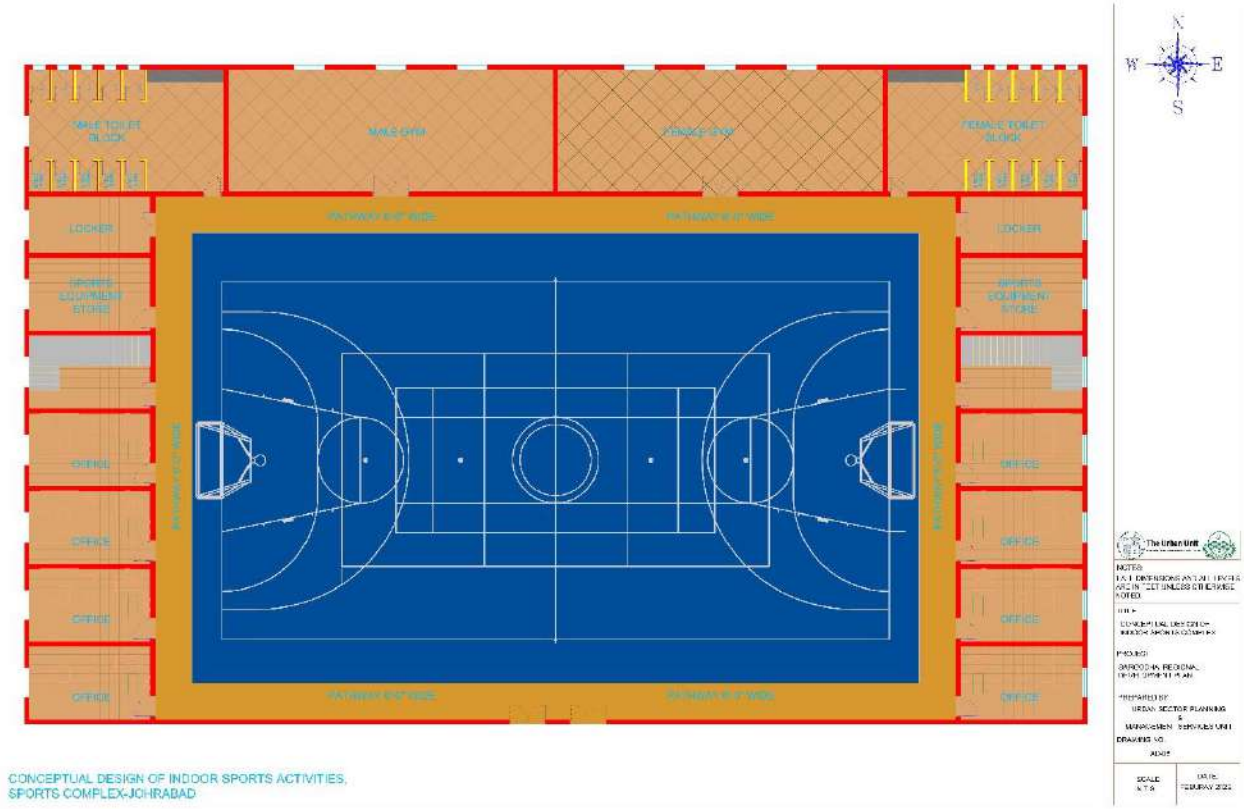


Figure 48: Proposed Badminton Court



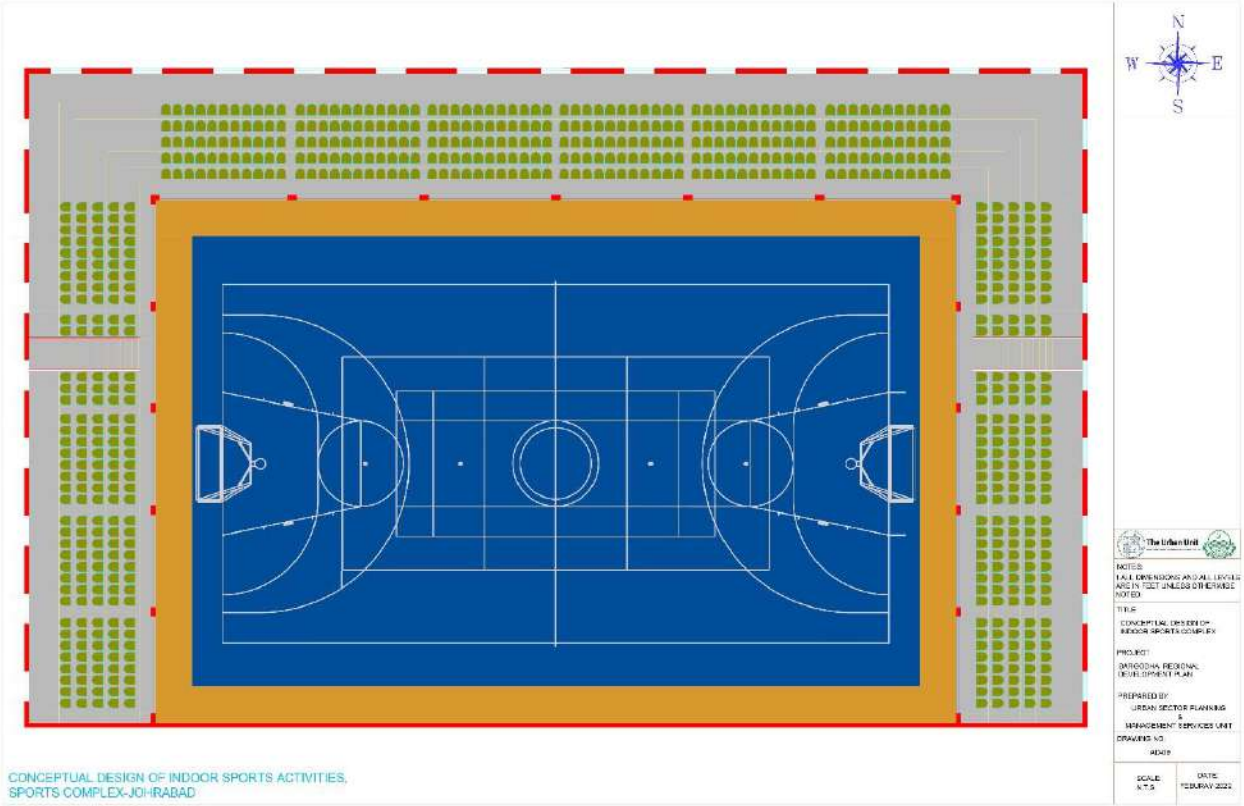


Figure 49: Proposed Indoor Sports Complex

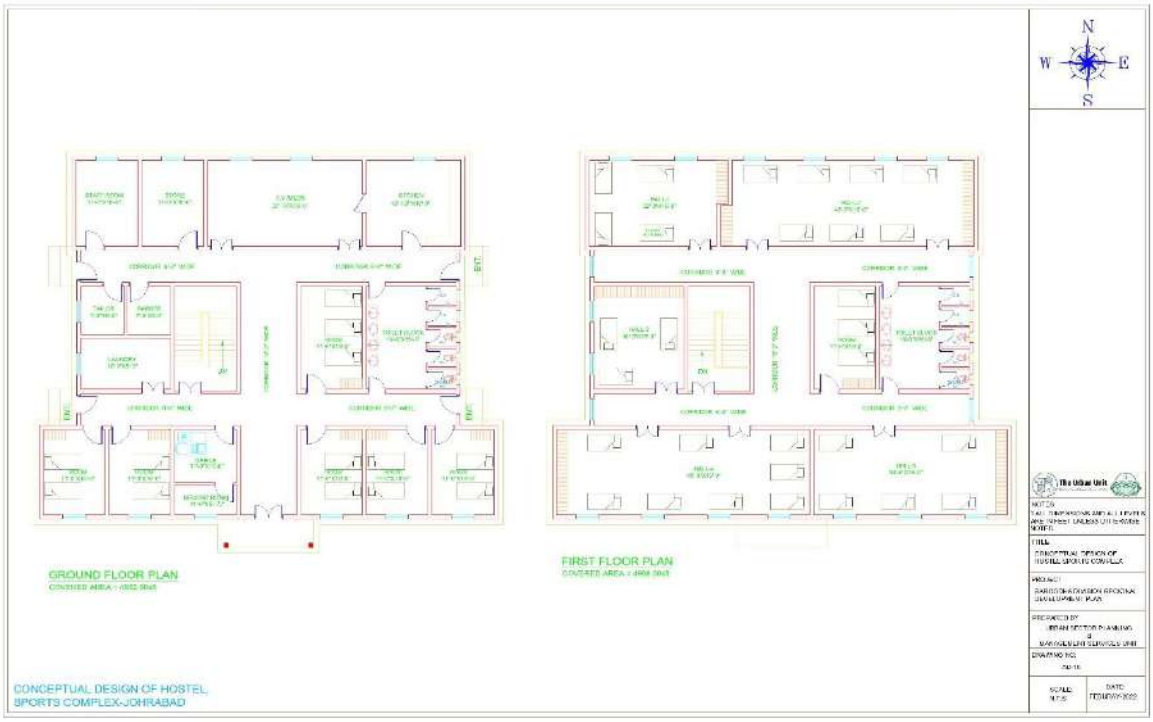


Figure 50: Proposed Hostel Facility for players

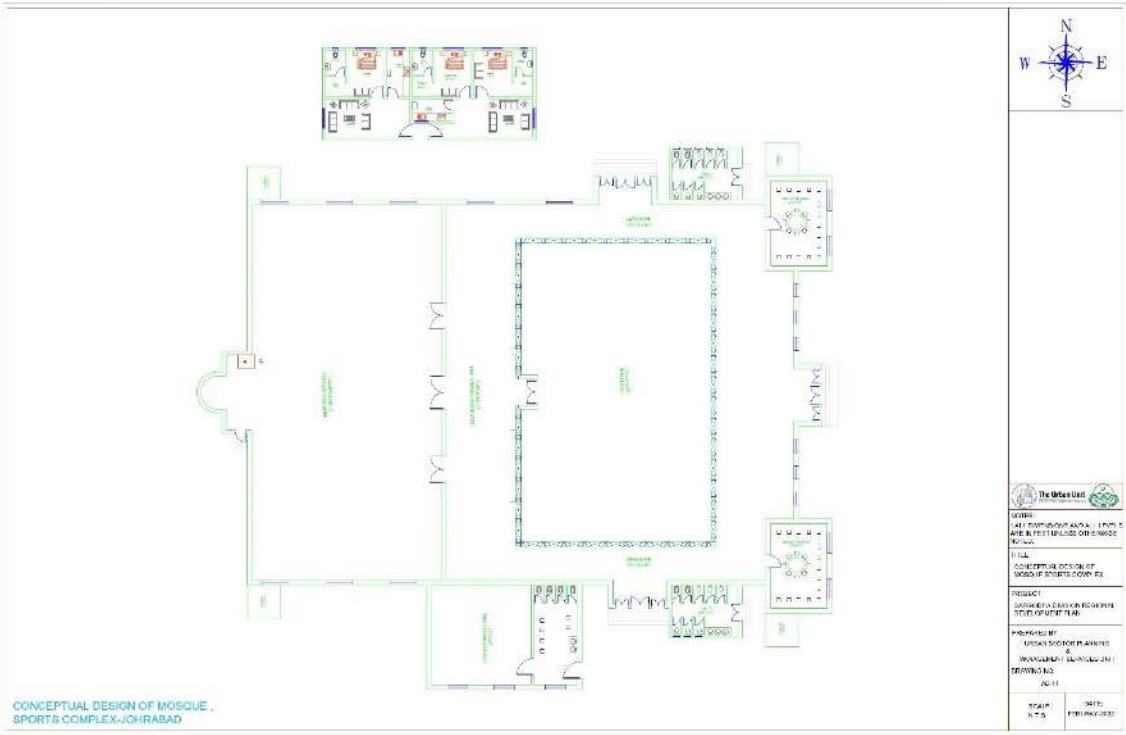


Figure 51: Proposed Mosque for Sports Complex

ROUGH COST ESTIMATION OF THE JOUHARABAD SPORTS COMPLEX

Table 20: Costing for Joharabad Sports Complex

ROUGH COST ESTIMATE FOR DEVELOPMENT OF SPORTS COMPLEX AT JAUHARABAD				
GENERAL ABSTRACT OF COST				
1	Sub Head No.1	Multipurpose Ground	Rs.17,208,228	
2	Sub Head No.2	Pavilion	Rs.8,247,840	
3	Sub Head No.3	Hostel Building	Rs.2,944,260	
4	Sub Head No.4	Volleyball Court	Rs.242,839	
5	Sub Head No.5	Badminton Court	Rs.841,214	
6	Sub Head No.6	Basketball Court	Rs.1,766,419	
7	Sub Head No.7	Children playing Area	Rs.2,638,606	
8	Sub Head No.8	Drainage System	Rs.3,258,669	
9	Sub Head No.9	Water Supply System	Rs.3,483,547	
10	Sub Head No.10	Parking Area	Rs.2,794,303	
11	Sub Head No.11	Jogging track	Rs.2,365,894	
12	Sub Head No.12	Installation of Lights at Jogging Track	Rs.2,178,607	
13	Sub Head No.13	Boundary wall and Gate	Rs.14,021,146	
14	Sub Head No.14	Outdoor Gym	Rs.1,599,520	
15	Sub Head No.15	Horticulture	Rs.1,000,000	
16	Sub Head No.16	Utility Connection	Rs.1,050,000	
17	Sub Head No.17	IT System	Rs.11,680,000	
18	Sub Head No.18	Generator 250 KVA	Rs.14,868,325	
19	Sub Head No.19	Mosque	Rs.5,000,000	
20	Hockey Stadium		Rs.55,075,410	
21	Foot Ball Stadium		Rs.55,243,731	
		Total Amount	**Rs.207,508,556**	
		Add 1% Plantation	Rs.2,075,086	
		Add 2% Contingency Charges	Rs.4,150,171	
		Add 5% PST	Rs.10,375,428	
		Total	**Rs.224,109,241**	
		Say	**Rs.224.109 Million**	

5.2.2.13. PROJECT 13 – PROTECTION AND CONSERVATION OF NABI SHAH GAME RESERVE

In Sargodha district, a game Reserve covering an area of about 1674 acres was established by Government of Punjab in Nabi Shah Lake. On February 09, 2009, this area is declared as Game Reserve for all wildlife species for a period of 05 years. This game reserve usually functional during monsoon season particularly in the month of September to January. Wide range of birds and other wildlife species visited and stayed at this place predominantly in the month of January. There are numbers of birds are the resident of Nabi Shah game reserve like Common kingfisher, Pied Bushchat, White Browed wagtail, Citrine wagtail, Great egret, Little egret, Greater Coucal, Red Lapwing and Some common stilts.

Figure 52: Biodiversity at Nabi Shah Game

KEY FINDINGS:

- Dumping Site destroying the natural habitat of Nabi Shah Game Reserve.
- Industrial waste contributing to destroying the natural habitat.
- Grazing at game reserve.
- No Boundary sign board at Game Reserve.


Figure 53: Existing Situation of Nabi Shah Game Reserve

PROPOSED PROJECTS:

- Transformation of Dumping site
- Industrial waste water diversion/Treatment
- Bird watch tower to attract tourism.

A. Transformation of Dumping Site:

The dumping site at Nabi Shah is a major cause and threat to wildlife especially avifaunal diversity of game reserve. There must be proper transformation of dumping site into vegetation site to improve the habitat for wildlife.

Scope of Work:

- The Transformation of dumping site will increase the Avifaunal diversity.
- The conservation of natural habitat will attract the wildlife as well as migratory birds.
- This will help to improve ecotourism strategy.

Activities:

- Transfer the solid waste from Nabi shah to some other place.
- Levelling of the land for plantation (Plantation Bed).
- Introduction of indigenous species at site.
- Some common indigenous species selected for the site are as follows:
    - *Acacia nilotica (Kikar)*
    - *Acacia modesta (Phulai)*

- *Ziziphus nummularia (Beri)*
- *Dalbergia sissoo (Shisham)*
- *Morus alba (Shehtoot)*

B. Industrial Waste Water management:

- The industrial waste must be discarded after proper treatment according to EPA strategy which is suitable for the aquatic life of that area.
- The EPA, Sargodha coordinates with wildlife Department and monitor it regularly to conserve the natural habitat of Nabi Shah Game Reserve.
- The proper testing of waste water must be carried out regularly at commercial scale to conserve aquatic habitat.

C. Bird Watch Tower:

Scope of Work:

- The Birdwatch tower used to monitor migratory birds visiting there annually.
- It helps to attract visitor and bird watcher to see and capture natural beauty above the ground.
- It helps to promote the ecotourism.

Conceptual Design:

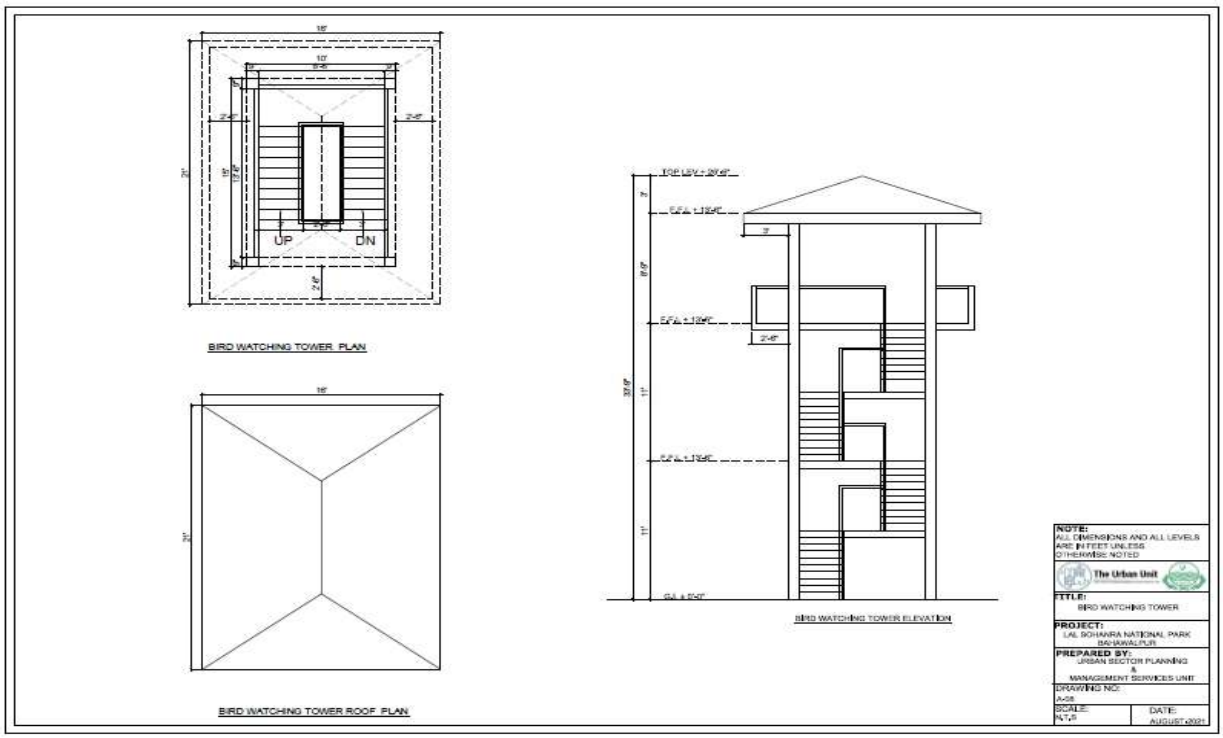


Figure 54: Conceptual Design of Bird Watching Tower

5.2.2.14. PROJECT 14 - POTENTIAL USE OF HALOPHYTES TO IMPROVE THE ENVIRONMENT AND ECOSYSTEM OF SALINE LAKES (KHABEKHI, UCHHALI, JHALAR AND NAMAL)

Salinity is one of the growing issues causing tremendous yield losses in many parts of the world especially in arid and semiarid regions. Halophytes that have capacity to accumulate and exclude the salt can be an effective way. Methods for salt removal include agronomic practices or phytoremediation. on the contrary, the phytoremediation by halophyte is more suitable as it can be executed very easily without those problems. Several halophyte species including grasses, shrubs, and trees can remove the salt from different kinds of salt-affected problematic soils through salt excluding, excreting, or accumulating by their morphological, anatomical, physiological adaptation in their organelle level and cellular level. Exploiting halophytes for reducing salinity can be good sources for meeting the basic needs of people in salt-affected areas as well.

SCOPE OF WORK

- Halophytes have the capacity to accumulate and exclude the salt to remediate salinity.
- This is cost- and labor-intensive and needs some developmental strategies for implication.
- Exploiting halophytes for reducing salinity can be good sources for meeting the basic needs of people in salt-affected areas as well.
- Halophytes can be grown in land and water containing high salt concentration, can be good source of food, fuel, fodder, fiber, essential oils, and medicine.

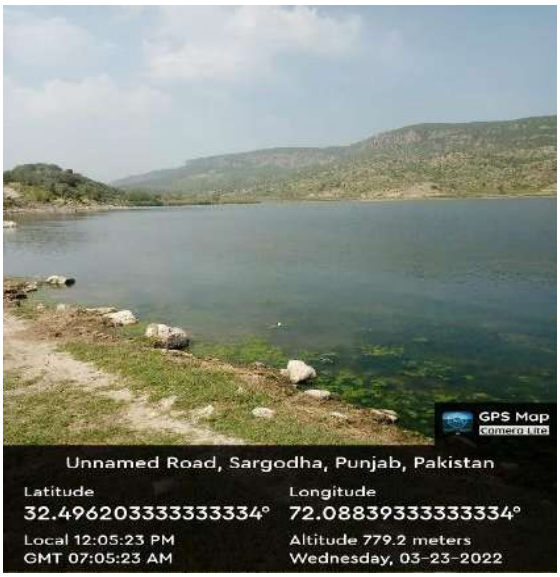


Figure 55: Proposed Location for Halophytes Growth

PROPOSED AREAS

Khabeki, Uchali, Jhalar and Namal Lakes

AFFORESTATION IN THE KATCHA AREA OF MIANWALI TO CONSERVE BIODIVERSITY

Forestry is multifunctional by nature, but has traditionally been a sector of the economy whose primary objective is to maximize profits from timber production. It is being increasingly recognized that, in addition to timber production, woodlands contribute to global carbon budgeting, provide biodiversity and aesthetic values, and serve as the basis for developing local entrepreneurial opportunities, tourism, recreation, and rural livelihoods. In order to be viable afforestation projects, need to be coherent, effective, cost efficient, widely acceptable by the public and consistent with other aspects of sustainable development policy.

PROPOSED AREAS

Katcha area of Mianwali district along the Indus river banks

SCOPE OF WORK

- Carbon sequestration programs, including afforestation and reforestation, are gaining attention globally and will alter many ecosystem processes, including water yield
- Forestation is referred to as the activity of planting trees in empty areas to rehabilitate, rebuild, or create forests
- Forests provide a multitude of products and services, also known as ecosystem services
- Water yield is altered through changes in transpiration, interception, and evaporation, all of which tend to increase when grasslands or shrublands are replaced with trees.

ACTIVITIES:

- Introduction of indigenous species at site.
- Some common indigenous species selected for the site are as follows:
    - *Acacia nilotica (Kikar)*
    - *Acacia modesta (Phulai)*
    - *Ziziphus nummularia (Beri)*
    - *Dalbergia sissoo (Shisham)*
    - *Ficus religiosa (Peepal)*
    - *Ficus benghalensis (Banyan)*

Chidru Public Wildlife Reserve

The Chidru area is newly notified on 07th February, 2022 as Chidru Public Wildlife Reserve in Mianwali. Where the Urial population size is 50-60 individuals seen by the department and stakeholders. The common wildlife of the area is Porcupine, Skink, Common Lizards and Urial. The dominant plant species of the area is *Prosopis juliflora, P. cineraria, Acacia nilotica, A. modesta, Conyza sp. Rhazya stricta* and some common bushes and grasses are growing there.

Park Management Plant:

The Chidru Public Wildlife Reserve need special concern to conserve the Urial population at natural habitat. To plan the strategy of the area there must be a management plan to restore the natural habitat and conserve the population.

Key Feature of Management Plan:

- Conservation strategy
- Inventory of Fauna and Flora
- Restoration plan of natural Habitat
- Breeding center management plan
- Indication of Urial Habitat
- Establishment of Zone to reduce Hunting

Figure 56: Clicks of Chidru public Wildlife Reserve

GOVERNMENT OF THE PUNJAB
FORESTRY, WILDLIFE & FISHERIES
DEPARTMENT

Dated: 07.02.2022

NOTIFICATION

No. SOP(WL)12-1/2019(A):- In exercise of the powers conferred in Section 12 of "The Punjab Protected Areas Act 2020", Secretary to Government of the Punjab, Forestry, Wildlife & Fisheries Department is pleased to declare the area specified in the schedule given below to be a Public Wildlife Reserve for all the wildlife species till further orders. Whereas, the hunting of wild animals "specified in the 1st schedule" of "The Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974, shall be regulated in pursuance of the Punjab Protected Areas Act, 2020 and rules made under the Acts ibid..

SCHEDULE.

Name	Area in Km	Tehsil	District
Chidru Public Wildlife Reserve	16 Km^2	Mianwali	Mianwali

BOUNDARY.

East: Lalumi, Kari Wali, Maharanwala.
West: Wadi Sam, Moza Bazar
North: Churi Hasar, Tremo nala
South: Biruli, Derajat Mauza Chidru

(SHAHID ZAMAN)
SECRETARY, F W & F DEPARTMENT

NO. & DATE EVEN.

Copy is forwarded to:

1- The Director General Wildlife & Parks, Punjab Lahore with reference to letter No.4243/DG(W&P)Mgt-2(1)PA/2022 dated 02.02.2022.
2- The Deputy Commissioner, Mianwali.
3- The District Police Officer, Mianwali.
4- The Conservator of Wildlife, Ministry of Climate Change, Government of Pakistan, Islamabad.
5- The Superintendent, Government Printing Press, Punjab Lahore for publication in the next issue of the Punjab Government Gazette and supply of twenty printed copies of Notification.

(MUHAMMAD FAREED GHAURI)
SECTION OFFICER (WILDLIFE)

C.C
PS to the Secretary, FW&F Department.

Figure 57: Notification for Declaration of Chidru public Wildlife Reserve

The Urban Unit

TheUrbanUnit urbanunitGop urban_unit urban-unit

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