Climate Change Risk Vulnerability and Adaptation Assessment Report

June 2016
Project Number 47024-004

Islamic Republic of Pakistan: Pehur High Level Canal Extension Project

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LIST OF ABBREVIATION

ADB	Asian Development Bank
AOGCM	Atmospheric Ocean General Circulation Models
AMSL	Average Mean Sea Level
AR4, 5	Climate Change Scenarios
CSIRO	Commonwealth Scientific Industrial and Research Organization
GCMs	Global Circulation Models
GEV	Generalized Extreme Value
GHG	Greenhouse Gas
GFDRR	Reducing Vulnerability to Natural Hazards
IPCC	Intergovernmental Panel on Climate Change
KPK	Khyber Pakthunkhwa
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
O&M	Operations and Maintenance
PMD	Pakistan Meteorological Department
PHLCEP	Pehur High Level Canal Extension Project
PHLC	Pehur High Level Canal
PPM	Parts Per Million
RCPs	Representative Concentration Pathways
SimCLIM	Climate Change Simulation Model
SRES	Special Report on Emissions Scenarios
SWH	Surface Water Hydrology
UNEP	United Nations Environment Programme
WAPDA	Water and Power Development Authority
WMO	World Meteorological Organization

Climate Change Risk and Vulnerability Assessment

1. INTRODUCTION

1. Climate Change is a natural phenomenon that has happened on earth throughout its existence. During ancient times the climate has been warmer as well as cooler as compared to today. Climate change is happening on a global scale with locally varying magnitude and is driven by physical processes. During the last century, for which detailed climate observations are available, an increasing trend has been recorded, indicating that we are in a warming phase. Next to natural drivers the warming is driven by anthropogenic activities, mainly the combustion of fossil fuels and respective release of "greenhouse" gases into the atmosphere. The "greenhouse" gases are promoting atmospheric warming by reducing thermal losses into space.

2. Most visible impacts of climate change are increasing variability in rainfall leading to more extreme events - floods and droughts, as well as increasing temperatures with respective impacts on evapotranspiration and respective agricultural impacts as well as impacts on snow and ice covers resulting in glacier melt, changes in the snow line and respective freshwater availability changes in space and time in many regions. Figure 1-1 gives a comparison of annual mean temperature change in Pakistan as calculated by the Pakistan Meteorological Department, with global temperature variations from Year 1860 to Year 2000.

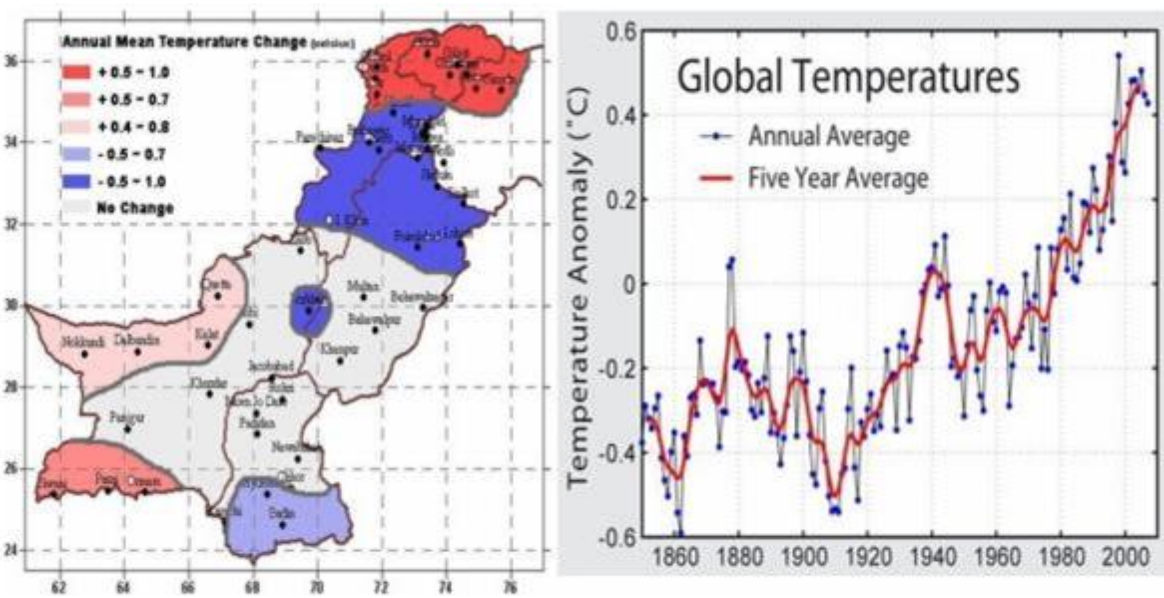


Figure 1-1: Comparison of Annual Mean Temperature Change in Pakistan with Global Temperature Variations from 1860 to 2000

3. Climate change may have impact on a project especially if the project is located in a water scarce area. The likely climate change impacts in the project area are increased temperatures with reduced water availability and occasional heavy floods from high rainfall. Any increase or reduction in water availability can affect the overall economics of the project.

4. Agriculture projects are both vulnerable to climate shifts and are also a source of the greenhouse gases driving changes. Climate change related threats to agriculture represent threats to society, and calls for adaptation and mitigation strategies are increasing. Adjustment

to potential natural hazards depends on perceptions of the risks evaluation of climate change is important so that correct and more representative estimates of input parameters for the crop water requirement are made. These parameters are temperature (maximum and minimum) and precipitation.

1.1 Definitions of Terms Related To Climate Change

5. Definitions of common terms used in Climate Change assessment is given below:

Weather: The state of the atmosphere at a given time and place, with respect to the variables such as temperature, moisture, pressure etc.

Climate: Average weather. Statistical description of mean weather conditions over a period of several years, typically 2-3 decades.

Climate Change: The most general definition of climate change is a change in the statistical properties of the climate system when considered over long periods of time, regardless of cause. Accordingly, fluctuations over periods shorter than a few decades, such as El Niño, do not represent climate change. The term sometimes is used to refer specifically to climate change caused by human activity, as opposed to changes in climate that may have resulted as part of Earth's natural processes. In this sense, especially in the context of environmental policy, the term climate change has become synonymous with anthropogenic global warming. Within scientific journals, global warming refers to surface temperature increases while climate change includes global warming and everything else that increasing greenhouse gas levels will affect. On the broader scale, the rate at which energy is received from the sun and the rate at which it is lost to space determine the equilibrium temperature and climate of earth. This energy is distributed around the globe by winds, ocean currents, and other mechanisms to affect the climates of different regions. The greenhouse effect: plays a crucial role in maintaining a life-sustaining environment on the earth. If there was no greenhouse effect, the average temperature of the earth would have been -180^{0}C (253°K) instead of the present 15^{0}C. Human activity is enhancing the natural greenhouse effect by adding gases like carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, ozone, etc. It is this enhanced greenhouse effect which is causing global warming and climate change.

Intergovernmental Panel on Climate Change (IPCC): As an intergovernmental body jointly established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), the Intergovernmental Panel on Climate Change (IPCC) has provided policymakers with the most authoritative and objective scientific and technical assessments. Beginning in 1990, this series of IPCC assessment reports, special reports, technical papers, methodology reports and other products have become standard works of reference

Global Circulation Model (GCM): Global Circulation Models (GCMs) are complex, three-dimensional climate models that consider a range of factors with potential to influence our global climate system. They are also referred to as Global Climate Models.

1.2 Climate Change Studies for Pehur High Level Canal Extension Project (PHLCEP)

6. Changes in the climate can have significant impact on infrastructure viability and operation, as well as on the surrounding communities. For PHLCEP, impacts of climate change on

temperature, precipitation, and storm frequency and intensity has been analyzed as discussed in this report.

1.3 Climate Change in PHLCE as Per Historical Record

7. This Appendix presents a review of climate and the historical data required to establish a baseline to assess the impact of climate change on the precipitation and temperature of the region.

1.3.1 Geographic background of the project

8. Pehur High Level Canal Extension Project (PHLCEP) falls within the district of Swabi of KP Province, and about 4 % at the tail end extends to the district of Nowshehra. The whole area is spread in the form of two major chunks i.e. Janda Boka and Indus-Ambar. The proposed Janda Boka area lies near the Gandaf Tunnel outlet from Tarbela reservoir towards the right of PHLC, while the Ambar area start about 5 km to the west of Swabi town, and is spread on the left side of Maira Branch. Similarly, the Indus area adjoins the Ambar area towards the west and extends on the left side till the end reaches of Maira Branch. The location of the project is shown in Figure 1-2.

1.3.2 Climate and bio-climate of the study area

9. This region's climate is classed at lower elevations as humid subtropical. Annual average rainfall varies from around 500 mm to about 1,750 mm. The climate at higher elevations is classified as humid continental. The temperatures in this region are moderately hot. Significantly higher humidity during the monsoon causes heat discomfort greater than the same in the northern region. Temperatures in summer are quite hot, around Mardan temperatures of 45°C are not uncommon, whilst in Peshawar 40°C is recorded in summer. In winter, however, this region is both warmer and generally drier than the rest of Khyber Pakhtunkhwa, with temperatures being around 17°C in Peshawar. Nights, however, can still be quite cold during the winter.

10. Figure 1-3 represents the mean values of different climate parameters for different months at Peshawar city[1].

[1] http://www.climate-charts.com/Locations/p/PK41530.php

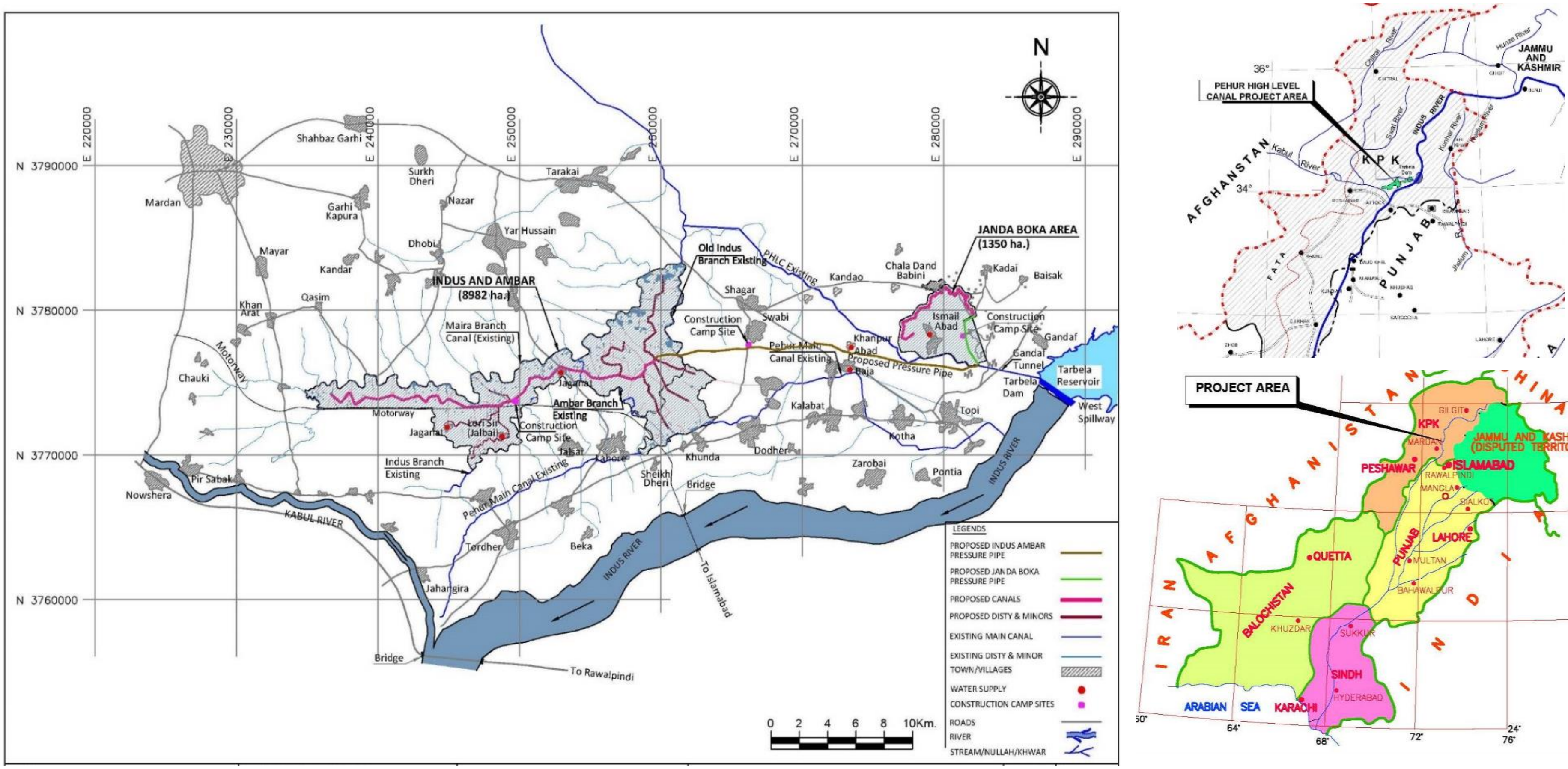


Figure 1-2: Project area map

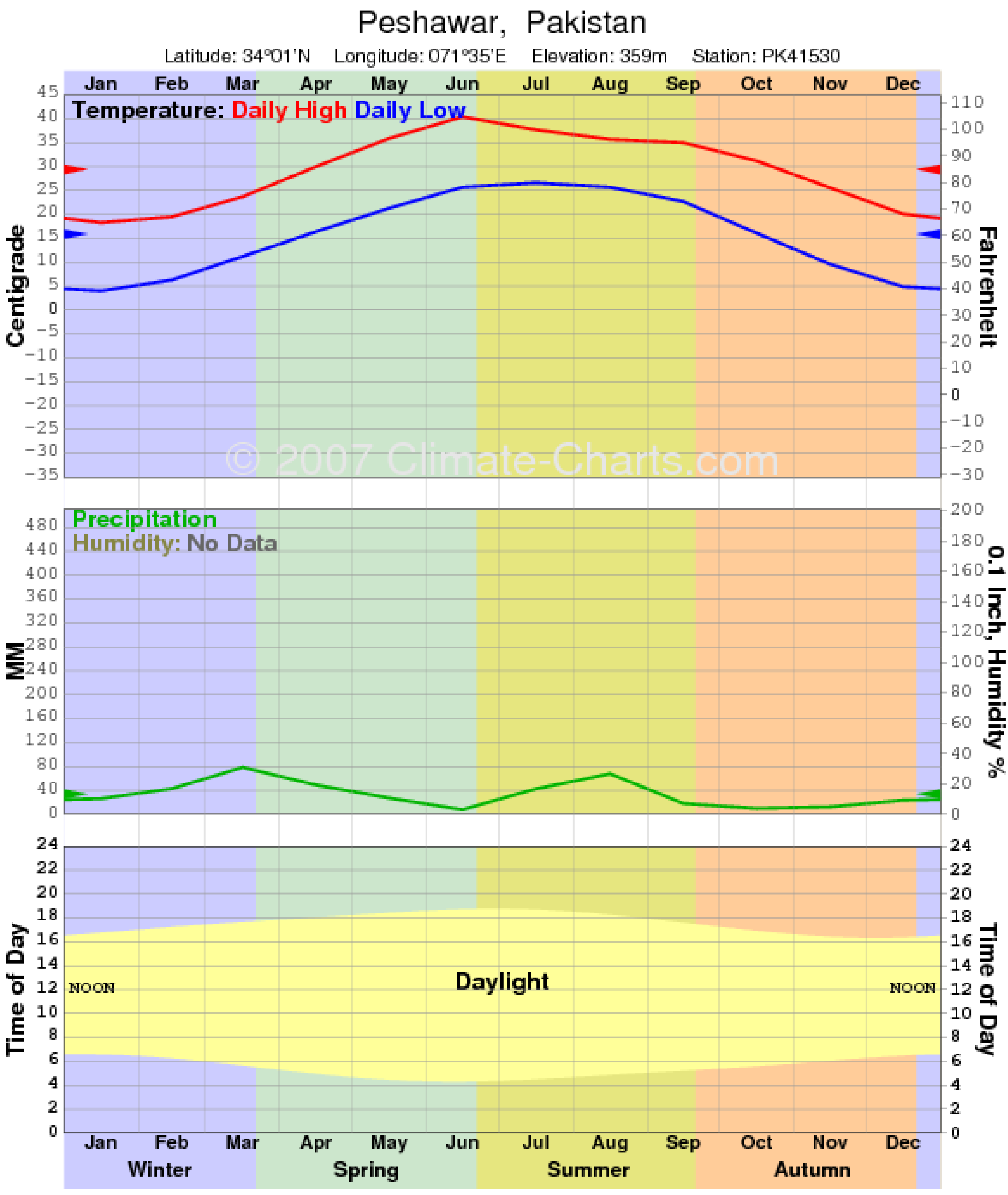


Figure 1-3: NOAA Peshawar Data, Presented in both Metric and English Units

1.3.2.1 Historic Precipitation and Temperature data

a.) Precipitation

11. The rainfall data has been recorded at Kakul, Murree, Kamra and Risalpur by Pakistan Meteorological Department (PMD) and Tarbela, Phulra and Oghi by Surface Water Hydrology (SWH), WAPDA. The description of rainfall stations is given in Table 2-1 and locations of rainfall stations are shown in Figure 1-4.

Table 1-1: Rainfall gauges in the study area

Rainfall Station	Elevation (m amsl)	Source	Annual Rainfall (mm)
Kakul	1,310.9	PMD	1,329
Phulra	914.7	SWHP	1,045.5
Oghi	1,127.8	SWHP	1,151.6
Tarbela	609.6	SWHP	918
Murree	2,125.7	PMD	1,500.1
Kamra	303.30	PMD	1030.60
Risalpur	315.00	PMD	697.80

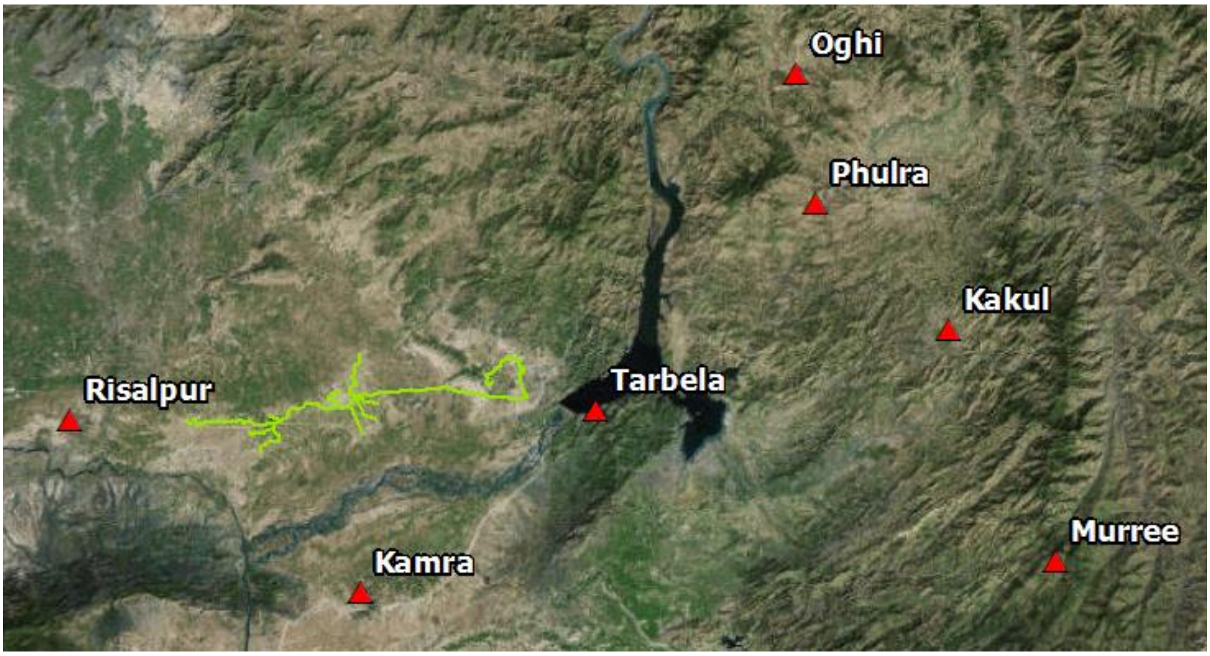


Figure 1-4: Location of Gauging Station around Project Area

12. As Kamra and Risalpur being the closest to the project area, the average rainfall from these stations are used for the rainfall analysis, moreover elevation difference of these stations and PHLCE is not too much as compared to other stations, and therefore it is used for the analysis. Mean monthly Precipitation records of Kamra was available from 1997 to

2010 and Risalpur data was available from 1981 to 2010, mean monthly average of these stations are presented in Figure 1-4.

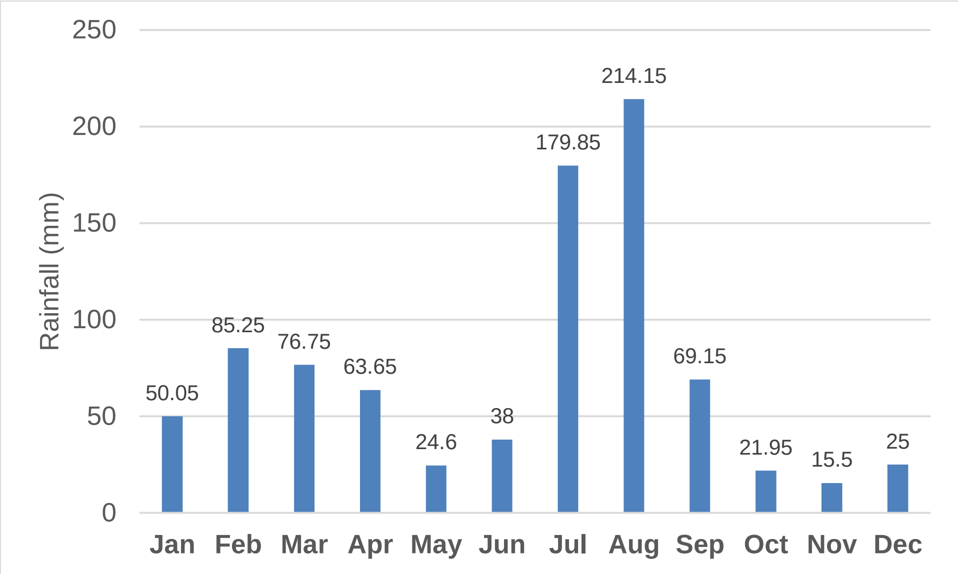


Figure 1-4: Mean Monthly Precipitation for Kamra and Risalpur

b.) Temperature

13. Monthly Temperature (maximum and minimum) at Kamara and Risalpur have been collected from 1997 to 2010 for Kamara and 1981 to 2010 for Risalpur . As these stations are most closest to the project area and elevation of these stations with PHLCE is also comparable, therefore average temperature of these two stations were used for the analysis. Mean monthly (maximum and minimum) temperatures for Kamara and Risalpur are shown in Figure 1-5.

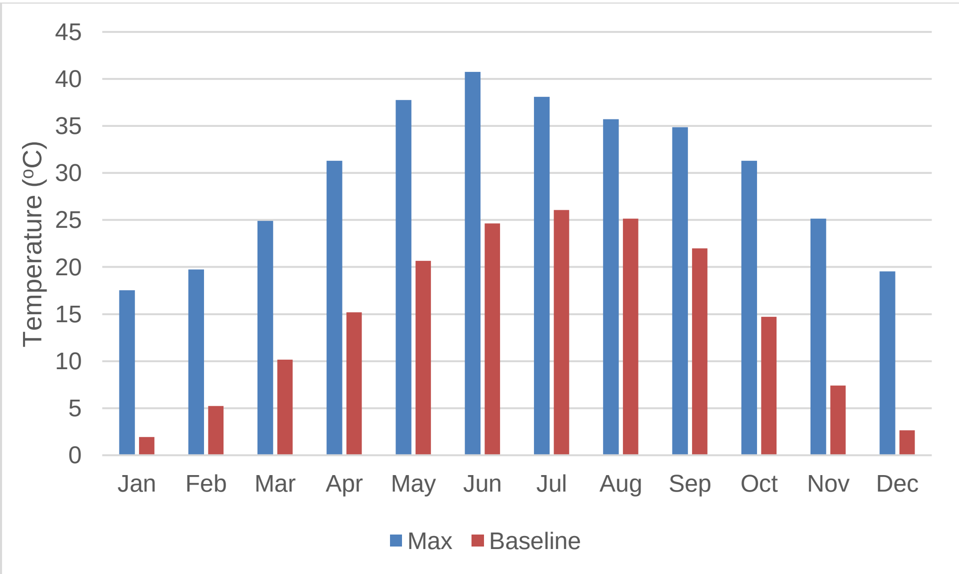


Figure 1-5: Monthly Temperature data of Kamara and Risalpur

14. The seasonal data for precipitation shows relatively consistent seasons across the basin, with:

1) Early Spring rainy season (Feb-Apr)
2) Spring dry season (May-Jun)
3) Summer rainy seasons (Jul-Sept)
4) Winter dry season (Oct-Jan)

15. It is significant to note the timing of the start and end of both the rainy and the hot seasons, because these have a direct impact on the growing season of the crops in the region, especially at high elevations.

2. CLIMATE CHANGE ANALYSIS

2.1.1 Predicting the future climate

16. Climate change projections are an estimate of the response of the climate system to possible greenhouse gas and aerosol emissions over the next century. Such projections are typically based on climate model simulations. The modelling methodology for generating climate change projections is shown in Figure 2-1.

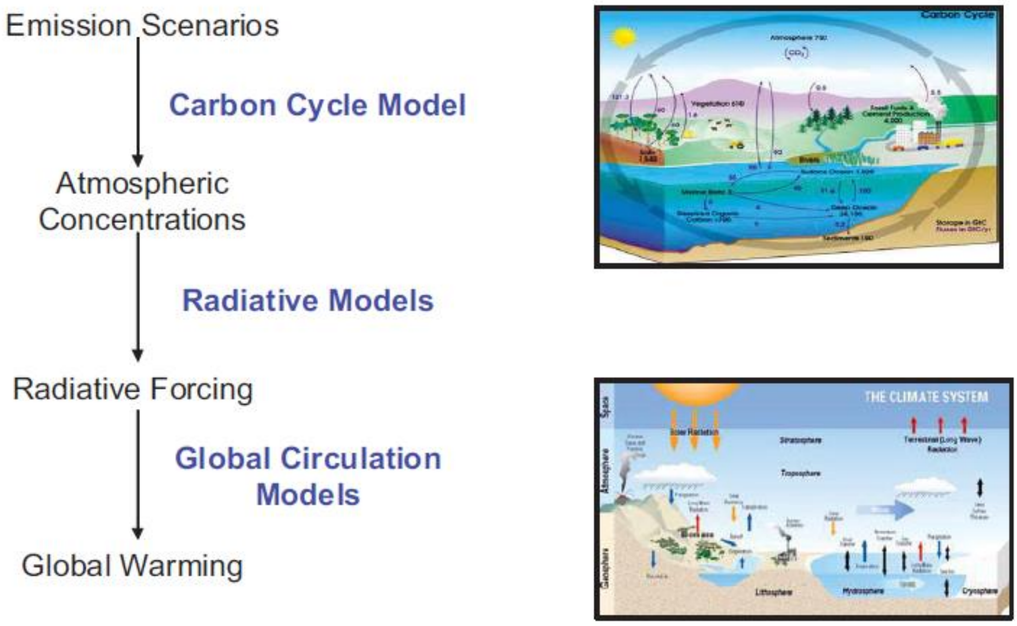


Figure 2-1: The modelling methodology for generating climate change projections (Source: Climate Change Catchments and Coasts, University of the Sunshine Coast)

17. The impacts of climate change will be significantly influenced by the greenhouse gas emissions which occur now and in the future. Emissions scenarios have been devised to provide a standardised method for estimating the potential future concentrations of greenhouse gas emissions. These scenarios are based on assumptions about the future evolution of society, including assumptions about demographic, socioeconomic and technological developments.

18. To estimate future climate change, IPCC developed a series of greenhouse emission scenarios-Special Report Emission Scenarios (SRES) which represented different assumptions on pollution, land use change and other driving forces of climate change. This scenario list was refined to six families for application in risk assessments with the descriptors A1FI, A1B, A1T, A2, B1 and B2.

19. In 2005, the process moved away from SRES with the development of Representative Concentration Pathways (RCPs) introduced at an IPCC Expert Meeting on Emissions Scenarios, followed by IPCC workshops (2005, 2007). For the first time the RCPs include scenarios that explore approaches to climate change mitigation in addition to traditional ‘no climate policy’ scenarios. Each RCP represents a different emission pathway: RCP8.5 leads to greater than 1370 PPM (parts per million) CO_2 equivalent by 2100 with a continued rise post-2100.

Table 2-1: Emission Pathways and Global Mean Surface Temperatures for Various Scenarios

Scenario	Global mean surface temperature °C		Emission Pathway
	2046-2065	***2081-2100***	
	Mean [1]	***Mean*** [1]	
RCP8.5	*2.0*	*3.7*	RCP8.5 peaks by 2100 at 1370 PPM CO_2 equivalent to 2100 without overshoot;
RCP6.0	*1.3*	*2.2*	RCP6.0 stabilizes by 2100 at 850 PPM CO_2 equivalent to 2100 without overshoot;
RCP4.5	*1.4*	*1.8*	RCP4.5 stabilizes by 2100, but at 650 PPM CO_2 equivalent without overshoot;
RCP2.6	*1.0*	*1.0*	RCP2.6 peaks at 490 PPM CO_2 equivalent before 2100 and then declines.

[1] Projected change relative to base period of 1990 - 1995

2.1.2 Global Circulation Models (GCMs)

20. Global Circulation Models (GCMs) are complex, three-dimensional climate models that consider a range of factors with potential to influence our global climate system. They are also referred to as Global Climate Models.

21. GCM outputs have been widely used to assess climate change impacts for various geographical regions of the world. The IPCC obtains outputs from a range of GCMs which have been developed by more than a dozen scientific institutions across the globe, including the Australian Commonwealth Scientific Industrial and Research Organization (CSIRO), NASA and the Hadley Centre in the United Kingdom.

22. GCMs provide outputs at a global scale. Two methodologies exist for translating this information to regional and sub regional scales. These processes are referred to as pattern downscaling and dynamic downscaling.

23. Over time there has also been an expansion in modelled variables, including both the marine and atmospheric environment. For AR5, many models have daily varying temperatures (with minimum, mean and maximum values) so that change patterns can be extracted for the first time; AR4 models did not contain this information. Only 12 AR4 GCMs produced daily precipitation outputs; with AR5 more daily outputs results in better modelling of extreme rainfall events.

2.1.3 Projected Climate Variability for the project area

24. Following projections for the climate change have been carried out SimCLIM (Simclim, 2013) that uses pattern downscaling methodology, where outputs are generated by adjusting local climate variables.

2.1.3.1 Temperature

25. Based on analysis of observational data, the IPCC (IPCC 2007) has identified that there is evidence of increasing temperatures across the globe. The analysis Kamra and Risalpur station also shows increasing trend to support this IPCC statement as, in general terms, the local data indicates that annual mean temperatures have been increasing across the Pakistan.

26. The IPCC (2007) has also indicated that temperatures will continue to shift in concert with increasing atmospheric concentrations of greenhouse gas emissions. Fewer cold days

and more hot days are expected, with associated shifts in annual and seasonal means and extremes.

27. The future climate change is subject to considerable uncertainty. Any climate change scenario constructed on single Greenhouse Gas (GHG) emission rate and/or individual GCM output is generally considered inappropriate for vulnerability and assessment purposes, because it cannot provide information of the uncertainty range associated with its projection.

28. In this study, to reflect the uncertainties in future GHG emission rates and in climate sensitivity, a combination of different GHG Representative Concentration Pathways (RCPs) and climate sensitivities are used to characterise the future climate change scenario with the associated uncertainty range. RCP6.0 represents a middle range future global change scenario, and has been therefore used as an indicator of the median projection of the future global change.

29. Higher annual mean temperature are associated within the project area. Figure 2-2 shows the mean annual temperature within the project area for the current climate (1960-1995) along with mean annual temperatures for the project area for the 2050 and 2100 timeframes using ensemble of 40 GCM for RCP 6.0.

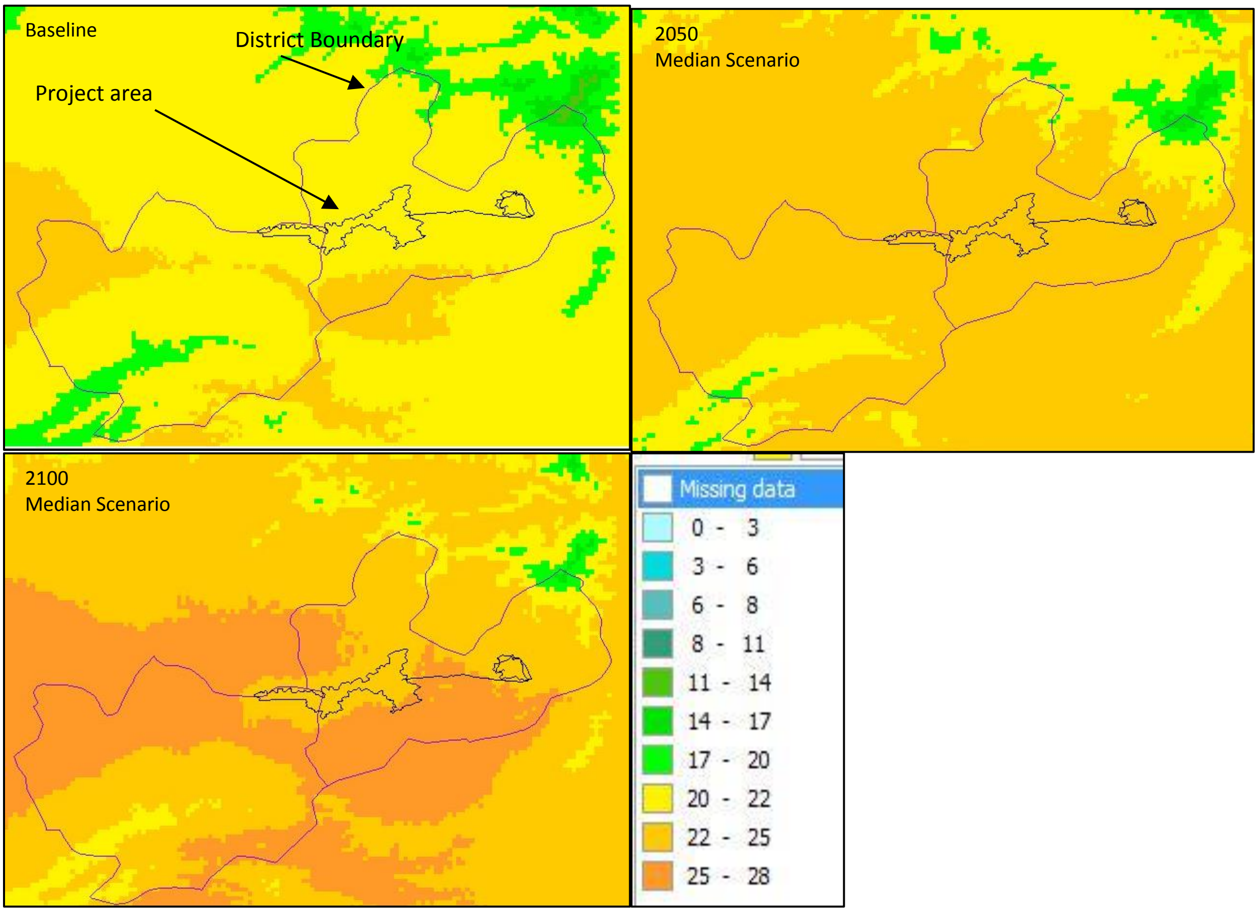


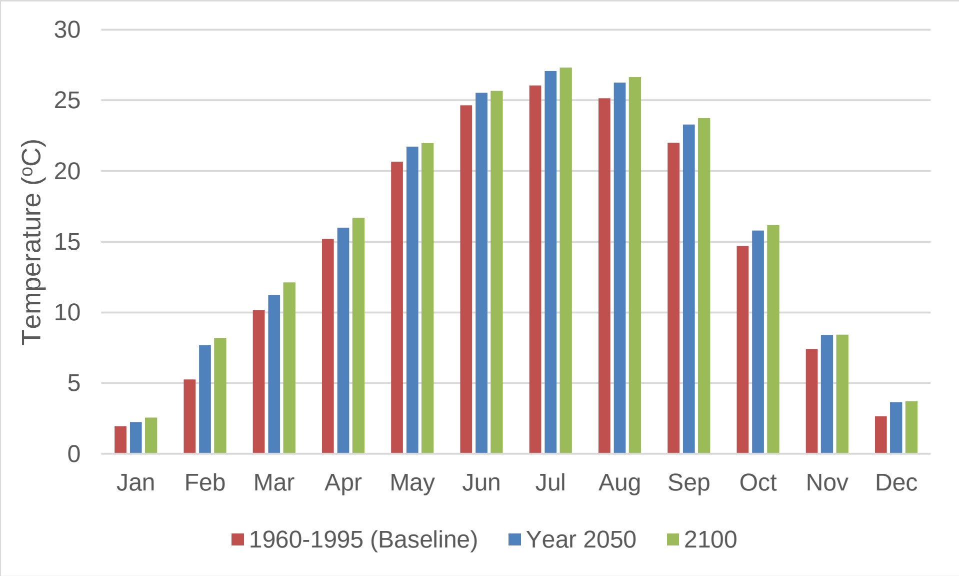
Figure 2-2: Distribution of Annual Mean (^{0}C) Temperatures for the Project Area (Baseline[2]), Year 2050 and Year 2100 (Source: WMO Included in the Sim CLIM Model)

30. During the last century, average annual temperature over Pakistan increased by 0.6 °C, which is in agreement with the global trend, with the temperature increase over northern Pakistan being higher than southern Pakistan (0.8 °C versus 0.5 °C). Studies based on the

[2] Baseline climate represents period as 1960 to 1995

ensemble outputs of several Global Circulation Models (GCMs) project that the average temperature over Pakistan will increase in the range 1.3°C to 1.5 °C by 2020, 2.5°C to 2.8 °C by 2050 and 3.9°C to 4.4 °C by 2080, corresponding to an increase in average global surface temperature by 2.8°C to 3.4 °C by the end of the 21st century.

31. The projections for Kamra and Risalpur shows that winters may be slightly cooler in the future, while summer may be warmer (



32. Figure 2-4 and Figure 2-4) and in Table 2-2.

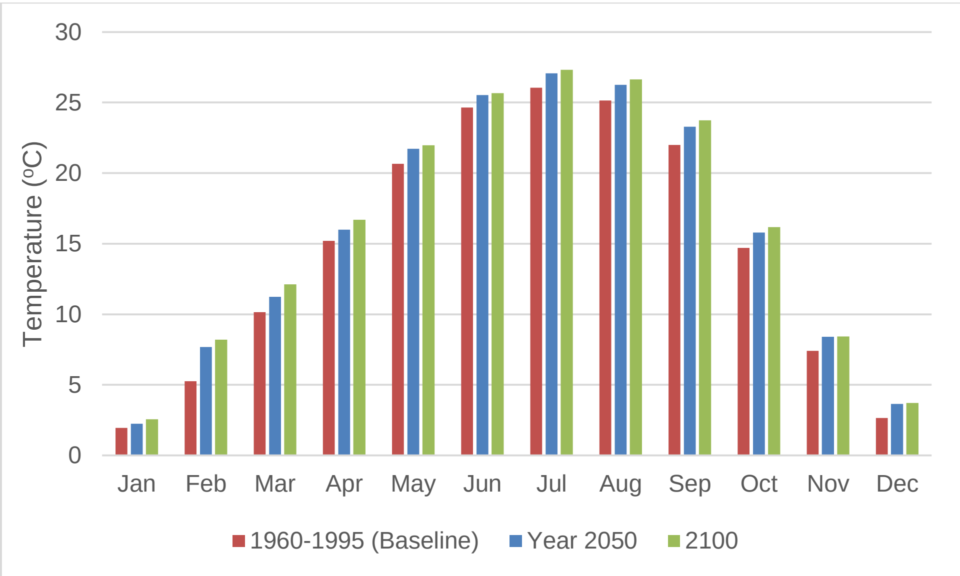


Figure 2-3: Projections of Temperature for stations (Kamra and Risalpur)

Table 2-2: Mean Monthly Temperatures using Median Scenario (RCP 6.0)

Month	Mean Min Temperature (^{O}C)			Mean Max Temperature (^{O}C)		
	Baseline	2050	2100	Baseline	2050	2100
Jan	1.95	2.25	2.56	17.55	19.16	21.51
Feb	5.25	7.69	8.19	19.75	21.47	23.99
Mar	10.15	11.24	12.11	24.9	26.27	28.24
Apr	15.20	16.00	16.69	31.3	32.62	34.52
May	20.65	21.73	21.97	37.75	38.98	40.75
Jun	24.65	25.54	25.67	40.75	41.94	43.67
Jul	26.05	27.07	27.33	38.1	39.10	40.54
Aug	25.15	26.26	26.65	35.7	36.70	38.15
Sep	22.00	23.28	23.74	34.85	35.90	37.41
Oct	14.70	15.79	16.18	31.3	32.45	34.14
Nov	7.40	8.39	8.43	25.15	26.35	28.11
Dec	2.65	3.65	3.71	19.55	21.05	23.21
Avearge	14.55	15.74	16.10	29.7	31.00	32.85

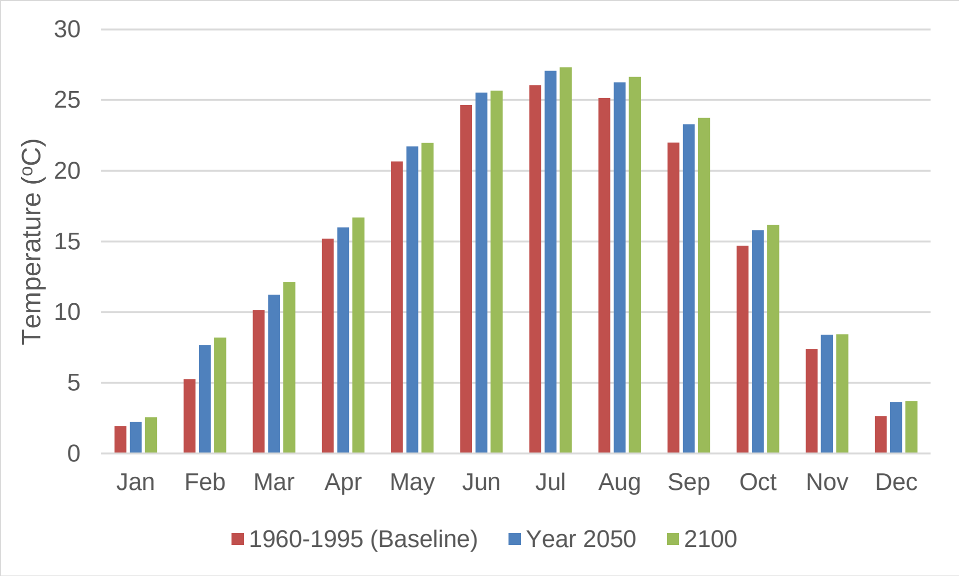


Figure 2-4: Projected Monthly Minimum Temperature for the year 2050 and year 2100 for the Project Site Using Ensemble of 40 GCMs and IPCC 6.0 RCP

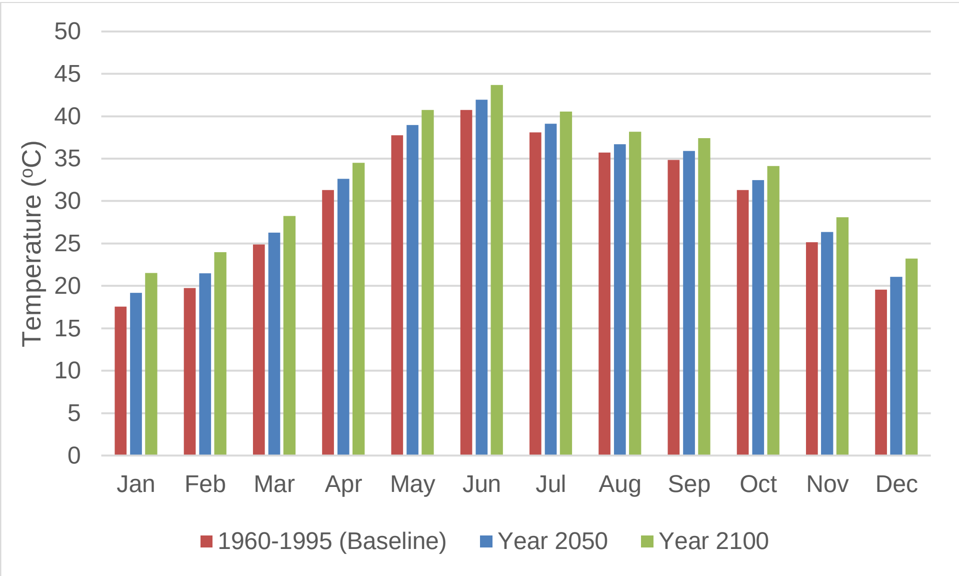


Figure 2-5: Projected Monthly Maximum Temperature for the year 2050 and year 2100 for the Project Site Using Ensemble of 40 GCMs and IPCC 6.0 RCP

2.1.3.2 Rainfall

33. The rainfall related climate variables and their aftermath which could become hazardous for the project include torrential rain, flood and landslide. Details of the observed rainfall data and their future change projections for the project area are discussed below:

34. The mean annual rainfall is 697.80 mm, July and August are the wettest months with 118 mm and 214 mm whereas November and December are the driest months with rainfall of 15.5 mm and 25 mm respectively.

35. The median scenario change projection indicates the annual rainfall change in the area will likely not be substantial; 5% for 2050, however, there will be quite obvious change for 2100, with an average increase across the area of 8% as shown in Table 2-3.and Figure 2-6.

Table 2-3: Projected Monthly Rainfall for Using Median Scenario (RCP 6.0)

Month	Rainfall(mm)		
	Baseline (1960-95)	**2050**	**2100**
Jan	50.05	50.31	50.57
Feb	85.25	82.96	80.77
Mar	76.75	76.83	76.92
Apr	63.65	60.82	58.13
May	24.6	25.56	26.50
Jun	38	40.12	42.15
Jul	179.85	190.48	200.65
Aug	214.15	245.71	259.67
Sep	69.15	75.04	76.05
Oct	21.95	22.94	23.88
Nov	15.5	15.52	15.53
Dec	25	23.85	22.75
Total	864	910	934

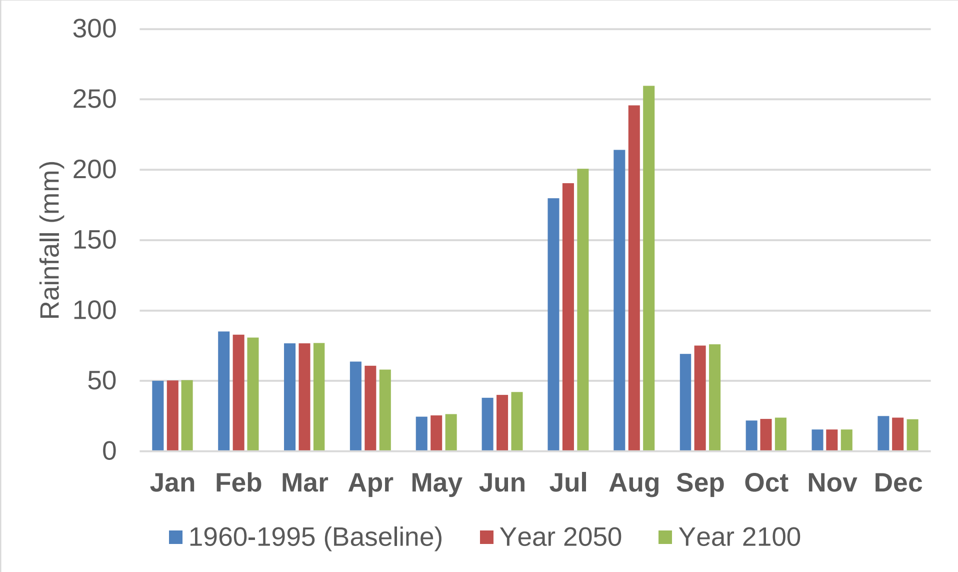


Figure 2-6: Projected Monthly Rainfall for the year 2050 and year 2100 for the Project Site Using Ensemble of 40 GCMs Under IPCC Emission Scenario RCP 6.0

36. Figure 2-7 shows the annual spatial variability of rainfall for the baseline and future periods and Figure 2-8 shows the percentage change in annual rainfall in the region for the year 2050 and year 2100. It clearly indicates that annual rainfall will increase in this region as compared to baseline period. Similarly Figure 2-6 illustrates that % change in PHLCE area lies between 5 to 6% for 2050 and 6 to 8% for 2100 year compared to baseline period.

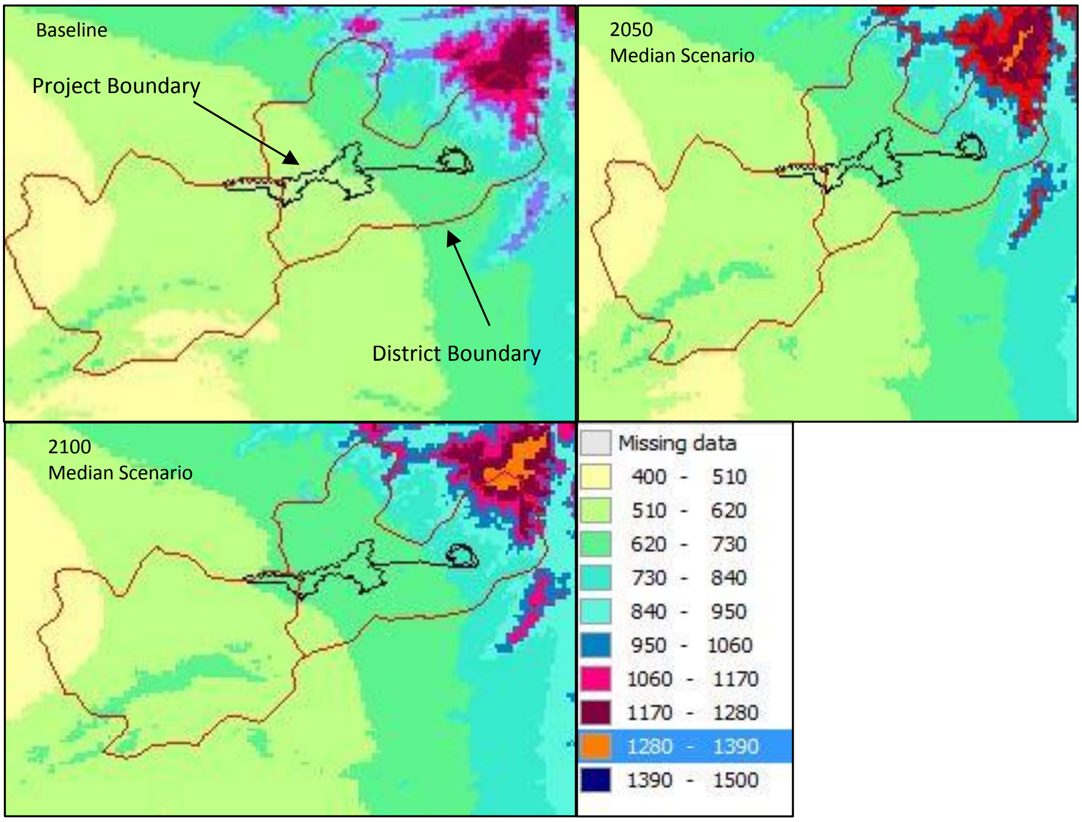


Figure 2-7: Projected Annual Rainfall (mm) for the Baseline Period, year 2050 and Year 2100 for the Region Using Ensemble of 40 GCMs Under IPCC Emission Scenario RCP 6.0

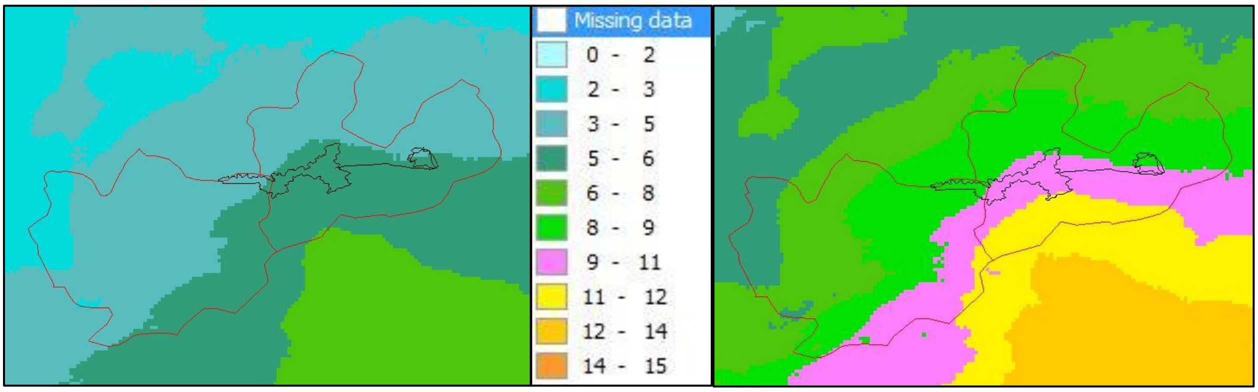


Figure 2-8: %age Annual Rainfall for the Baseline Period, year 2050 and year 2100 for the Region Using Ensemble of 40 GCMs under IPCC Emission Scenario RCP 6.0

2.1.4 Impact of Climate Change

2.1.4.1 Rainfall Intensity and flooding

37. It is projected that climate change will impact on the frequency and intensity of extreme rainfall events, with fewer but larger rainfall events expected (IPCC, 2007). However, degree of variation of floods (i.e., variation of return periods) cannot be estimated with confidence as different models result in different results. However, as discussed in preceding section, the annual rainfall is expected to increase by about 8% by year 2100. This increase is not uniform and is more pronounced during wet months, This means that more frequent floods will be experienced and consequently adequate discharge capacity of cross-drainage structures must be provided.

38. As discussed in the previous section that there is likely to be increase in the temperature and rainfall in the project area with more extreme events will be the characteristics of the future weather.

39. Higher temperatures could increase evaporation leading to drier soils. Moreover, due to shift in rainfall patterns will reduce water availability in the winter season. As a result of climate change, rainfall events which are the same size as the historic 1-in-100 year rainfall event are expected to occur more frequently in the future. In addition to the potential for more frequent flooding, this shift in the characteristics of rainfall events is also likely to:

- ✓ Increase runoff and associated pollutants
- ✓ Increase soil erosion
- ✓ Impact on vegetation cover which provides soil stability.

40. The Catchments of nullahs / streams crossing the cross-drainage structures are generally small (less than 150 sq.km). For such catchments, the frequency rainfall and frequency of flood is almost same. Accordingly, it can be concluded that under the projected climate change scenario, 100-year flood is expected to increase by 10% by year 2050. The effect of this change has been incorporated in the design by considering 10% additional discharge through the cross-drainage structures on nullah crossings.

2.1.4.2 Impact on Agriculture Production

41. Climate Change Impact on agriculture have been evaluated. Climate Change Simulations have been conducted and described in Section 2.1.3, while Climate Change Impacts on Agriculture are discussed in more detail in Appendix 07 (Irrigated Agriculture Development). Using the 2050 projected climatic parameters the estimated gross irrigation requirements considering the presently designed cropping pattern is shown below in Figure 2-9

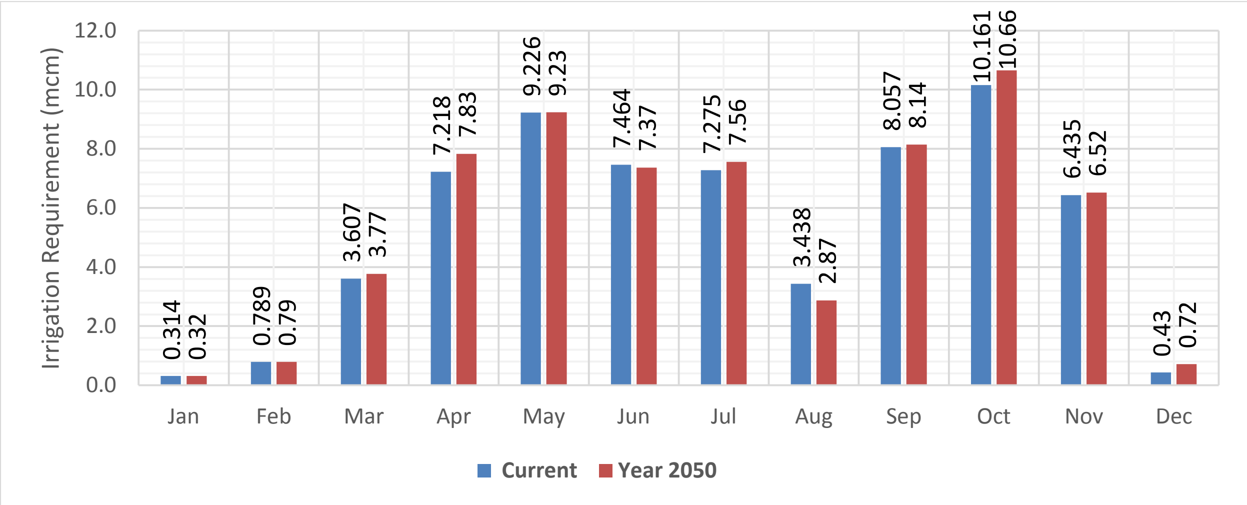


Figure 2-9 Baseline and Projected Irrigation Requirements with Climate Change

42. There will a nominal additional water requirement of about 1.36 MCM, which is available from the main source (Tarbela Reservoir).The additional requirements fall mostly within the designed canal capacity except for the month of October, wherein the supplies are projected to be 5% less than the demand. Thus there will be minor stress of 5% to be tolerated by crops during this period. During the remaining period, the required additional discharge can be easily accommodated by the PHLCE system.

43. **Management of Water Scenario:** It may be noted that the simulations described in this section consider keeping the same cropping pattern and sowing periods as for baseline conditions. However, Climate Change is a gradual process. In actuality, the sowing time of crops grown at high intensity like maize and wheat will have to be staggered to reduce the peak requirements during May and October which is practicable rearrangement. Thus the water stress faced by crops will be even less if the crops sowing period is adjusted as per Climate being experienced. In addition, irrigation efficiency can be improved by encouraging farmers to adopt High Efficiency Irrigation System (HEIS) that will reduce gross irrigation requirements.

44. Therefore, it can be concluded with confidence that there will be no negative effect on agriculture production estimated for PHLC Extension project due to climate change as impact will be minor and within control. Practical mitigation solutions are available. However, farmer's awareness need to be increased with regard to farming practices and water saving techiques which are discussed later in this Appendix.

3. CLIMATE CHANGE VULNERABILITY ASSESSMENT AND ADAPTATION MEASURES

3.1.1 Impact on Structures

45. Construction materials recommended are conrete, steel and earthwork. All of the construction materials can withstand the changes in temperature and precipitation. However, as precipitation increases, the O&M cost of maintenance of inspection paths will increase with time.

3.1.2 Cross-Drainage Structures

46. As discussed in Section 2.1.4.1 (Rainfall Intensity and flooding) There is likelihood of increase in flood events. The cross-drainage structures will need to be designed for higher discharges. Provision has been kept in design for meeting 10% additional discharge through cross-drainage structures. In addition, for all major crossings, return-period of 100-year has been adopted.

3.1.3 Impacts on Agriculture Production

47. As discussed in Section 2.1.4.2, no significant impact on agriculture production are foreseen. However, impacts related to pest-management may arise. This can be dealt with by application suitable pest-control mechanisms, which will be carried out through Agriculture Extension. In addition, with the Climate change, shift in crop-sowing periods and may be required.

4. COST OF CLIMATE ADAPTATION MEASURES

48. Climate change adaptation measures included in the project are:

- Increased capacity of Cross-drainage structures for flood passage.
- Farmer's capacity building for introduction of High Efficiency Irrigation System, farmer's field trips and establishment of demonstration centers.

49. A cost of US$ 0.84 million is included in the project cost

Item	Units	Amount
Cross-Drainage Structures (Aqueducts, Syphons, Drainage Culverts, Super passages)	PKR Million	15.0
Farmers Capacity Building		
Demonstration Plots	PKR Million	30.0
Introduction of HEIS	PKR Million	42.5
Farmer's Field Trips	PKR Million	1.1
Total	PKR Million	88.6
	USD Million	0.84

5. REFERENCES

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