TA – 7984 NEP
May, 2014

Mainstreaming Climate Change Risk Management in Development

1 Main Consultancy Package (44768-012)

USAI VULNERABILITY ASSESSMENT REPORT

PANCHTHAR DISTRICT

Prepared by ICEM – International Centre for Environmental Management

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Prepared for Ministry of Science, Technology and Environment, Government of Nepal

Environment Natural Resources and Agriculture Department, South Asia Department, Asian Development Bank

Version A Draft for Comment

ACRONYMS

ADB	Asian Development Bank
AF	Adaptation Fund
AP	Adaptation Planning
CC	Climate Change
cm	Centimeter
^{0}C	Centigrade
DDC	District Development Committee
DEWATS	Decentralized Wastewater Treatment Systems
DI	Ductile Iron
DWSS	Department of Water Supply and Sewerage
GI	Galvanized Iron
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GON	Government of Nepal
HDPE	High Density Poly Ethylene
Km	Kilometer
LPS	Liters per Second
M	Meter
M&E	Monitoring & Evaluation
MH	Manhole
MoH	Ministry of Health
MoSTE	Ministry of Science, Technology and Environment
NPR	Nepali Rupees
NRW	Non-Revenue Water
O&M	Operation & Maintenance
RCC	Reinforced Concrete Construction
RR	Random Rubble
STP	Sewage Treatment Plant
TA	Technical Assistance
TDC	Town Development Committee
ToR	Terms of Reference
VA	Vulnerability assessment
VDC	Village District Committee
UNEP	United Nations Environment Programme
USAI	Water Supply and Sanitation
WB	World Bank
WC	Water Closet
WHO	World Health Organization
WRI	Water Resources Institute
WS	Water Supply
%	Percentage

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1 DISTRICT ASSETS/SYSTEM PRIORITIES

1.1 Urban Settlements and Infrastructure (USAI) in Panchthar District.

Panchthar district is a mid mountain district located in Mechi zone of Eastern Development Region of Nepal (see Map). It is bounded by Sikkim state, and Darjeeling of West Bengal state of India towards the east, Terhathum and Dhankuta districts on the west, Ilam and Morang districts on the south, and Taplejung district on the north. With Phidim as its district headquarter, the district consists of 41 village development committees, and covers an area of 1241 sq.km, and has a population of 191817 (2011).

Phidim, has the strategic advantage of being at the crossroad of two national highways – Mechi Highway and Mid-Hill Highway - linking Ilam town and Chandragadhi/Bhadrapur, the Indian border town in the south with Taplejung, and Basantpur, another proposed new town in Terhathum district towards the west and the Chyangthapu Market town towards the east at the proximity of Sikkim border.

As discussed in the district baseline study, strategic infrastructure in urban sector in Panchthar district provides a basis for identifying the district assets/systems for vulnerability assessment. It consists of the riverside settlements as well as the compact high altitude settlements, the buildings (both public and private buildings) and the other infrastructure components – the road network, water and sanitation, storm drainage system and solid waste etc. Those are largely confined within small towns and market centres: Phidim (district headquarter & recently declared municipality), Rabi, Yasok, Amarpur, Tharpu, Changthapu, Ranke, and Dhurbise Panchami (see the Map below).

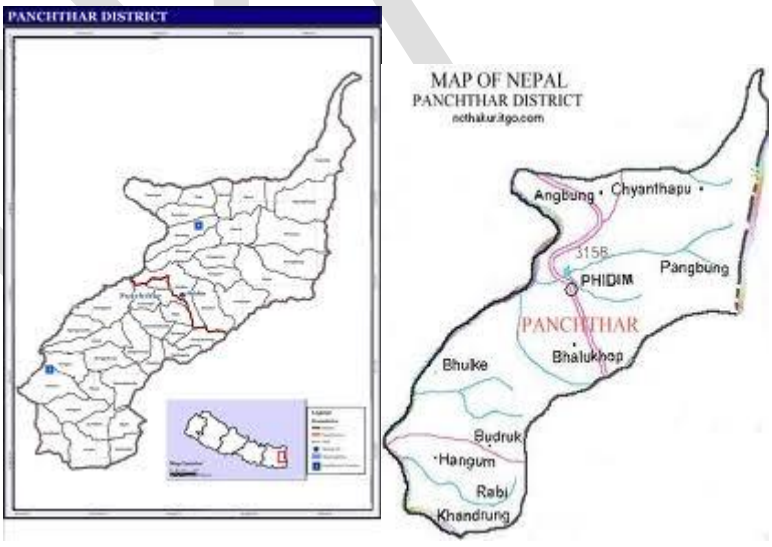


Figure 1: Panchthar District Map & Market centres

The major components of strategic infrastructure in the USAI sector fall under the jurisdiction of: the DUDBC within Ministry of Urban Development (MoUD); the local bodies (DDC and VDCs); the district line agencies related to roads, water supply and sanitation; and the town development committees (TDCs). The district baseline study is confined to only those assets in the USAI sector created through the annual programs of DUDBC spanning a period of 2 fiscal years from 2012/13 to 2013/14. Those assets relates to: government buildings, urban amenities (e.g. bus parks, temple complex etc), and infrastructure like road and drains, and land development schemes. (Please refer Annexes D, Panchthar Baseline report).

The building sector includes the buildings for the various government offices, and health related buildings as reflected by the annual programs of DUDBC division office. The physical development plan components – the land use plan and zoning frame work, and the land development programs falls under the jurisdiction of the Phidim TDC responsible for planned development of Phidim new town.

As presented in the baseline report, the above programs are formulated and executed within a planning framework provided by the DUDBC Ilam Division Offices's annual programs for Panchthar district. The priority assets based on the assets inventory, as the Table 1 and Panchthar Map (figure 1) indicates, is confined within the newly created Phidim municipality, Changthapu market centre and the other settlements, functioning as the market centres within the district. The field observations were limited to those settlements with a road access owing to time constraints as well as the access difficulties.

The assets/systems in the urban sector within the district (total area 1241 sq. km., altitude 685 – 3636 meter) are very much influenced in terms of climate change by the following factors:

1) The characteristic geographic features of the district because of its location along the Mid-Hill range of the country between the Taplejung district in the north and Ilam and Jhapa districts in the south, and consisting of the river valleys and steep slopes.

2) Climatic diversity ranging from the sub-tropical climate in the river basins below 1000 m altitude, and the temperate climate in the Mid-Hills below 2000 m up to cold temperate (above 2000 m) .

3) The characteristic land use features consisting of: the deciduous, coniferous and tropical mixed forests; grazing land, shrubs and bushes; cultivated lands along the Tars and valley flood plains; sloping terraces followed by water bodies and settlements.

4) The major river systems with the Tamor and its tributaries which defines the watershed areas for the urban and rural settlements within the district. (see the figure 1).

5) A wide variety of settlement typologies (agglomerated, compact, linear and dispersed settlements), responding to cultural and natural diversities, which developed along trekking trails and sites of historical and religious importance as market/service centres

1.2 Criteria for Priority Assets

Identification of the priority assets were carried out on the basis of:

i. The field visits to the four areas - Phidim town, the seat of district headquarter; Yasok market centre at a distance of 15 km and two hours drive from Phidim along the earthen road; Gopetar market centre at a distance of 30 km and 2 hour drive from Phidim; and .

ii. Due consultation with the DUDBC officials at Ilam office and with the officials of the different district level government offices including the technical and administrative staff members of Phidim TDC and Phidim VDC (already declared as a municipality).

iii. The concerned local persons including the business persons, local political representatives and the individuals from the various walks of life at Phidim town, Gopetar, Yasok and Pauwa 'Bhanjyang' market centres.

The key criteria for the assets prioritization were:

- Infrastructure of national strategic importance
- Infrastructure of district strategic importance
- Infrastructure that has been impacted by past extreme events
- Infrastructure located in areas prone to past extreme events

In addition the other potential aspects contributing to vulnerability were considered. On the basis of the above criteria the following assets were short-listed:

Table 1: The Priority Assets in Panchthar district

S.No.	Assets Selected	Geographical Location	Reason/s for inclusion
1	Gopetar Market Settlement (VDC, Ward)	Northern belt of the Panchthar district.	Thunderbolt events in the past with loss of lives and property.
2	Yasok market centre	Located in western Zone of the district.	Drought conditions, temperature increase, or other climate induced events.
3	Proposed Thapa Tar Landfill site behind Jorsal Hill	Phidim VDC	The asset of district strategic importance
4	Government Buildings Complex, District headquarter, Ward	Phidim VDC	The asset of district strategic importance.
5	Central City Core of Phidim town	Phidim VDC	Flash floods in the past with a loss of lives and property. The asset of national and district strategic importance.
6	The Bus Park Jorsal Link focused urban development ,	Phidim VDC	The asset of district strategic importance

	Phidim, Ward 1		
7	Puwa Bhanjyang (Ridge)	Puwa VDC	Trend towards less snowfall since last 3 years in the area.

Two assets out of 7 -listed USAI assets as listed above drawn from Panchthar Baseline Report (Section 2.2.1) - Yasok market centre and Central City Core of Phidim town - were selected as priority assets for vulnerability assessments and adaptation planning in Panchthar District. The detailed information on each asset is outlined in the baseline report for Panchthar district. Brief discussion on those two assets and its components are outlined below.

1.3 Priority Assets

1.3.1 Yasok Market Centre

The asset is the housing cluster of houses and commercial buildings located in Ward 2 of Yasok VDC which is located in the southern western belt of Panchthar district. The VDC has a population of 5,765 and 1,145 households in 2010.

It is a typical compact rural settlement found in the hilly belt of Nepal. It lies at a distance of 15 km from Phidim, and is accessible through the Mid-Hill Highway which meets Mechi Highway at Jarsol around 2 km from Phidim town.

As per the report of Nepal Red Cross Society, Panchthar District reports, the VDC, where the asset is located, is susceptible to drought, storm and less rainfall. The finding is based on the disaster risk analysis drawn from the previous records of extreme events in the area.

As reported by the local people during the community interaction, the following extreme climatic events in the Yasok VDC settlements area are presented below:

- Decreasing rainfall trend being observed in the area resulting into lesser agricultural production.
- Increasing trend of temperature rise resulting into mosquito breeding, and the incidence of the malarial diseases.
- Increasing storm events.
- Increasing trend of out-migration of the people due to climate change in the form of drought conditions in the asset area, and due to the difficulties encountered for the livelihood by the people.

1.3.2 Phidim Town Central Core

The selected asset – the city core of Phidim – is a main market centre of Phidim covering the wards 1, 3 and 4 Phidim VDC. The Mechi Highway passes through it, and the Tamor river is situated by the market centre. The market centre constitutes 50 % of total VDC population in 2010 which figures out to be around 6400. As a spontaneously developed area, the Asset

is not planned properly, and is a sort of organic growth very common in a majority of urban areas of the country.

As per the District Development Profile 2012, Phidim VDC, where the asset is located, is susceptible to water induced disaster in the form of flood. It has also been reported that in the year 2010 flood event caused the death of two persons, and two families were affected in Ward 3 of Phidim VDC.

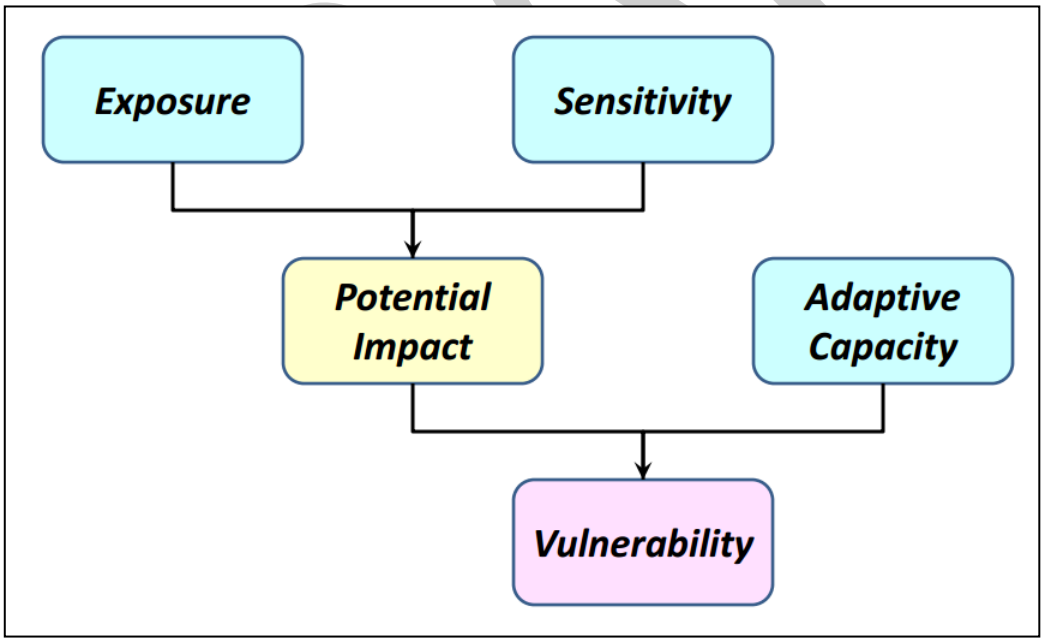
2 VULNERABILITY ASSESSMENT METHOD

2.1 VA Method

Climate change vulnerability in the urban sector context is a function of a USAI asset system's exposure to climate effects, sensitivity to climate effects, and adaptive capacity. Adaptive capacity refers to the systems' ability to adjust to cope with existing climate variability or future climate impacts

The VA method followed to assess the vulnerability of USAI assets is widely used technique and tested in several parts of the world. The further details follow below.

Figure 2-1: VA Process



Exposure refers to whether the asset or system is located in an area experiencing direct and indirect impacts of climate change. In other words, it refers to the extent to which an asset comes into contact to climate change (CC) threats seen in terms of change and shift in regular climate (temperature and precipitation) and in the CC events (e.g., increases in flood water levels, flash floods, localized pooling/inundation, storms, landslides, drought). The greater the exposure, the higher the sensitivity to climate change. For example, the USAI assets located in historic landslide zones are more exposed and therefore more sensitive to

increased rainfall and localized flood waters. The exposure also takes in to account the critical aspects such as the location of asset, intensity and duration of the climate threats towards the asset and the magnitude of the events.

Sensitivity refers to how the asset or system fares when exposed to an impact. It also implies the degree to which an asset is directly or indirectly affected by changes in climate conditions (e.g., temperature and precipitation) or by the magnitude of the specific CC events. In other words, sensitivity refers to how the asset or system fares when exposed to the CC impacts. In the case of USAI assets, sensitivity is governed by the overall physical status of the settlements and its component structures, the materials used in the construction and its quality, levels of maintenance, the extent of planned development.

Impact: Once the exposure and sensitivity assessment are performed, based on the assessment the severity of the impact is estimated using the guiding matrix as shown below:

Figure 2-2: Determining Impact

		Exposure of system to climate threat				
Sensitivity of system to climate threat		*Very Low*	*Low*	*Medium*	*High*	*Very High*
	Very High	*Medium*	*Medium*	*High*	*Very High*	*Very High*
	High	*Low*	*Medium*	*Medium*	*High*	*Very High*
	Medium	*Low*	*Medium*	*Medium*	*High*	*Very High*
	Low	*Low*	*Low*	*Medium*	*Medium*	*High*
	Very Low	*Very Low*	*Low*	*Low*	*Medium*	*High*

Adaptive Capacity refers to the availability of a system to accommodate or cope with climate change impacts with minimal disruption. This takes into account the range of available adaptation technologies and the funds that are available to meet such technologies, local skills and knowledge base, management responsiveness and relevant polices that make such adaptation to happen and the locally available materials to address such adaptation.

Vulnerability Scoring: Based on the impact and adaptive capacity assessments, the vulnerability of the asset against the CC threats is estimated using the guiding matrix as shown below:

Figure 2-3: Determining Vulnerability

Adaptive Capacity	Impact					
		Very Low Inconvenience (days)	Low Short disruption to system function (weeks)	Medium Medium term disruption to system function (months)	High Long term damage to system property or function (years)	Very High Loss of life, livelihood or system integrity
	Very Low Very limited institutional capacity and no access to technical or financial resources	Medium	Medium	High	Very High	Very High
	Low Limited institutional capacity and limited access to technical and financial resources	Low	Medium	Medium	High	Very High
	Medium Growing institutional capacity and access to technical or financial resources	Low	Medium	Medium	High	Very High
	High Sound institutional capacity and good access to technical and financial resources	Low	Low	Medium	Medium	High
	Very High Exceptional institutional capacity and abundant access to technical and financial resources	Very Low	Low	Low	Medium	High

2.2 Suitability of VA Method to USAI Sector

The approach used for this vulnerability assessment is based on the methodological guidelines prepared by UNEP and Peking University (UNEP, 2009) and are in line with the international VA processes that are widely used in several projects across the globe.

Vulnerability assessment is an useful tool for the USAI assets for identifying potential risks of climate change, including climate variability and extremes. Apart from detecting threats, vulnerability assessment of the USAI assets will also identify gaps in existing information, and will also provide the appropriate indicators and management measures to reduce negative impacts. Moreover, the assessment enhances public awareness about potential threats to the USAI assets. It would also help the decision-makers with options to evaluate and modify existing policies, and to implement measures to improve urban settlements management and infrastructure services. Specifically, the VA assessment would help to:

- Assess the vulnerability of existing urban settlements (market towns/service centers) and their constituent components to CC threats, and its impact on development options, human well-being and the environment;
- Identify the potential impacts of climate change on the urban ecosystems including the USAI components, and assess the current adaptive capacity of the urban sector;
- Create a knowledge base of scientific data and information on urban sector including urban settlements and infrastructure components;

2.3 Climate Change Threat Profiles

The climate change threat profiles for Paachthar District were prepared by the Hydrological Modeling teams and the information had been passed on to all the experts prior to the field visit. The threat profile is annexed in Annexure 1. The climate change threat profiles for Paachthar were studied and their relevance to the USAI sector is outlined below:

2.3.1 Increase/decrease in precipitation

Looking in to the threat profile for precipitation the following conclusions can be drawn:

- Increasing number of extreme rainfall events – events that now occur every 20 years are projected to occur every 2 years
- Duration of extreme rainfall events with high intensity will occur more often than before. For example, 50mm/hr rainfall intensity has duration of 20 minutes; in future 100mm/hr rainfall intensity will fall for the same duration.
- Increase in precipitation frequency and volume can be foreseen in future, this may trigger more landslides. Precipitation vs annual recurrence interval curve shows an increase in precipitation occurs more frequently. More precipitation can be seen in the catchment than that was never experienced before. For example in the past 100mm of precipitation used to occur at every 50 years but in future it can be seen at every 3 years.

2.3.2 Increase in temperature

Looking in to the threat profile for temperature the following conclusions can be drawn:

- Increase in average maximum temperature of up to 1.6^0C in the summer.
- Increasing number of dry days except in April and May- the average number of dry days in June is increasing from 6.3 to almost 6.9 days.
- More intense temperatures occur more frequently and the duration of such intense temperatures will be longer. This means, a temperature of 25^0C will be spread throughout the year for longer durations, this in turn triggers longer summer period than before.

2.3.3 Increase in flows

Looking in to the threat profile for hydrology the following conclusions can be drawn:

- Increased flows in Tamor River due to increase in rainfall is expected.
- Increasing wet season flow on the Shisne Khola – peak monthly average flow in wet season will increase significantly due to the cascade increase effect from Tamor River which is up to 170%.
- Increasing risk and severity of flash floods and increase flood duration during wet season.

3 VULNERABILITY ASSESSMENT RESULTS

The results of the vulnerability assessment are outlined in Annexure 2 of this report. However, a brief vulnerability assessment of two assets within Panchthar District is outlined below.

3.1 Yasok Market Centre

3.1.1 Asset Situation

The asset consists of a linear urban settlement consisting of a cluster of buildings with mixed commercial and residential uses along the ridge of the hill. A majority of the buildings are of permanent 'Paccki and semi-permanent types, and hence, seems to be of fairly good conditions. The photos as presented below present the physical conditions of the asset which seems to depict the poor state of infrastructure and built environment.

Figure 3.1: Houses with CGI roofing along earthen road. Figure 3-2 Upper stretch of Yasok market centre

Figure 3.3: Congested commercial street with the dwelling units. Figure 3.4:The row buildings with extensive use of CGI sheets.

3.1.2 Vulnerability assessment

The following section outlines the decisions undertaken in setting the levels of threat, exposure, sensitivity and adaptive capacity for the Yasok market centre.

3.1.2.1 Threat – Increased Temperature & decreased rainfall

The following section outlines the decisions undertaken in setting the levels of threat, exposure, sensitivity and adaptive capacity for the drought management.

Threat: Increased temperature and decreased rainfall

The following threats have been identified as likely to impact on the source point:

- Increase in average maximum temperature of up 1.6 °C in the summer
- Increasing number of dry days except in April and May – the average number of dry days in June is increasing from 6.3 to almost 6.9 days

Exposure: HIGH

The exposure is ranked as high for the following reasons:

- Duration: Increased temperature (up to 1.6^{o}C) with longer duration and more frequency is a threat to the human settlements and its constituent infrastructure components including buildings, water supply sources, and also to the agriculture sector.
- The increase in temperature will enhance evapo-transpiration from the catchment and as a consequence there is less recharge of water in sub-soil and eventually nothing reaches to the source for domestic water use and also for irrigation purposes.

Sensitivity: MEDIUM

The sensitivity is ranked as medium for the following reasons:

- The settlement forms, and the material, design and construction of the infrastructure (e.g. buildings, road network etc.) are not directly affected by the climate threat except the water sources affecting water supply situation.
- The most likely factor affecting the water sources is the underground condition of the recharge system and other conditions that help to hold the water in the roots and sub-soil. There is a need to further investigate in detail to identify the underlying factors that caused the sources to dry up and less recharge this year.

Impact: HIGH

From the guiding matrix, it can be seen that the impact is HIGH as well. The justification for high impact is given below:

- Due to the increased temperature and reduced rainfall scenario, urban infrastructure, particularly the buildings with extensive use of CGI sheets would be very uncomfortable to live indoors. The drying-up of water sources can be foreseen more frequently that further adds to deterioration of comfort level within the buildings and settlements, and that eventually affects water consumers as well as the agriculture industry.

- There is less water available that can cater for daily domestic purposes. Less water means reduced consumption with negative impacts on the living conditions within the settlement with negative impacts on hygiene and sanitation services as well.
- Less water for the communities and for agriculture purposes means, the communities might look for alternative living opportunities that might trigger migration.

Adaptive Capacity: MEDIUM

The adaptive capacity was ranked as medium for the following reasons:

- Within the financial and technical resources available, the VDC office has been executing the disaster relief programs through the DDC support.
- However, as reported in the community consultation process, it does not seem that any concrete steps were being taken up as the adaptation measures to counter the disaster threats in the form of drought due to lesser rainfall and storms.

Vulnerability Scoring: HIGH

As per the below guiding matrix, the vulnerability under increased temperature event is HIGH.

Adaptive Capacity	Impact: Very Low – Inconvenience (days)	Low – Short disruption to system function (weeks)	Medium – Medium term disruption to system function (months)	High – Long term damage to system property or function (years)	Very High – Loss of life, livelihood or system integrity
Very Low – Very limited institutional capacity and no access to technical or financial resources	Medium	Medium	High	Very High	Very High
Low – Limited institutional capacity and limited access to technical and financial resources	Low	Medium	Medium	High	Very High
Medium – Growing institutional capacity and access to technical or financial resources	Low	Medium	Medium	High	Very High
High – Sound institutional capacity and good access to technical and financial resources	Low	Low	Medium	Medium	High
Very High – Exceptional institutional capacity and abundant access to technical and financial resources	Very Low	Low	Low	Medium	High

3.2 Phidim Town Central Core

3.2.1 Asset Description

The selected asset – the central core of Phidim town – is a main market centre of Phidim covering the wards 1, 3 and 4 Phidim VDC . The photos below present the asset situation.

Figure 3.5: A view of Phidim town central core.

Figure 3.6: The views of the Phidim town from the south and north.

Figure 3.7: the views of the building clusters as compact settlement within the town core.

Figure 3.8: The sloppy section of the town

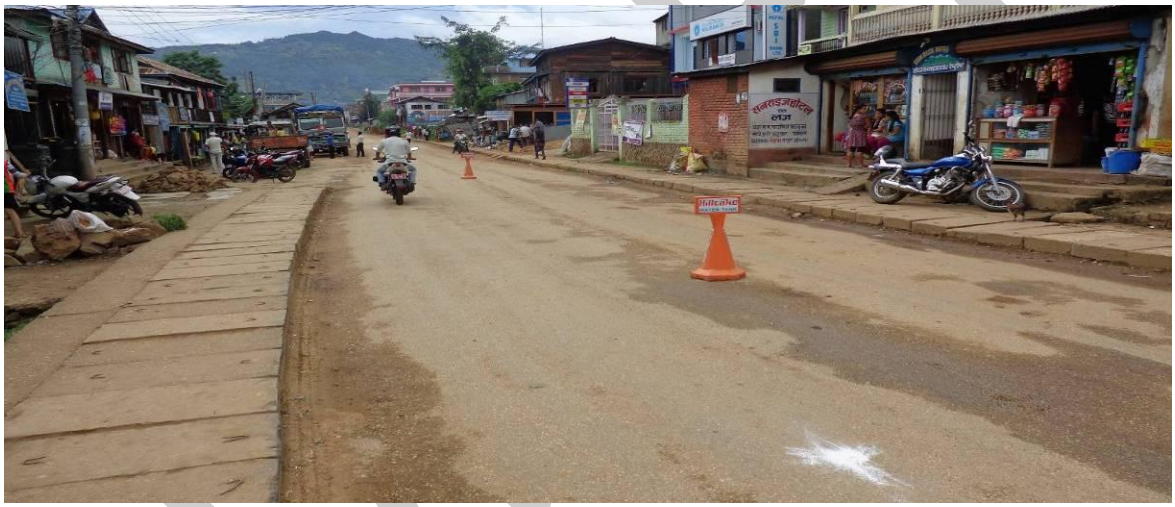


Figure 3.9: The newly constructed road & drains along the Mechi highway passing through he town.

Figure 3.10: The existing condition of the old drains.

3.2.2 Vulnerability assessment

Threat: Increased Intensity of Rainfall

The following threats have been identified as important for the Paachthar residential sanitation system:

- As per the threat profile (see Annexure 1), on an average rainfall intensities will increase by 60%
- Rainfall events occur more frequently than before
- Increased chances of flooding

Exposure: HIGH

The exposure was ranked as high for the following reasons:

- Location: The whole urban core is located along the ridges of the hills characterized by the steep slopes that brings more rainfall in to the town causing flooding issues, and is also exposed to high intensity rainfall zone.
- Duration: Longer duration rainfall events occur more frequently within the asset area
- Intensity: High intensity rainfall occurs more frequently
- Aspect: Steep slopes brings more rainfall runoff to the town

Sensitivity: HIGH

The sensitivity was ranked as high for the following reasons:

- Very poor quality of design and construction of the mixed uses buildings (commercial and residential) without any compliance to the Nepal building code in general, and conditions of the buildings very critical at certain locations.
- Storm drains are not properly designed and constructed within the town. The conditions of the road network need improvement to withstand the intense rainfall conditions.

Impact: HIGH

From the guiding matrix, it can be seen that the impact is HIGH as well. The justification for high impact is as follows:

- The overland flow of water would cause damage to the buildings, drainage and other urban structures.
- Disturbance to the mobility of people and goods.
- Impeding of services delivery resulting economic loss and livelihood opportunities.
- The already landslide prone building structures would face the risk of collapse even with more construction activities going on in the area.
- Injury and Loss of lives, and damages to the property envisaged.

Adaptive Capacity: LOW

The adaptive capacity was ranked as low due to the limited institutional capacity of the newly created Paachthar Municipality and district level government institutions for dealing with the potential disaster events. The newly created Phidim Municipality is so far ineffective.

Vulnerability Scoring: HIGH

As per the below guiding matrix, the vulnerability for the urban core is HIGH.

		Impact				
		Very Low Inconvenience (days)	Low Short disruption to system function (weeks)	Medium Medium term disruption to system function (months)	High Long term damage to system property or function (years)	Very High Loss of life, livelihood or system integrity
Adaptive Capacity	Very Low Very limited institutional capacity and no access to technical or financial resources	Medium	Medium	High	Very High	Very High
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	Very High Exceptional institutional capacity and abundant access to technical and financial resources	Very Low	Low	Low	Medium	High

4 PAACHTHAR DISTRICT VULNERABILITY SUMMARY

4.1 Summary of VA Results

4.1.1 Yasok Market Centre

The table below summarises the vulnerability assessment of the above systems.

YASOK MARKET CENTRE					
THREAT	**EXPOSURE**	**SENSITIVITY**	**IMPACT**	**ADAPTATION CAPCITY**	**VULNERABILITY**
INCREASED TEMPERATURE	HIGH	MEDIUM	HIGH	LOW	**HIGH**

4.1.2 Phidim Central Core Town

The table below summarises the vulnerability assessment of the above systems.

PHIDIM CENTRAL CORE TOWN					
THREAT	**EXPOSURE**	**SENSITIVITY**	**IMPACT**	**ADAPTATION CAPCITY**	**VULNERABILITY**
INCREASED RAINFALL	HIGH	HIGH	HIGH	LOW	**HIGH**

4.2 Most Vulnerable Assets and its Components

Based on the VA performed within Paachthar District, the following conclusions can be made on the assets and their components:

Yasok market Centre

THREAT	DESCRIPTION	IMPACT	WHY IT IS VULNERABLE
Decreased Rainfall and Increased temperature	High temperatures occur more frequently and for longer durations	• Due to the increased temperature and reduced rainfall scenario, urban infrastructure, particularly the buildings with extensive use of CGI sheets would be very uncomfortable to live indoors. The drying-up of water sources adds to deterioration of water supply situation within the buildings and settlements affecting water consumers as well as the agriculture industry. • There is less water available that can cater for daily domestic purposes. Less water means reduced consumption with negative impacts on the living conditions within the settlement with negative impacts on hygiene and sanitation services as well. • Less water for the communities and for agriculture purposes means, the communities might look for alternative living opportunities that might trigger migration.	

Phidim Central Core Town

THREAT	DESCRIPTION	IMPACT	WHY IT IS VULNERABLE
Increased Rainfall	On an average rainfall intensities will increase	Cause damage to the buildings, drainage and other urban structures.	Disturbance to the mobility of people and goods. The already landslide prone building structures would face the risk of collapse even with more construction activities going on in the area. Resulting economic loss and livelihood opportunities.

4.3 Lessons and Application to Other Assets

- The VA assessment aims to address the main issue – achieving increased resilience of Panchthar district's urban assets to climate variability and climate change. The district has both rural and urban settlements that give an opportunity to understand the impacts of CC threats on the rural assets as well.
- A large majority of urban and rural settlements in the mid-hill regions of Nepal are in the similar situation as illustrated by the two short-listed assets. The lessons can be applied to a majority of similarly settlements located at the hilly terrains within the district and

the mid-hill regions of the country. If the Yasok market centre reflect the climate vulnerability arising out of the drought situation, Phidim represent the vulnerability issues and problems related to increased precipitation and frequency in the emerging towns located at the river banks and hilly terrain.

- The VA of the two selected urban assets highlight a need for linking with other sectors – particularly, road & bridge, water supply and sanitation (WATSAN) sectors, and for an integrated strategy, plans and programs to achieve the goals of climate resiliency.
