

**INTEGRATION OF CLIMATE CHANGE AND DISASTER RISK REDUCTION
INTO THE DISTRICT STRATEGIC WASH PLAN
A case study on Myagdi district**

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EXECUTIVE SUMMARY

The impacts of climate change are being felt in Water, Sanitation and Hygiene (WASH) sector. With climate change, disaster risks like flood, landslide and drought are likely to increase affecting water and sanitation facilities. Since climate change has adverse impacts on WASH sector, there is a need to integrate adaptation into climate change, mitigation of climate change and disaster risk reduction into WASH plans. Its integration will be more effective if these key issues are considered in the planning process of WASH plan preparation. A case study on integration of climate change and disaster risk reduction in the District Strategic WASH Plan (DSWASHP) of Myagdi district was done to document the integration process and learn the strengths and weaknesses of the process. Various secondary data were reviewed; district core team (DCT) meetings and District WASH Coordination Committee (DWASHCC) meetings were attended to follow the process. DCT members were interviewed about their experience and challenges faced during the process. Different stakeholders like District Soil Conservation Office, District Forest Office and a local NGO were visited to gather information related to the study.

The DSWASHP preparation process had already been started before conducting this study. Data collection through the use of different formats and the analysis of received data were ongoing. For the integration of climate change (CC) and disaster risk reduction (DRR), format F8 – Climate Uncertainty/Disaster Risk was used for data collection. The sample format was prepared by RWSSP-WN and revised by DCT according to their requirements. Within format F8, different aspects such as vulnerability to risks like landslide, erosion, flood, earthquake, fire hazards, etc., status of improved cooking stoves, ecological sanitation, solar power, micro hydro power and hydro power, perception of water source depletion and existing recharge ponds, WASH situation of trekking routes in the district were included and the data for each aspects were obtained through primary and secondary sources. At the time of finalizing the study, draft DSWASHP report was being prepared which included prioritization of VDCs through combined scoring based on climate specific data as well as other WASH data. This report took into consideration floods, landslides and water source depletion as indicators of climate change risk

since the rankings of VDCs using these indicators were distinct and also they have major impacts on WASH sector.

Active participation of DCT and DWASHCC members in DSWASHP preparation process, CC awareness among stakeholders and the availability of secondary data related to climate uncertainty/disaster risk made the integration process easier. The stakeholders mainly giving inputs in CC and DRR integration process were NRCS, DEU, DCRDC, VDC Secretaries and social mobilizers. Involvement of these stakeholders was useful in providing climate specific data for the integration process. The participation of NGOs working in climate change could have been slightly better during the process. Had they been involved fully in the integration, more inputs on CC and DRR aspects would have been anticipated e.g. more discussions related to CC and DRR in the meetings or contributions towards more climate specific data. In spite of having some challenges, the CC and DRR integration process was appreciated by the stakeholders in DSWASHP preparation. The integration process had been carried out well and considered very useful in bringing up more awareness on CC and DRR among the stakeholders.

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LIST OF ACRONYMS

CAPA: Community Adaptation Plan of Action

DCT: District Core Team

DCRDC: Dhaulagiri Community Resource Development Centre

DDC: District Development Committee

DEO: District Education Office

DEU: District Energy Unit

DPHO: District Public Health Office

DPR: Disaster Preparedness and Response

DTO: District Technical Office

DSWASHP: District Strategic WASH Plan

DWSSDO: District Water Supply and Sanitation Divisional Office

DWASHCC: District WASH Coordination Committee

DWS: Drinking Water Supply

DWSSDO: District Water Supply and Sanitation Division Office

DWASH: District Water, Sanitation and Hygiene

IPCC: Intergovernmental Panel on Climate Change

LAPA: Local Adaptation Plan of Action

MSF: Multi-stakeholders Forum

MSFP: Multi Stakeholder Forestry Programme

MDGs: Millennium Development Goals

NAPA: National Adaptation Programme of Action

NRCS: Nepal Red Cross Society

RWSSP-WN: Rural Water Supply and Sanitation Project in Western Nepal

VDC: Village Development Committee

UNISDR: United Nations International Strategy for Disaster Reduction

UATs: Universal Access Targets

WASH: Water, Sanitation and Hygiene

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1. BACKGROUND

1.1. Climate Change and Disaster Risk Reduction

The Intergovernmental Panel on Climate Change (IPCC¹) defines **climate change** as: “*a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings or to persistent anthropogenic changes in the composition of the atmosphere or in land use*”. Climate change is a very serious topic because of the fact that it poses adverse impacts on different sectors like water resources, agriculture, health, forest and biodiversity. The overall impacts of climate change on water resources are “*too much water and too little water*”, “*wrong type of water*” and “*wrong time of water*” (Thapa, 2010). As a result of climate change, the rainfall pattern is changing. Some areas are receiving high amount of rainfall or *too much water* resulting in floods and landslides whereas some areas are receiving *too little water* resulting in droughts and water scarcity. Such events are making water unsafe due to contamination that is *wrong type of water* which causes different water borne diseases, leading to loss of lives and property. Also there is the *wrong time of water* that is no rainfall when expected and rainfall when least expected.

The impacts of climate change are inevitable. Hence there is a need to address the impacts of climate change with appropriate adaptation and mitigation measures. IPCC defines **climate change mitigation** as “*an anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks*”. Examples of mitigation measures include forest conservation and tree plantation programme, reducing consumption of energy-intensive products, switching

¹ IPCC is a scientific, interdisciplinary body established in 1988 by the World Meteorological Association (WMO) and the United Nations Environment Program (UNEP). Its role is to assess the latest scientific, technical, and socio-economic literature produced worldwide relevant to understanding the risk of human-induced climate change, its observed and projected impacts, and options for adaptation and mitigation.

to renewable forms of energy such as solar power, wind power, etc. While **climate change adaptation** is defined as *“the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities”*. Rainwater harvesting, land stabilization, flood control techniques, pond construction, shifting cultivation, introducing new variety of disease resistant crops, climate change awareness raising, climate induced disaster preparedness, etc. are some of the examples of adaptation measures.

Disaster risk reduction, as defined by United Nations International Strategy for Disaster Reduction (UNISDR²) is *“the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events”*. Climate change and disaster risk reduction are closely linked. More extreme weather events in future are likely to increase the number and scale of disasters, while at the same time, the existing methods and tools of disaster risk reduction provide powerful capacities for adaptation to climate change (UNISDR, 2008). Both climate change adaptation and disaster risk reduction have similar aims of reducing people’s vulnerability to hazards by improving methods to deal with those hazards. Disaster risk reduction deals with various types of hazards like earthquakes, tsunamis, forest fires, etc. including also climate induced hazards such as floods and droughts. In order to be efficient and effective, climate change adaptation policies and measures must build on and expand existing DRR efforts and for DRR approaches to be sustainable, they must account for the impact of climate change (Venton et al., 2008).

² UNISDR is the focal point in the UN system for the coordination of disaster risk reduction and the implementation of the international blueprint for disaster risk reduction - the "Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters".

1.2. District Strategic WASH Plan

Harpe (2011) states a WASH plan as a sectoral plan, which deals with socio-economic, technical, financial, institutional and environmental issues as they pertain to water and sanitation services for a specific local area. It also functions as a management tool towards ensuring universal coverage and sustainable water and sanitation service provision.

According to RWSSP-WN (2011), the District Strategic WASH Plan (DSWASHP) is a plan of the district, which provides the strategic tool and guidelines for the DDC in general and District WASH Coordination Committee (DWASHCC) in particular. The overall objective of DSWASHP is to develop an integrated plan of WASH to achieve district MDGs & UATs in an effective, equitable, efficient, balanced and sustainable water, sanitation and hygiene services at the local level. The rationale for the preparation of DSWASHP by district is as follows:

- District WASH situations and resource gaps are not clearly analyzed and known
- District WASH targets are not clearly identified and agreed
- No clear geographical focus areas agreed on WASH implementation
- Financial resources for WASH are available but their use is not adequately coordinated and optimized
- Comprehensive District WASH strategies are not prepared

1.3. Steps of DSWASH Plan Preparation Process

DSWASHP concept paper of RWSSP-WN (2011) mentions that the DSWASHP preparation process includes five different stages with 15 steps which are as follows:

1. Preparatory Stage
 - i. District core team formation in DWASHCC meeting
 - ii. Preparation of TOR and action plan of district core team
 - iii. Approval of TOR and work plan of district core team

2. Data collection, Analysis and Planning stage
 - iv. Survey existing and secondary data and plan for collecting additional data by secondary and primary sources
 - v. Data collection and digital data management
 - vi. Data analysis
 - vii. Presentation of data analysis in DWASHCC meeting
 - viii. Multi-stakeholders forum workshop to comment on situation and resource analysis
 - ix. Draft DSWASHP report preparation
 - x. Draft DSWASHP presentation in DWASHCC meeting
 - xi. Final DSWASHP report preparation
 - xii. Multi-stakeholders forum meeting to present final DSWASHP
3. Endorsement and Advocacy Stage
4. Implementation Stage
5. Monitoring and Updating stage

The total duration of DSWASHP preparation is estimated to be 3 – 4 months. The steps and stages of DSWASHP preparation is shown in the figure 1:

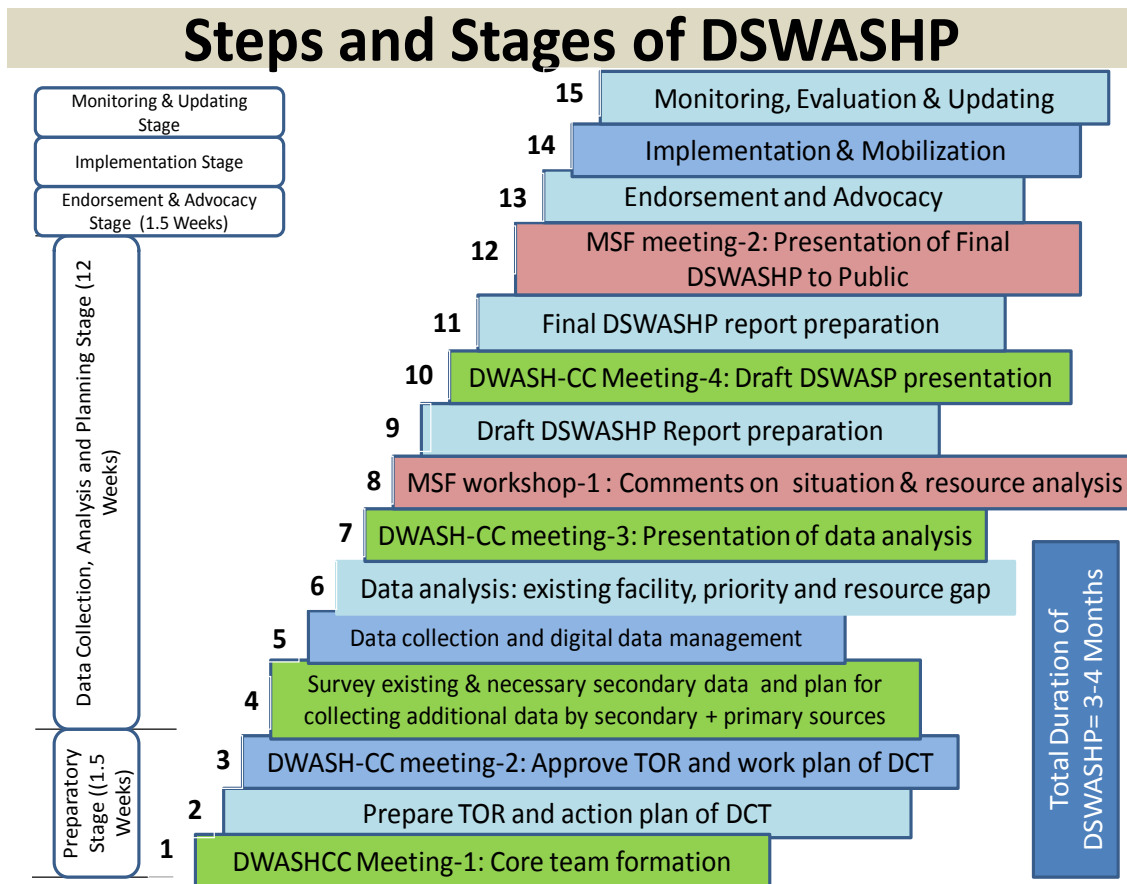


Fig.1 Steps and stages of DSWASHP preparation (Source: DSWASHP Concept Paper)

1.4. Climate Change and Disaster Risk Reduction Integration into DSWASHP

There has been increasing recognition that development plans, policies and programs need to consider the impacts of climate change and disaster risk reduction to ensure they produce successful outcomes. **Mainstreaming** is now being used as an approach to provide a framework to implement adaptation. It implies that awareness of climate change impacts and associated measures to address these impacts are integrated into existing and future development policies and plans of developing countries, as well as multilateral institutions, donor agencies and NGOs (Calow et al., 2011). The Hyogo Framework for Action (HFA³) identifies the specific need to

³ The Hyogo Framework of Action (HFA) is a 10-year plan (2005 – 2015) endorsed by the UN General Assembly to make the world safer from natural hazards. Its goal is to substantially reduce disaster losses by 2015 by building the resilience of nations and communities to disasters.

“promote the integration of risk reduction associated with existing climate variability and future climate change into strategies for the reduction of disaster risk and adaptation to climate change”.

Developing countries like Nepal which is highly vulnerable to the impacts of climate change and natural disasters should well integrate these issues i.e. climate change and disaster risk reduction into the planning process of any development work.

The impacts of climate change are being felt in WASH sector. With climate change, drought-affected areas are likely to become more widely distributed affecting water availability. The frequency of heavy precipitation is likely to increase in some areas leading to greater flood and landslide risks. Floods and landslides can adversely affect water and sanitation facilities by causing overflows or damaging the structures and thereby increasing greater health risks from water-borne diseases. Climate change and disaster risk reduction are linked closely. Since climate change has adverse impacts in WASH sector and disaster risk reduction helps in reducing different types of hazards in which some are climate change induced like floods, landslides and drought; there is a strong need to integrate climate change and disaster risk reduction into the WASH plan. The integration is likely to be more effective if these key issues are considered as early as possible in the planning process of WASH plan preparation.

RWSSP-WN considers climate change as one of the crosscutting issues in its WASH program interventions and has introduced the climate change aspects into district strategic WASH planning process. Currently, RWSSP-WN is supporting all nine districts in DSWASHP preparation. Among them, the DSWASHP of Myagdi district is being prepared by DWASHCC with the support of DDC and RWSSP-WN and has integrated climate change aspects and disaster risk reduction into it.

1.5. Introduction of Myagdi District

Myagdi district lies in the mid-hills of Western Development Region, in Dhaulagiri Zone. To the east is Kaski, Parbat and Manang districts, to the west is Baglung and Rukum districts while in the north is Mustang and Dolpa district and in the south is Baglung district. It is situated at 28° 20' to 28° 47' N latitude and 83° 08' to 83° 53' E longitude with maximum height of 8167 m (Mt Dhaulagiri) above sea level and minimum height of 792 m (Ratnechaur VDC) above sea level. This district has a total area of 2,297.06 km². The district headquarter is in Beni. There are 41 VDCs with 369 wards in this district. It has a total population of 113,641 with 51,395 males and 62,246 females and total households of 27,762 including the institutional households (CBS, 2011).

Myagdi district is rich in natural resources; the major rivers in this district are Kali Gandaki, Myagdi Khola and Raghu Ganga and its tributaries like Kaag Khola, Bokshi Khola, Begh Khola, Gurja Khola, Marang Khola, etc. There are hot springs in this area; Bhurung Tatopani, Singa Tatopani and Dagnam Tatopani. The world's deepest gorge, Kali Gandaki Gorge (Aandha Galchi) which is 6967 m deep lies in the Dana VDC of this district. It is also one of the most popular destinations for tourism. The world famous Poon Hill lies in the Shikha VDC of this district. Ghorepani is another attraction for travelers. Annapurna conservation area project (ACAP) lies in Narchyang, Ghara and Sikha VDCs of this district and Dhorpatan Hunting Reserve also lies in this district. The flora and fauna of this district is unique. Not only in natural resources, Myagdi district is also rich in cultural heritage. Magars are the main inhabitants of this district while other castes like Brahmin, Chettri, Thakuri, Newar, Gurung, Giri, Sarki, Kami, Damai, Thakali, Chyanyal, etc are also dwelling in this area. (District Development Plan, 2068/69 B.S.)

Geographically, Myagdi district lies on the hilly area. Most of the area of this district is covered with steep slopes, rivers, streams, mountains, huge rocks, etc. Dwelling places and cultivable land lie within these areas. So during monsoon, these places are in the risk of floods and landslides. Highly variable climate and geographical areas, unorganized dwelling places, etc. make the community in this district on high risk of hazards. Epidemics, fires, drought, hailstone,

snowfall, storms, intense and scarce rainfall due to climate change, etc. are some of the major problems faced by this district. Loss of lives and property are mainly due to heavy rainfall leading to floods and landslides while hailstone, snowfall, fires are also the other causes of losses that occurs frequently in this district (DPR Plan, 2068). Hence, there is a need to effectively integrate these issues into any developmental plans or programs of the district to reduce the impacts of these disasters.

2. OBJECTIVE OF THE STUDY

The main objective of the study was to document the process how climate change and disaster risk reduction are integrated in practice into the Myagdi DSWASH planning process. The study recorded the relevant climate change related aspects, discussions, experiences of the DSWASHP core team members and provided process description on climate change and disaster risk reduction integration into DSWASHP.

3. METHODOLOGY

The following methodologies were followed in the study:

- Various secondary data like reports and websites were reviewed to gain an understanding about the WASH plan, its planning process, climate change and disaster risk reduction, etc.
- The fifth and sixth District core team (DCT) meetings as well as the second DWASHCC meeting were attended to record the integration process of climate change (CC) and disaster risk reduction (DRR) in DSWASHP of Myagdi district and the discussions related to CC and DRR.
- Different stakeholders like District Soil Conservation Office, District Forest Office and a local NGO – MILAN (Multi Disciplinary Institute for Livelihood Enhancement and Natural Resource Management) were visited to gather information related to the study.

- Discussions with the district core team (DCT) members about their experience and challenges faced during the planning process.

Preparation of DSWASHP had already been started before the beginning of this study. Preparatory stage (as shown in Fig. 1) had already been carried out and it involved district core team (DCT) formation, preparation of ToR and action plan of DCT and its approval. Data collection through the use of different formats was ongoing and most of the data had been received. Also, the analysis of collected data was ongoing. So, the steps 5, 6 and 7 (Fig. 1) were being observed at the time of study. Some of the activities mentioned in the following chapters are based on the minutes of the DCT meeting and DWASHCC meeting. Three meetings; the fifth and sixth DCT meetings and the second DWASHCC meeting were attended for process documentation of the study. Due to time constraint, it was not possible to follow the process fully till the end. So the steps 8 to 15 (Fig. 1) which involved multi-stakeholder forum (MSF) workshop, draft DSWASHP report preparation and presentation, final DSWASHP report preparation and presentation, endorsement and advocacy, implementation and mobilization and monitoring evaluation and updating were not observed during the study. At the time of finalizing the study, multi-stakeholder forum (MSF) workshop was being planned and the draft DSWASHP report preparation was ongoing. However, the CC and DRR related data collection and analysis for DSWASHP was already completed and this data was used to describe the outcome of the integration process.

4. INTEGRATION OF CLIMATE CHANGE AND DISASTER RISK REDUCTION INTO DSWASHP OF MYAGDI DISTRICT

4.1 District Core Team Formation

District core team (DCT) was formed on 5th January 2013 for DSWASHP preparation of Myagdi district. This included seven members from different sectors like District Development Committee (DDC), District Water Supply and Sanitation Division Office (DWSSDO), District Public Health Office (DPHO), District Education Office (DEO), Civil Society, Nepal Red Cross Society (NRCS) and District Technical Office (DTO). These members had knowledge on climate change and disaster risk reduction. Integration of climate change and disaster risk reduction was initiated in DCT meeting and after discussions within the team it was decided to integrate them into DSWASHP. Different sample formats for data collection F1 – F9 prepared by RWSSP-WN were revised and finalized by DCT according to the district’s needs. Among these formats, the format F8 was used for collecting climate uncertainty /disaster risk data. The different formats used for WASH related data collection along with the organizations responsible for data collection were as follows:

Table 1: Different formats and the organizations responsible for data collection

Code	Format Name	Responsible organizations for data collection
F1	School WASH	DEO
F2	Other Institutional WASH	SUAAHARA project and DDC
F3	VDCs Stakeholders Mapping	VDCs secretaries and social mobilizers
F4	District WASH Stakeholders Investment Mapping	NRCS
F5	District Stakeholders Plan Mapping	NRCS
F6	Remoteness/Distance Mapping	DTO
F7	Incidence of water borne diseases	DPHO
F8	Climate Uncertainty/Disaster Risk	DDC and others
F9	District DWS Inventory	DWASH unit

4.2 CC and DRR Data Collection Process

In the DCT meetings, there were discussions on how the data for F8 format about climate uncertainty and disaster risk would be collected. Within format F8, it was decided that the following aspects would be included and the data for each aspects would be obtained through primary and secondary sources:

1. Vulnerability to Landslide, Erosion, Flooding, Earthquake, Fire Hazards, Storm, Thunderstorm, Snowing (based on 10 years data):

These data would be obtained from secondary source – Disaster Preparedness and Response (DPR) Plan of Myagdi district, 2068 which was prepared by DDC office and Nepal Red Cross Society of Myagdi district.

2. Status of Improved Cooking Stoves and Ecological Sanitation in the district

These data would be obtained from District Energy Unit (DEU) and Dhaulagiri Community Resource Development Center (DCRDC).

3. Perception of Water Source Depletion and Existing Recharge Ponds

These data would be obtained from VDC secretary and social mobilizers in the village.

4. WASH Situation of Trekking Routes

Secondary source - Tourism Master Plan data would be used to get the information about WASH situation of trekking routes.

5. Solar Power, Micro Hydro Power and Hydro Power in the district

These data would be obtained from DEU and DCRDC.

Format for perception of water source depletion and existing recharge pond was distributed to respective VDC secretaries for data collection. Other required data in F8 format was collected from the secondary sources. Format F8, including the sample forms for specific data is attached in annex 1.

The chairman of NRCS, Mr. Lekh Bahadur Hamal mentioned that during the preparation of DPR Plan a specific format was prepared for recording vulnerability to landslide, erosion, flooding, earthquake, fire hazards, storm, thunderstorm and snowing. This format was distributed to all

VDC's secretaries. The ranking of these risks were done by respective VDC secretaries based on their perception, with ranking starting from 1 to 8, 1 for very high risk and 8 for very low risk. For example: according to the VDC secretary, for Arman VDC landslide was of very high risk so it was given rank 1, the second highest risk was flood which was given rank 2, fire was given rank 3, thunderstorm-rank 4, storm-rank 5, epidemics-rank 6, earthquake-rank 7 and snowing was given rank 8 with very low risk. In this way, the vulnerability to landslide, erosion, flooding, earthquake, fire hazards, storm, thunderstorm and snowing for each VDC was obtained; the table for this is attached as annex 2. The analysis of these risks of VDCs showed that VDCs such as Arthunge, Babiyachaur, Chimkhola, Dana, etc were on high risk of flood and Arman, Baranja, Bhakimli, Bim, etc. were on high risk of landslides.

4.3 CC and DRR Discussion in DCT Meetings

There were discussions related to CC and DRR in different meetings held for DSWASHP preparation. Since, the planning process had already been started and this study was completed slightly before the end of the process, not all the CC and DRR related discussions were observed. Some discussions related to CC and DRR during the DCT meetings that were attended have been mentioned in this study. In these meetings, Local Development Officer (LDO) and Chief District Officer (CDO) of Myagdi had participated and discussed actively on the CC and DRR aspects. In the **fifth DCT Meeting**, conducted on 16th March 2013, there was discussion on the following topics related to climate change and its impacts in the district:

➤ **Climate change and water source depletion:**

The members in the meeting discussed that as a result of climate change, its impact such as water source depletion was being observed in the Myagdi district. Most of the VDCs have ponds in their areas but these were drying. One of the member mentioned that the government of Nepal has decided to implement 1 VDC 1 recharge pond concept/program in every VDCs to protect the drying water sources. Roadside tree plantation would be helpful in preventing landslides and mitigating the impacts of climate change.

In the **sixth DCT Meeting** the review of work progress was done and some of the analyzed data were presented. The following finding was obtained for climate uncertainty/disaster risks:

- **F8 data on water source depletion and existing recharge ponds** showed that there were altogether 273 ponds in the district with the highest number of ponds (35) in Ratnechaur VDC. 71 water sources in the district were depleting which was observed in 22 VDCs and the highest number of ponds (16) drying in Piple VDC.

4.4 Observations during CC and DRR Integration Process

Climate change (CC) and disaster risk reduction (DRR) integration in DSWASHP was initiated by the DCT members in the meeting. Realizing its importance, they decided to integrate CC and DRR into DSWASHP of Myagdi district. The DCT members were aware of the concept of climate change and its impacts. According to them, climate change is one of the challenging issues of today's world which has major implications in WASH sector. As a result of climate change, floods and landslides are increasing which are damaging water schemes and thus affecting water supply, sanitation and hygiene. Spring sources are drying up and leading to water scarcity and drought. These impacts are being observed in Myagdi district. This district is already on high risk of floods and landslides; climate change is exacerbating these risks. So the DCT members felt a strong need to address climate change and disaster risk reduction in the DSWASHP and effectively integrate these issues into the process and DSWASH plan.

According to the team members, the steps 4, 5 and 6 (fig.1) in DSWASHP preparation process were the most important steps in terms of CC and DRR inclusion. The step 4 included surveys of necessary secondary data and planning for primary data collection and step 5 involved data collection and digital data management. During these steps the relevant CC data was collected from primary as well as secondary data sources. Analysis of the collected data, step 6 would be useful in prioritizing the VDCs' in terms of climate change vulnerability and disaster risks and thus implementing WASH programs according to the DSWASHP in the prioritized VDCs.

District soil conservation and district forest offices were visited to obtain information about its activities in climate change adaptation and mitigation and disaster risk reduction. District soil conservation officer mentioned that the various activities like roadside plantation and conservation of trees, bio-engineering techniques, etc. have been implemented in the district to reduce the risk of disaster such as landslides. He expressed that due to deforestation and climate change the spring sources in the district have been drying. Hence there is a need to protect these water sources by applying various techniques such as tree plantation and recharge pond construction. He indicated that not much study has been done regarding the drying water sources in the district.

District forest officer mentioned that the district forest office has been actively involved in forest conservation and management through participatory approach. Both public and private tree plantation programmes have been done in the district. Various climate change awareness raising, mitigation and adaptation plans have been implemented, especially community based adaptation plans are being implemented through community forests' users group in the district. Recently, Multi Stakeholder Forestry Programme (MSFP) has been launched in the district to improve livelihoods and resilience of poor and disadvantaged people. The ten-year Multi Stakeholder Forestry Programme is designed through a multi-stakeholder process to contribute to poverty reduction and tackling climate change in Nepal.

There were some organizations in the district which were working in the field of climate change such as MILAN (Multi Disciplinary Institute for Livelihood Enhancement and Natural Resource Management), HIMAWANTI-Nepal (Himalayan Grassroots Women's Natural Resource Management Association) and HRDC (Hilly Resource Development Centre). These organizations were involved in climate change awareness raising in different VDCs, preparation of CAPAs for VDCs, floods and landslides protection measures in VDCs, etc.

4.5 Experiences of DCT Members during CC and DRR Integration Process

The experience of DCT members in DSWASHP preparation was good so far, as they had been actively involved in the preparation of DSWASHP. According to DCT members, the past data and records showed only incremental coverage of drinking water supply in the district not the actual situation of drinking water supply. So, DCT members were hopeful that this DSWASH Plan would present the actual WASH situation, identify the resource gaps and thereby help in implementing WASH program in the prioritized VDCs of the district.

Multiple stakeholders were involved in the DSWASHP preparation process, so there were some challenges in coordinating all of them. Also some challenges were observed during the data collection process regarding the participation of VDC personnel. Despite some challenges, the integration of CC and DRR into DSWASHP was taken very positively by all the DCT members and stakeholders. The integration process had been very useful in bringing up awareness among the stakeholders. According to the DCT members, the use of DPR Plan of Myagdi district which was prepared by NRCS and DDC made the integration process easier. The assessment of water source depletion and existing recharge ponds in the district, made them aware of the situation of water sources in each VDC and triggered discussion more on climate change and its impacts on water resources.

4.6 Outcome of CC and DRR Integration Process

At the time of finalizing this study, the draft DSWASHP report was being prepared. The draft report included prioritization of VDCs through combined scoring based on climate specific data as well as other WASH data. In the draft report the climate change related ranking of the VDCs took into consideration floods, landslides and water source depletion as indicators of climate change risk. At first, the CC ranking was tried to be done based on more extensive selection of CC indicators but the approach was not found to be effective due to too small differences between the VDC scores. Therefore, the most relevant indicators, floods, landslides and water source depletion, were selected and the ranking was done based on them. The scoring of different risks in the DPR Plan was modified so that the score 1 was for low risk and 5 for high

risk. This was done in order to have compatible scoring with other indicators. Ten VDCs like Piple, Pulachaur, Darbang, etc. were on high climate change risk while four VDCs like Gurja, Jhin, Kuhun and Histan were on low risk (as shown in figure in annex 2). Through combined scoring with other WASH data, the priority VDCs of Myagdi for WASH intervention were obtained. Based on this Dowa VDC came in first rank (as shown in figure in annex 3).

The budget projection for DSWASHP (2013 – 2017) was done which presented among others the parts of the budget for preparation and updating LAPA and CAPA as well as the implementation of climate change adaptation measures like implementation and promotion of ICS, source conservation, promotion of recharge ponds, etc. For example, for the preparation of district LAPA Rs 250,000 and promotion of recharge pond Rs 8,200,000 were allocated.

All the collected CC and DRR related data is presented in the draft report even though only data on floods, landslides and water source depletion was used in the prioritization process. The additional data collected through the format 8 will provide basis for a more comprehensive CC and DRR approach for the district WASH program. The data gives a good overall picture about CC and DRR aspects related to WASH sector. This data can be used for planning and promoting interventions on improved cooking stoves, biogas, recharge ponds etc. Based on the data it is easier to coordinate CC related activities, allocate resources and make long-term planning. The data can be used also in adaptation planning such as LAPA and CAPA preparation processes.

5. STAKEHOLDERS INVOLVED AND THEIR ROLE IN INTEGRATION PROCESS

Each of the stakeholders has an essential part to play in successfully scaling-up WASH, improving performance and ensuring the sustainability of program results. The stakeholders involved in DSWASHP preparation in Myagdi district and their roles and responsibility are discussed below in the table 2. This table is a modified version: some of the roles of stakeholders mentioned have been taken from the District WASH structure (RWSSP-WN, 2009) and CC and DRR related aspects have been added according to the situation in the Myagdi district.

Table 2: Stakeholders involved in DSWASHP preparation and their roles & involvement in integration process

Stakeholders involved in DSWASHP preparation	Their roles and involvement in CC and DRR integration process
<p>Government line agencies:</p> <ul style="list-style-type: none"> • District Development Committee (DDC)/ RWSSP-WN • District WASH Coordination Committee (DWASHCC) • District Water Supply and Sanitation Division Office (DWSSDO) • District Technical Office (DTO) • District Education Office (DEO) 	<ul style="list-style-type: none"> ➤ Overall management of the WASH at the district level ➤ Facilitating, coordinating and directing district WASH stakeholders in DSWASHP preparation ➤ Ensure the timely availability of the budget to DSWASHP preparation ➤ Chair DWASHCC meetings ➤ Mainly responsible for DSWASHP preparation/ leading authority in DSWASHP preparation ➤ Create an environment for facilitation, coordination and support among all WASH stakeholders ➤ Support the development and implementation of DSWASHP ➤ Play an effective role in developing monthly work plan, implementation and work distribution in DSWASHP process through DWASHCC meeting ➤ Technical support in infrastructural development works under DDC funding ➤ Provide assistance in surveys of water schemes in the district for DSWASHP data collection ➤ Facilitate the assessment of school WASH situation and provide school WASH data in DSWASHP preparation ➤ Supporting schools, teachers, students, students' clubs, school management committee, etc in implementing WASH activities

Stakeholders involved in DSWASHP preparation	Roles and responsibilities of stakeholders
<ul style="list-style-type: none"> • District Public Health Office (DPHO) 	<ul style="list-style-type: none"> ➤ Ensure WASH facilities in all organizations working under DPHO ➤ Provide relevant data on water and sanitation related diseases in DSWASHP preparation
<ul style="list-style-type: none"> • Village Development Committee (VDC) 	<ul style="list-style-type: none"> ➤ Facilitation, implementation and coordination of VDC level WASH activities ➤ Providing other institutional data and climate uncertainty/disaster risk data – source depletion and existing recharge pond situation DSWASHP preparation
<ul style="list-style-type: none"> • District Energy Unit 	<ul style="list-style-type: none"> ➤ Providing secondary data on the status of solar, micro-hydro power, hydro power and bio-gas in the district for DSWASHP preparation
NGOs, INGOs and Private sectors:	
<ul style="list-style-type: none"> • Nepal Red Cross Society (NRCS) 	<ul style="list-style-type: none"> ➤ Providing district WASH stakeholders mapping and district WASH stakeholders plan mapping data ➤ Providing secondary data on each VDC’s vulnerability to different types of risks such flood, landslides, thunderstorm, etc. through the DPR Plan prepared by it
<ul style="list-style-type: none"> • Civil society 	<ul style="list-style-type: none"> ➤ Facilitate in the school WASH data collection ➤ Support and coordinate in DSWASHP preparation
<ul style="list-style-type: none"> • SUAAHARA Project 	<ul style="list-style-type: none"> ➤ Budget contribution ➤ Facilitate in DSWASHP preparation
<ul style="list-style-type: none"> • Dhaulagiri Community Resource Development Center (DCRDC) 	<ul style="list-style-type: none"> ➤ Provide secondary data on the status of improved cooking stoves and bio-gas in the district for DSWASHP preparation

The stakeholders mainly giving inputs in CC and DRR integration process were NRCS, DEU and DCRDC by providing secondary data and VDC Secretaries and social mobilizers by providing primary data on water source depletion and existing recharge ponds in the VDCs. Involvement of these stakeholders in DSWASHP preparation was useful in providing climate specific data for the integration process.

Others Stakeholders in DSWASHP:

- District Forest Office (DFO), District Soil Conservation Office (DSCO), District Agricultural Development Office (DADO), Women and Children Development Office, etc.
- Kadoorie Agricultural Aid Association (KAAA), Gurkha Welfare Scheme (GWS), Bhimpokhara Yuwa Club (BYC), etc.
- Private sectors like Federation of Nepal Chamber of Commerce (FNCC), Annapurna Conservation Area Project (ACAP), etc.

6. CONCLUSIONS

A case study on the integration of climate change and disaster risk reduction into the DSWASH plan of Myagdi district was done to document the integration process and learn the strengths and weaknesses of the process. Based on this study, the following conclusions were made:

- Active participation of DCT and DWASHCC members in DSWASHP preparation process made the integration of climate change and disaster risk reduction easier. Although the DSWASHP involved multiple stakeholders, not all the stakeholders could be involved in the preparation process or within the DCT. But the integration process was taken positively by all the stakeholders and those involved carried out the integration process well.
- The stakeholders involved in DSWASHP preparation were aware about climate change and its impacts on WASH sector. CC awareness among the stakeholders and the availability of secondary data relevant to climate change and disaster risk reduction were very useful in the integration process.
- Easy identification of secondary data and its use in DSWASHP preparation process shows the multiple stakeholders' active involvement in the process. However, some stakeholders during the data collection were not very actively engaged in the process. This was reflected in the data provided by them which had some errors. Such errors were rectified during data entry, analysis and presentation.
- Some of the climate specific data used in the DSWASHP were qualitative data as there was lack of proper recording system or specific organization to provide these data. Due to lack of secondary data on water source depletion and existing recharge pond status in the district, primary data was collected which involved an assessment on water source depletion and recharge pond based on the perception of VDC secretaries and social mobilizers. Such bottom-up data can serve as baseline data and represent the local climate-related vulnerabilities and perception on impacts.
- Downscaled climate projection data for the district was not utilized during the integration process because of difficulty in obtaining the required data for all the VDCs in the district.

Also the community based adaptation plans prepared by community forest users' group in different VDCs were not used during the integration as these were specific to forestry sector.

- The stakeholders mainly giving inputs in CC and DRR integration process were NRCS, DEU, DCRDC, VDC Secretaries and social mobilizers. Involvement of these stakeholders in DSWASHP preparation was crucial in providing climate specific data for the integration process. The participation of NGOs working in the field of climate change could have been stronger. Had they been involved in the integration, more inputs on climate change and disaster risk reduction would have been anticipated. Their involvement would have raised more discussions related to CC and DRR in the meetings and provided more climate specific data or more reliable data such as downscaled climate data, etc.
- In order to prioritize the VDCs based on the CC related aspects, the data on floods, landslides and water source depletion was utilized. The CC risk data was combined with other WASH data and final prioritization of VDCs was conducted. Additional CC and DRR related data was documented in the draft report and it can be applied for various WASH and adaptation planning purposes. In this way the coordination, resource allocation and integrated climate change approach can be improved in the whole district as a result of DWASH planning process.
- In spite of having some challenges, the CC and DRR integration into DSWASHP was appreciated by the stakeholders. The integration process had been very useful in bringing up more awareness on CC and DRR among the stakeholders. The stakeholders were hopeful that the DSWASH Plan of Myagdi district would present the actual WASH situations, identify the resource gaps and thereby help in implementing WASH programs in the prioritized VDCs of the district.

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ANNEX 1

F8- Format for Climate Uncertainty/ Disaster Risks (Sample forms: 1, 2A and B, 3, 4, 5)

1. Sample form on Vulnerability to Flood, Landslide, Fire, Epidemic, Earthquake, Storm, Thunderstorm and Snowing

S N	VDC	Vulnerability/ Risk Ranking (1 Very high- 8 Very Low)							
		Flood	Landslide	Fire	Epidemic	Earthquake	Storm	Thunderstorm	Snowing
1	Arman								
2	Arthunge								
3	Babiyachour								
4	Baranja								
5	Begkhola								
6	Bhakimli								
7	Bim								
8	Chimkhola								
9	Dagnam								
10	Dana								
11	Darbang								
12	Devisthan								
13	Ghatan								
14	Dowa								
15	Gurja								
16	Histan								
17	Jhin								
18	Jyamrukkot								
19	Kunhun								
20	Kuinemangale								
21	Lulang								
22	Malkabang								
23	Marang								
24	Mudi								
25	Muna								
26	Narchyang								
27	Niskot								
28	Okharbot								
29	Pakhapani								
30	Patleket								
31	Pulachour								
32	Bhagawati								
33	Piple								
34	Ramche								
35	Ratnechour								
36	Ruma								
37	Shikha								
38	Singa								
39	Takam								
40	Bhurung Tatopani								
41	Ghar								

2. A) Sample form on Status of Improved Cooking Stoves in the district

SN	VDC	Status	
		Hhs having ICS	Is the VDC declared as in-house Smokeless VDC? (Yes / No)
1	Arman		
2	Arhunge		
3	Babiyachour		
4	Baranja		
5	Begkhola		
6	Bhakimli		
7	Bim		
8	Chimkhola		
9	Dagnam		
10	Dana		
11	Darbang		
12	Devisthan		
13	Ghatan		
14	Dowa		
15	Gurja		
16	Histan		
17	Jhin		
18	Jyamrukkot		
19	Kunhun		
20	Kuinemangale		
21	Lulang		
22	Malkabang		
23	Marang		
24	Mudi		
25	Muna		
26	Narchyang		
27	Niskot		
28	Okharbot		
29	Pakhapani		
30	Patlekhhet		
31	Pulachour		
32	Bhagawati		
33	Piple		
34	Ramche		
35	Ratnechour		
36	Ruma		
37	Shikha		
38	Singa		
39	Takam		
40	Bhurung Tatopani		
41	Ghar		

2. B) Sample form on Status of Ecological Sanitation in the district

SN	VDC	Status		
		Hhs having Urine Diversion Toilets	HHs using urine as fertilizer	Nos. of Institutions having UDTs/Biogas
1	Arman			
2	Arthunge			
3	Babiyachour			
4	Baranja			
5	Begkhola			
6	Bhakimli			
7	Bim			
8	Chimkhola			
9	Dagnam			
10	Dana			
11	Darbang			
12	Devisthan			
13	Ghatan			
14	Dowa			
15	Gurja			
16	Histan			
17	Jhin			
18	Jyamrukkot			
19	Kunhun			
20	Kuinemangale			
21	Lulang			
22	Malkabang			
23	Marang			
24	Mudi			
25	Muna			
26	Narchyang			
27	Niskot			
28	Okharbot			
29	Pakhapani			
30	Patlekheth			
31	Pulachour			
32	Bhagawati			
33	Piple			
34	Ramche			
35	Ratnechour			
36	Ruma			
37	Shikha			
38	Singa			
39	Takam			
40	Bhurung Tatopani			
41	Ghar			

3. Sample form on Perception of Water Source Depletion and Existing Recharge Ponds

SN	VDC	Status		
		Nos. of Water Sources depleted	Nos. of Recharge ponds	Other Noticeable Impacts on Water Sources
1	Arman			
2	Arthunge			
3	Babiyachour			
4	Baranja			
5	Begkhola			
6	Bhakimli			
7	Bim			
8	Chimkhola			
9	Dagnam			
10	Dana			
11	Darbang			
12	Devisthan			
13	Ghatan			
14	Dowa			
15	Gurja			
16	Histan			
17	Jhin			
18	Jyamrukkot			
19	Kunhun			
20	Kuinemangale			
21	Lulang			
22	Malkabang			
23	Marang			
24	Mudi			
25	Muna			
26	Narchyang			
27	Niskot			
28	Okharbot			
29	Pakhapani			
30	Patlekheth			
31	Pulachour			
32	Bhagawati			
33	Piple			
34	Ramche			
35	Ratnechour			
36	Ruma			
37	Shikha			
38	Singa			
39	Takam			
40	Bhurung Tatopani			
41	Ghar			

4. Sample form on WASH Situation of Trekking Routes

SN	Name of the Trekking Routes	Major areas passing through	Nos. of Public Toilets in the route	Nos. of Potential sites of toilets	Nos. of public water points	Nos. of solid waste points
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						

5. Sample form on Solar Power, Hydro Power and Micro Hydro Power in the District

Solar Power

S.No.	Date of Installation(A.D.)	Installed No.	Installed Capacity(Watt)
1			
2			
3			
4			
5			
Total			

Hydro power

S.No.	Name of Owner / Schemes	VDC/Village	Cap. (KW)	Support Organisation	Remarks
1					
2					
3					
4					

Micro Hydro power

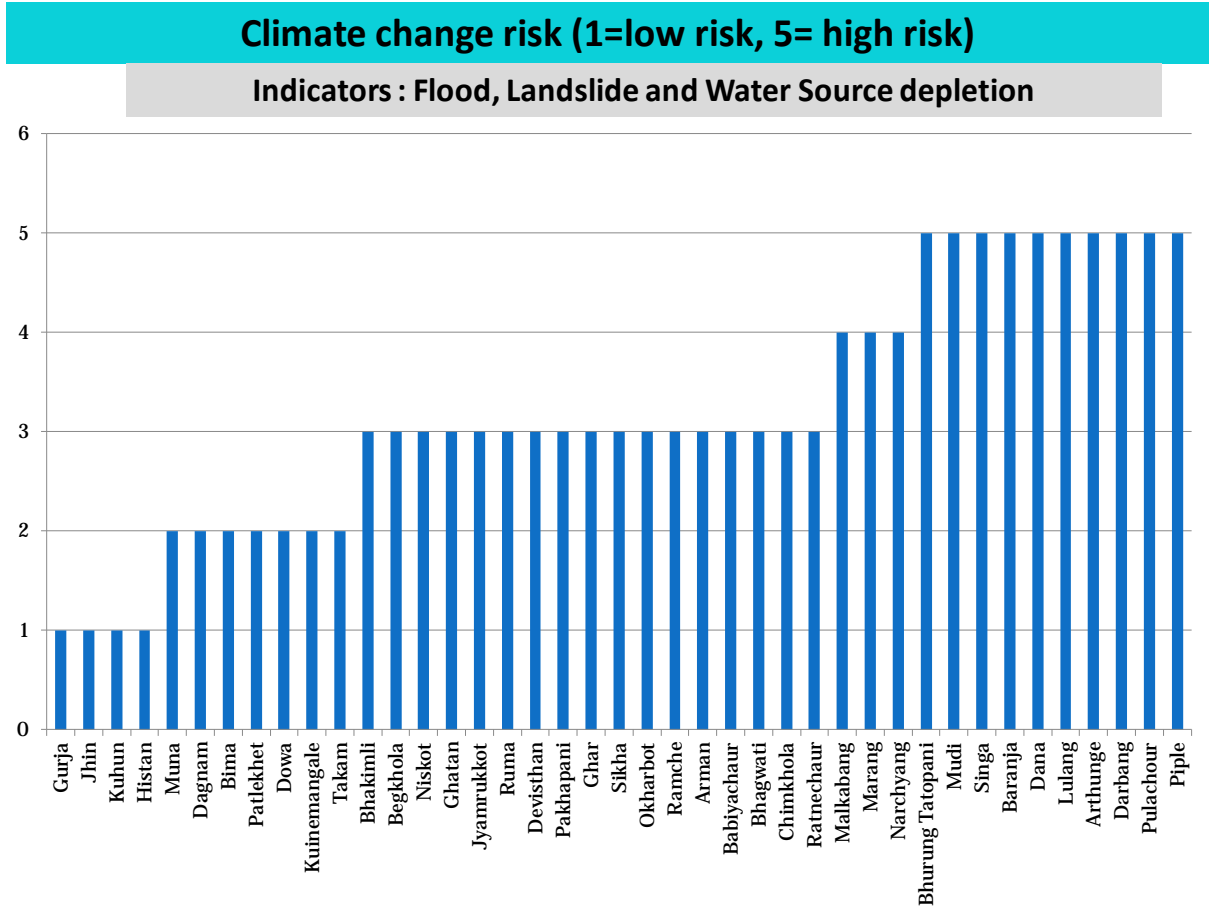
S.No.	Name of VDC	No. of Diesel Mill	Installation (time period)	Water Mill (WM)+Electric Mill(EM)
1				
2				
3				

ANNEX 2

Ranking of VDCs based on vulnerability to flood, landslide, fire, epidemic, earthquake, storm, thunderstorm and snowing (DPR Plan of Myagdi district)

SN	VDC	Vulnerability/ Risk Ranking (1 Very high- 8 Very Low)							
		Flood	Landslide	Fire	Epidemic	Earthquake	Storm	Thunderstorm	Snowing
1	Arman	2	1	3	6	7	5	4	8
2	Arthunge	1	2	3	4	5			
3	Babiyachour	1	2	3	5	8	4	6	7
4	Baranja	2	1	3	5	7	6	4	8
5	Begkhola	3	2	4	7	8	1	6	5
6	Bhakimli	3	1	2	7	8	5	4	6
7	Bim	5	1	2	6	7	3	4	8
8	Chimkhola	1	2	5	7	8	4	3	6
9	Dagnam		1	4	6	7	3	2	5
10	Dana	1	2	4			3	5	
11	Darbang	1	2	4				3	5
12	Devisthan	5	1	4			2	3	
13	Ghatan	2	1	3				4	
14	Dowa		1	2			4	3	
15	Gurja		2	3				4	1
16	Histan		1	3				2	
17	Jhin		1	2			3		
18	Jyamrukkot	2	1	3				4	
19	Kunhun		2	3				1	
20	Kuinemangale		1	3	4				5
21	Lulang	1	2	3				4	
22	Malkabang	2	1	3					4
23	Marang	2	1	3					
24	Mudi	2	1	4					3
25	Muna	4	1	3				2	
26	Narchyang	3	2	4			1		
27	Niskot	2	1	3			5	4	
28	Okharbot	2	1	3			5	4	
29	Pakhapani		1	3			2	4	
30	Patlekhhet		1	3			4	2	
31	Pulachour	2	1	4				3	
32	Bhagawati	3	1	2				4	
33	Piple	2	1	3					
34	Ramche		1	4			3	2	
35	Ratnechour	1	2	3				4	
36	Ruma	2	1	4				3	
37	Shikha		1				2	3	
38	Singa	1	2	3			4		
39	Takam		1	4	2			3	
40	Bhurung Tatopani	2	1	3			4		
41	Ghar	2	1				3		4

ANNEX 3



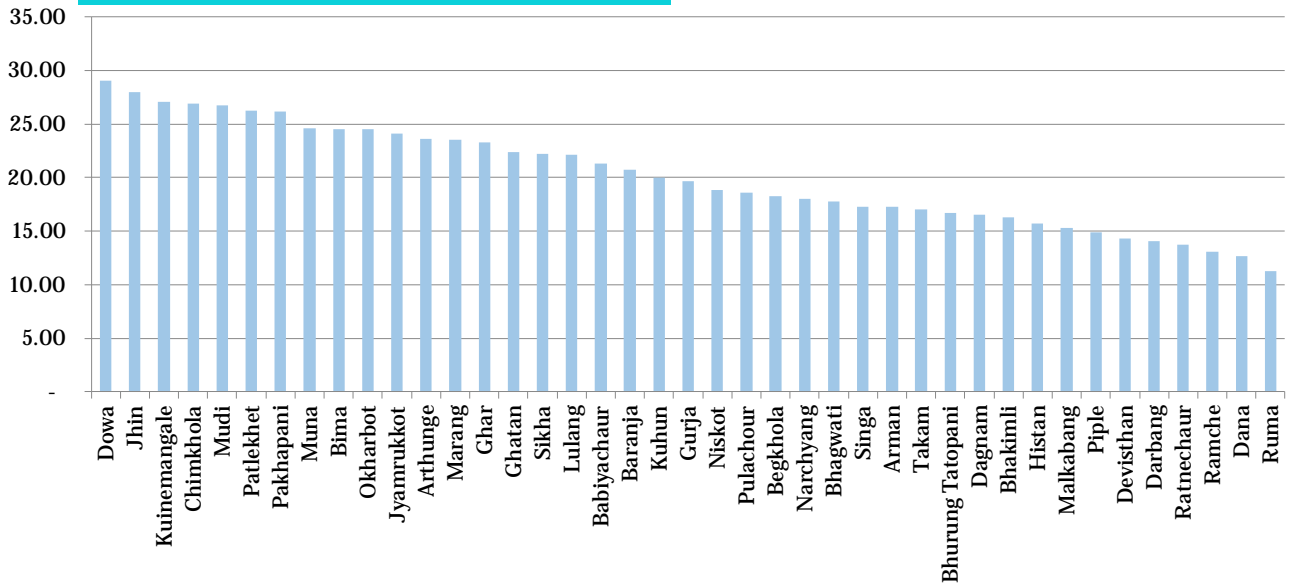
Climate change risk ranking for flood, landslides and water source depletion in different VDCs of Myagdi district (Draft DSWASHP)

ANNEX 4

Indicators of VDC prioritization and their weightage

Drinking water supply facility	Improvement of Toilets	Functionality of water supply scheme	Deprived group	Poverty	Remoteness	Incidence of diarrhoea	Climate change risk
35	25	15	5	5	5	5	5

VDC Ranking with Combined Score



VDC ranking with combined score of different indicators: drinking water supply facility, improvement of toilets, functionality of water supply scheme, deprived group, poverty, remoteness, incidence of diarrhea and climate change risk (Draft DSWASHP).